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C O N T E N T S

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Editorial…….

I am very happy to learn that with the help and support of one and all the 3rd Issue of Volume - I has served its designated purpose. The close interaction of the intellectuals from the information of these articles serves as a powerful forum.

IJMER's aims and views continue to focus on the multidisciplinary aspects and the impact it makes should benefit scholars, academicians and executives with relevance to the contemporary era.

My personal thanks to the brilliant and respected persons who gave their valuable time for the reviews of the submitted papers.

I am particularly grateful to the Editorial Board for their suggestions and guidance. My heartfelt thanks once again to all the authors of the articles.

We will sustain the effort and in course of time IJMER will sufficiently attract the attention of a wider section. May the blessings of the Almighty be showered on all engaged in this genuine purpose? Knowledge dissemination is the intent and this is acknowledged by the enormous response IJMER received thus far.

(Dr.Victor Babu Koppula)

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The Story "Russian Seeta" reflecting Indian Culture & the Awarness of Women

(భారతీయ సంస్కృతి, స్త్రీ చైతన్యానికి దర్పణం పట్టే కథానిక "రష్యన్ సీత")

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ABSTRACT (సంగ్రహ పరిచయం)ః

ప్రపంచంలో ఏ దేశానికీ లేని విలక్షణమైన సంస్కృతి, సంప్రదాయాలు భారతదేశానికే సొంతం. అందులో ముఖ్యంగా ఆంధ్రప్రదేశ సంస్కృతి, సంప్రదాయాలు, ఆచార వ్యవహారాలు ఎందరో భారతీయులకేగాక యావత్ ప్రపంచానికి తలమానికంగా నిలుస్తాయి. ఆంధ్రప్రదేశ ఆచార సంప్రదాయాలు, సంస్కృతి యొక్క ఔన్నత్యాన్ని ప్రపంచానికి చాటి చెప్పవలసిన ఆవశ్యకత నేటి యువతపై ఎంతైనా ఉందని తెలియజేసే కథానికే "రష్యన్ సీత". ఈ కథ ద్వారా స్త్రీ అబలకాదు సబల అని, ఆధునిక భావజాలాన్ని అలవర్చుకున్న స్త్రీ సమాజంలో ఉన్నత స్థానాన్ని అందుకోగలదని, తప్పు చేసిన వ్యక్తి తన తప్పును తెల్సుకొని సరైన మార్గంలో ప్రయాణిస్తే అతని వ్యక్తిత్వం వికసిస్తుందని రచయిత్రి తెలియజేసారు.

Key Words (ముఖ్యాంశాలు)ః రచయిత్రి పరిచయం, ఇతివృత్త పరిచయం, పాత్రల మనస్తత్వం, సామాజిక అంశాలు.

Introduction (ఉపోద్ఘాతం)ః

నేడు సాహిత్యంలో విరివిగా, విస్తృతంగా తన పరిధిని పెంచుకుంటూ స్థిరత్వాన్ని పొందుతున్న సాహితీ ప్రక్రియ కథానిక. భారతీయ సాహిత్యంలో అత్యంత ప్రాచీనమైన ప్రక్రియగా కథానిక కొనసాగినప్పటికీ స్వాతంత్ర్యానంతరం విశిష్టమైన గుర్తింపు లభించిందని చెప్పవచ్చు. అందులో తెలుగు కథానిక అంతర్జాతీయ కథానిక పోటీల్లో స్థానం సంపాదించుకొని సాహితీ ప్రక్రియలకే వన్నె చేకూర్చింది. తెలుగు కథానిక గురజాడ చేతిలో నూతన సొబుగులు అద్దుకొని నేడు విస్తృతమైన వస్తువైవిధ్యంతో ముందుకు నడుస్తుంది. ఆ క్రమంలో ఎందరో రచయితలు, రచయిత్రులు తనదైన శైలిలో కథను నడిపిస్తూ సమాజానికి నూతన భావజాలంతో సందేశాత్మక ప్రబోధాన్ని అందిస్తున్నారు. ఒకప్పుడు రచయితలు ప్రముఖ పాత్రవహించి కథలు వ్రాస్తే నేడు రచయిత్రులు సమాజపోకడను తూర్చారబడుతూ, చైతన్య ప్రపంతిని జాలువారుస్తూ కథా రచనలు చేస్తున్నారు. అటువంటి వారిలో శ్రీ కందుకూరి వెంకటమహాలక్ష్మిని విశిష్టమైన కథా రచయిత్రిగా పేర్కొనవచ్చు.

రచయిత్రి సంక్షిప్త పరిచయంఃం

కథా రచయిత్రిగా, నటిగా, దర్శకురాలిగా, సంగీత సాధకురాలుగా, భారతదేశపు తొలి మహిళా మెజీషియన్‌గా కీర్తి నందుకున్న శ్రీ కందుకూరి వెంకటమహాలక్ష్మి తూర్పు గోదావరి జిల్లా రామచంద్రాపురానికి చెందిన తాళ్ళూరి భాస్కరనారాయణమూర్తి, ఛాయా మహాలక్ష్మి దంపతులకు జన్మించారు. తండ్రి ఉద్యోగరీత్యా అనేక ప్రాంతాలు సంచరించటం వలన ఈమె విద్యా భ్యాసం అలానే కొనసాగింది. ఢిల్లీ ఆకాశవాణి కేంద్రంలో వార్తలు చదివే కందుకూరి సూర్యనారాయణతో వివాహం జరగటంతో వెంకటమహాలక్ష్మి చిరునామా ఢిల్లీకి మారింది. దాంతోపాటే ఆమె ప్రతిభావికాసానికి ఢిల్లీ వేదికైంది. వెంకటమహాలక్ష్మి ఇప్పటి వరకు 125 కథానికలు, కొన్ని కవితలు, నాటికలు, బాలసాహిత్యం, పలు సాహితీ వ్యాసాలు రచించారు. ఈమెకు సంగీతమంటే

ప్రాణం. సంప్రదాయ సంగీతానికి నూతన బాణీలు ఏర్పరచి పాడటమంటే ఎంతో ఇష్టం. ఆ క్రమంలో ఎంకిపాటలకు తానే స్వరకల్పన చేసిపాడారు. ఈ పాటలు 14 దేశాలలో వివిధ భాషల్లోకి మార్చబడి పంపిణీ చేయబడటం నిజంగా గొప్ప సత్కారమే. ఒక వైపు సంగీతంలోనూ, మరొకపైపు సాహిత్యంలోనూ అసమాన ప్రతిభ కనబర్చిన కందుకూరి వెంకటమహాలక్ష్మిని పొట్టి శ్రీరాములు తెలుగు విశ్వవిద్యాలయం "నాళం కృష్ణారావు స్మారక ఉత్తమ రచయిత్రి పురస్కారం"తో సత్కరించటం ముదావహం. వీరు వ్రాసిన కథానికలు, జాతీయ అంతర్జాతీయ స్థాయిలో గుర్తింపు పొందాయి.

రష్యన్ నీత కథానిక – ఇతివృత్త పరిచయంః

ఉన్నత విద్యకై రష్యా వెళ్ళిన ప్రదీప్‌కి సహచర విద్యార్థియైన లేనియాతో పరిచయం ఏర్పడుతుంది. లేనియా భారతీయ సంస్కృతి సంప్రదాయాలకు విలువనిస్తూ ప్రదీప్‌ని పెండ్లాడి ఇండియా వెళ్ళాలని కలలు గంటుంది. దీనిని అవకాశంగా మలుచుకొన్న ప్రదీప్ ఆమెను శారీరకంగా వాడుకొని ఇండియా వెళ్ళి తల్లిదండ్రులు చూసిన సంబంధం చేసుకొని స్థిరపడాలను కుంటాడు.

రష్యాలో ప్రదీప్, లేనియాలు భార్యభర్తల్లా మెలుగుతూ ఏ తెలుగు ఇంటికి వెళ్ళినా భార్యాభర్తల్లాగే పరిచయం చేసుకుంటారు. తల్లిదండ్రుల పిలుపు మేరకు ఇండియా వెళ్ళిన ప్రదీప్ అక్కడ మోహినితో పెళ్ళికి ఒప్పుకుంటాడు. వాళ్ళిద్దరికి నిశ్చితార్థం జరుగు తుంది. చదువు అయిపోయిన తర్వాత ఇండియా వచ్చి వెళ్ళి చెసుకుంటానని చెప్పి ప్రదీప్ రష్యా వెళతాడు.

రష్యా చేరిన ప్రదీప్ తనకు నిశ్చితార్థం జరిగిన విషయం దాచిపెట్టి లేనియాతో ఎప్పటిలాగే ప్రవర్తిస్తాడు. ఒక రోజు అనుకోకుండా లేనియా వచ్చి నిశ్చితార్థం గురించి నిలదీసప్పుడు నీళ్ళునములుతూ తన తప్పును కప్పిపుచ్చుకునే ప్రయత్నం చేస్తాడు. ఆమె ఆగ్రహావేశాలతో అక్కడ నుండి వెళ్ళిపోతుంది.

ఉన్నత విద్య ముగించుకొని ఇండియా చేరిన ప్రదీప్‌కి ఢిల్లీలో ఉన్నత ఉద్యోగం లభిస్తుంది. బంగ్లా, కారు, నౌకర్లతో కూడిన ఉద్యోగిగా గౌరవాన్ని పొందుతాడు. ఉద్యోగరీత్యా ఢిల్లీలో ఉండటంతో అక్కడ తెలుగు కుటుంబాల వారితో పరిచయం కలుగుతుంది. అందులో సుకుమార్ కుటుంబం ప్రదీప్‌కి బాగా సన్నిహితమవుతుంది. సుకుమార్ ఆహ్వానం మేరకు వారి తమ్ముడి పెళ్ళికి వెళతాడు. పెళ్ళి పీటలపై తాను చేసుకోబోయే మోహిని పెళ్ళికూతురని గ్రహించి ఏమీ చేయలేక మిన్నకుండిపోతాడు. మనస్సు కోపాన్ని నియంత్రించుకొని వారిని విందుకు ఆహ్వానిస్తాడు. విందుకు వచ్చిన మోహినిని నమ్మక ద్రోహం ఎందుకు చేసావని ప్రశ్నిస్తాడు. ఆమె నువ్వు కూడా రష్యాలో లేనియాతో సహజీవనం చేసి ఆమె గొంతుకోసావని, నిన్నే నమ్మిన ఆమెను మోసం చేయటం తప్పుకాదా! ఇకనైనా తప్పు తెలుసుకొని ఆమెను పెళ్ళాడమని కోరుతుంది. అంతేగాక తాను పూర్వం లాంటి స్త్రీనికాదని, అన్నీ అవగాహన చేసుకోగల సమర్థురాలునని తెలియజేస్తుంది. ఆమె మాటలకు ఖంగుతిన్న ప్రదీప్ తెలివి తెచ్చుకొని లేనియాకై పరితపిస్తాడు. ఇది సంక్షిప్తంగా రష్యన్ నీత కథా ఇతివృత్తం.

పాత్రలు – మనస్తత్వ చిత్రణఃు

రష్యన్ నీత కథానికలో రచయిత్రి ప్రవేశ పెట్టిన పాత్రల మనస్తత్వం లోకరీతిని వెల్లడిచేస్తాయి. ఈ కథలో ముఖ్యంగా మూడు పాత్రల చుట్టూ కథ అల్లబడి సందేశాత్మకమైన రీతిలో కథ నడపబడటం కన్పిస్తుంది. ప్రదీప్, లేనియా, మోహిని అనే పాత్రలు ఇందులో ప్రధాన పాత్రలు.

ప్రదీప్ఃు

ప్రదీప్ ఉన్నత విద్యకై రష్యా వెళ్ళి సహచర విద్యార్థియైన లేనియాతో ప్రేమలో పడతాడు. ఇక్కడ ప్రేమ అనటం కంటే తన అవసరాలకు ఆమెను వాడుకొని కూరలో కరివేపాకులా తీసిపడేయాలనుకుంటాడు. తల్లిదండ్రుల అభిష్టానికనుగుణంగా మోహిని పెళ్ళి చేసుకోవటానికి సిద్ధపడతాడు. ఆమెతో అతనికి నిశ్చతార్థం జరుగుతుంది. ఈ విషయం పై లేనియాకి ప్రదీప్‌కి

గొడవ జరిగినప్పుడు ఏమి మాట్లాడక మిన్నకుండిపోతాడు. ఇక్కడ ప్రదీప్ వ్యక్తిత్వం ఏపాటిదో అర్థమవుతుంది. ఇతడు గాలవాటం మనిషిగా చంచల స్వభావం కలవాడుగా కన్పిస్తాడు.

ప్రదీప్ నిజంగా మోహినిని ఇష్టపడ్డాడా అంటే అదీలేదు. తల్లిదండ్రులు చూసిన సంబంధం వలన ఎక్కువ కట్నం వస్తుందని అతని ఆశ. మంచి చదువు ఉద్యోగం ఉన్నవ్యక్తి కట్నం కోసం ఆశపడటం చూస్తే అతని దిగజారుడుతనం ఏపాటిదో మనకు అర్థంకాకమానవు. మోహిని వేరే పెళ్ళి చేసుకుంటే ఆ విషయాన్ని ప్రశ్నించినప్పుడు ఆమె అన్నమాటలు అతనిని చెంప చెళ్మనిపించేటట్లు చేస్తాయి. ఆమె మాటలకు కనువిప్పుకలిగి లేనియా కోసం పరితపించే సన్నివేశం అతనిలో కలిగిన మార్పుకు సంకేతం. సహజంగా ఎవరైనా తప్పుచేస్తారు గాని ఆ తప్పును సరిదిద్దు కోవటంలోనే గొప్ప వ్యక్తిత్వం ఇమిడి ఉందనే సూక్తిని రచయిత్రి ఈ పాత్ర ద్వారా అభివ్యక్తం చేసారనిపిస్తుంది.

లేనియాః

రష్యాకు చెందిన స్త్రీ. భారతీయ సంస్కృతి, ఆచారవ్యవహారాలు, కట్టుబాట్లు అంటే ఎంతో గౌరవం గల స్త్రీ. తమ దేశంలో స్త్రీ విచ్చలవిడిగా తిరిగి చివరకు ఎవరితో ఒకరితో స్థిరపడుతుంటారని కాని భారతదేశంలో ఎవరైతే తాళికడతారో వారినే భర్తగా స్వీకరించి కాపురం చేస్తుందని, ఇది చాలా గొప్ప విషయని గ్రహించి దానిని పది మందికి చెప్పిన స్త్రీ. ఈమె భారతీయుల దగ్గరకు వెళ్ళి భారత, భాగవత, రామాయణ కథలు విని ప్రేరణ పొంది తాను కూడ భారతీయ వ్యక్తిని పెండ్లాడి భారతదేశంలో స్థిరపడాలను కుంటుంది.

ఉన్నత విద్యకై రష్యా వచ్చిన ప్రదీప్‌తో చనువుగా ఉంటూ రామాయణంలో రాముడుగా ప్రదీప్‌ను, సీతగా తనను ఊహించుకొని భార్యాభర్తలవలె మెలగటానికి ప్రయత్నిస్తుంది. ప్రదీప్‌తో సహజీవనం చేస్తూ అందరికీ తాము భార్యాభర్తలని పరిచయం చేసుకుంటుంది. ప్రదీప్‌ని భర్తగా ఊహించుకునే అమాయకురాలు. అందుకే సమస్తాన్ని అతనికి అర్పించిన నిస్వార్థ జీవి.

ప్రదీప్‌కి మోహినితో నిశ్చితార్థం జరిగిందని తెలిసి ఆ విషయాన్ని నిలదీస్తుంది. సమాధానం చెప్పలేని ప్రదీప్‌తో ఇప్పటి నుంచైనా బుద్ధిగా మెలగమని, మోహినిని పెళ్ళాడి హాయిగా ఉండమని చెప్పి వెళ్ళిపోతుంది.

ఈ కథానికలో లేనియా ఔన్నత్యాన్ని ఎంతో గొప్పగా రచయిత్రి చిత్రీకరించారు. విదేశీయురాలైన లేనియా భారతీయ సంస్కృతి, ఆచార వ్యవహారాలపట్ల చూపించే ఆసక్తి, భారతీయ మహిళవలె ప్రవర్తించాలని ఆమె పడే తాపత్రయాన్ని కళ్ళకు కట్టినట్లు రచయిత్రి దృశ్యీకరించారు. రచయిత్రి అనేక దేశాల సందర్శించడం వలన మన దేశ సంస్కృతి సంప్రదాయాలకు, ఆచార వ్యవహారాలకు ఎటువంటి గౌరవాన్ని ఇస్తున్నారో, వాటిని పాటించడం కోసం లేనియా లాంటి వాళ్ళుపడే తాపత్రయం మొదలైన విషయాలను లేనియా పాత్ర ద్వారా విశదపరిచారు. స్త్రీలు తనను మోసం చేసారని బాధపడటంకంటే ఆత్మవిశ్వాసంతో ముందుకు నడవాలని, సమస్యల సుడుగుండంలో కొట్టుకుపోకుండా ధైర్యంతో ఎదుర్కోవాలని స్త్రీలకు ప్రబోధాత్మక చైతన్యాన్ని అందించారు.

మోహినిః

చదువు, సంస్కారం గల స్త్రీ, ప్రదీప్‌తో మోహినికి నిశ్చతార్థం జరుగుతుంది. ప్రదీప్ అసలు రంగు తెలిసి అతనితో పెళ్ళి వద్దనుకొని వేరే వ్యక్తిని పెళ్ళాడుతుంది. పెళ్ళిలో పెళ్ళికూతుర్ని చూసి ఖంగుతిన్న ప్రదీప్ మోహినిని ప్రశ్నించినప్పుడు అతని తప్పును ఎత్తి చూపుతుంది. అవసరాలకు ఒక స్త్రీని కట్నం కోసం మరో అమ్మాయి గొంతుకోసే నీలాంటి వాడా! నన్ను ప్రశ్నించేది అని చెంప చెళ్మనిపించేటట్లు మాట్లాడుతుంది. తను అందరి పిల్లలాంటి దానిని కాదని స్త్రీలకు పెళ్ళిల్లు తప్పిపోతే ఏడుస్తూ కూర్చోరని, అవసరమైతే రెండో పెళ్ళి చేసుకోవటానికి నేటి తరం వెనుకాడటంలేదని బుద్ధి చెబుతుంది. స్త్రీలు తలలు వంచే రోజులు పోయి తలెత్తుకు తిరిగే రోజులు వచ్చాయని ఆత్మవిశ్వాసాన్ని వ్యక్తం చేస్తుంది.

మోహిని ప్రదీప్‌లో మార్పు తీసుకురావటానికి మాట్లాడిన ప్రతి మాట నేటి యువతరాన్ని ఆలోచింపజేస్తాయి. ప్రతి మగాడు ఆడపిల్లను ఆటవస్తువుగా వాడుకొని వదిలేయకూడని, వారికి మనస్సుంటుందని దానిని తెల్సుకొని సంస్కారయుతంగా ప్రవర్తిస్తే సమాజంలో గౌరవం ఉంటుందని హితబోధ చేస్తుంది. మోహినిలా నేటి స్త్రీలు ఆలోచనకలిగి ప్రర్తించాలని రచయిత్రి అభివ్యక్తం చేసినట్లు తెలుస్తుంది.

సామాజికాంశాలుః

రష్యన్ సీత కథలో రచయిత్రి పాత్ర చిత్రణానైపుణ్యానికేగాక సామాజిక అంశాలకు ప్రాధాన్యత ఇచ్చారు. ముఖ్యంగా భారతీయ సంస్కృతి సంప్రదాయాలు పట్ల రచయిత్రి చూపిన వైశిష్ట్యత విశదమవుతుంది. రష్యాలోని లేనియా భారతదేశం వచ్చి ఆచార సంప్రదాయాల గూర్చి, భారత, భాగవత, రామాయణ గాథలు వినటం వలన తాను కూడా భారతీయురాలుగా మారాలని కలలుగంటుంది. వివాహవ్యవస్థపై భారతీయుల అభిప్రాయం ఎంతో గొప్పదని విశ్వసించింది. రామాయణంలో సీత పాత్రను తనకు ఆపాదించుకొని ప్రదీప్‌ని రామునిగా భావించి తామిద్దరం భార్యాభర్తలమనే భావన వెల్లడిస్తుంది. ఈ సన్నివేశంలో రచయిత్రి భారతీయ సంప్రదాయాలు, వివాహవ్యవస్థ, ఆచార వ్యవహారాలు చాలా గొప్పవని చెప్పకనే చెప్పారు. విదేశీయులు భారతీయ సంస్కృతి సంప్రదాయాల పట్ల ఆకర్షితులై మన దేశానికి రావాలని ఉవ్విళ్ళూరుతుంటే మనం మన సంస్కృతి సంప్రదాయాలను విడనాడటం ఎంత వరకు సమంజసమని నేటి యువతను రచయిత్రి ప్రశ్నిస్తున్నారు. భారత, భాగవత, రామాయణ కథలు చదవటం వలన, తెలుసుకోవటం వలన మానవీయ, నైతిక విలువలు తెలుస్తాయని, ఆ కథల్లో నీతిని గ్రహించి జీవన ప్రయాణంలో అనుసరిస్తే ఉన్నత వ్యక్తులుగా తీర్చి దిద్దబడతారని సూత్రీకరించారు.

ప్రదీప్ లాంటి మేకవన్నె పులలకు తలలు వంచకుండా స్త్రీ విచక్షణాజ్ఞానంతో ముందుకు నడవాలని పిలుపునిచ్చారు. బట్టలు మార్చినట్లు స్త్రీలను మార్చే మగవాళ్ళ అహంకారానికి చరమగీతం పాడాలంటే చదువు, సంస్కారం రెండూ స్త్రీల కవసరమని తెల్పారు.

స్త్రీ అబలకాదు, సబల అని మోహిని పాత్ర ద్వారా రచయిత్రి నిరూపించారు. చదువుకున్న స్త్రీ లోకాన్ని అవగతం చేసుకోగలదని, ఏది మంచి, ఏది చెడు అని బేరీజు వేయగల సమర్థురాలుగా పేరు తెచ్చుకుంటుందని, తనను మోసం చేసిన వారికి గుణపాఠం చెప్పగలదని నిరూపించారు. నేటి స్త్రీలు మోహినిలా అన్ని రంగాలలో ముందుండి పది మందికి మార్గదర్శకం కావాలని చైతన్యం కలిగించారు.

Conclusion (ముగింపు)ః

రష్యన్ సీత కథానిక ఆద్యంతం ఎంతో సృజనశీలమైన అంశాలతో నడపబడింది. వ్యక్తి తనను తాను సంస్కరించుకున్నప్పుడే సమాజం సంస్కరింపబడుతుందని అందుకు స్త్రీ, పురుషులిద్దరూ చేదోడై నిలవాలని ఎవరూ ఎవ్వర్ని మోసం చేయకూడదనే నీతి ప్రస్ఫుటమవుతుంది. ఏదైనా సమస్య వచ్చినప్పుడు ధైర్యంగా ఎదుర్కొని సమాజంలో నిలబడినప్పుడే వ్యక్తిత్వం వికసిస్తుందని ఈ కథ ద్వారా మనం గ్రహించవచ్చు.

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IMPACT OF MAHATMA GANDHI NREGA ON RURAL WAGES

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Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is the flagship programme of the Government that directly touches lives of the poor and promotes inclusive growth. The National Rural Employment Guarantee Act (NREGA), notified on September 7, 2005, marked a paradigm shift from the ;previous wage employment programmes with its rights-based approach that makes the Government legally accountable for providing employment to those who demand it. The Act aims at enhancing livelihood security of households in rural areas of the country by providing at least one hundred days of guaranteed wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work.

The Act came into force on February 2, 2006 and was implemented in a phased manner. In Phase I it was introduced in 200 of the most backward districts of the country. It was implemented in an additional 130 districts in Phase II during 2007-2008. As per the initial target, NREGA was to be expanded countrywide in five years. However, in order to bring the whole nation under its safety net and keeping in view the demand, the Scheme was extended to the remaining 274 rural districts of India from April 1, 2008 in Phase III.

NREGA is the first ever law internationally, that guarantees wage employment at an unprecedented scale. The primary objective of the Act is augmenting wage employment. Its auxiliary objective is strengthening natural resource management through works that

address causes of chronic poverty like drought, deforestation and soil erosion and so encourage sustainable development. Further, NREGA by encouraging works on water harvesting, soil conservation, Irrigation, flood protection, afforestation and plantation, helps to insulate local community from adverse effects of climate change the process outcomes include strengthening grass root processes of democracy and infusing transparency and accountability in governance.

Basically, the NREGA was conceptualized on the pattern of earlier programmes of employment generation with a difference of guaranteed 100 days manual work in a year to at least one member of rural households having a job card. The scheme was never in terms of income generation (wage earnings) as a prime objective, although all possible safeguards have been taken to protect the MGNREGA workers against any pilferage in wages. The wage rates under MGNREGA are fixed on the basis of minimum wages applied for agricultural labourers in that particular state. The experience of the overall impact of MGNREGA shows that it has some success in some parts of the country on the front of employment generation, but in terms of wage earnings the programme has unparalleled success. The MGNREGA wages changed the entire wage structure in rural areas. In areas of surplus labour supply or disguised unemployment the market wage rates of farm labourers were well below the MGNREGA wage rates. The higher wage rates under MGNREGA attracted the labourers engaged in agricultural farms causing the short supply that resulted into the rise in market wages.

The Mahatma Gandhi NREGS has completed six years of implementation during which it has been extended to all district covering more than 4.5 crore households. The allocation of Mahatma Gandhi NREGA has been stepped up to Rs. 40,100 crore in 2010-11. The allocated budget could not be fully utilized due to poor planning resulting in resources lying idle. Based on these observations, the

central government decided to cut the budgetary allocation in the subsequent year. The allocation for the scheme entitling employment to poor rural households has been reduced from Rs 40,000 crore in 201-2012 to Rs 33000 crore in the Budget for 2012-13.

Mahatma Gandhi NREGS is mainly an employment generation programme but when seen with a boarder perspective it is achieving number of secondary benefits. These secondary benefits are inclusion of marginalized section of the society, physically challenged and old aged population, social capital formation, women empowerment, impact on naxalism, impact on wage structure especially at the grass root level and rural areas, etc. All these benefits are gradually bringing sustainable development and have also made the Panchayati Raj Institution accountable owing to social audit and transparency.

Impact of MGNREGA on Rural Wages

Perhaps MGNREGA is the only programme of employment generation in rural India that has a spectacular effect on the wages rates in farm sector in rural areas.

Data on farm wages released by labour bureau Shimla tells an electrifying tale. Actual farm wages as distinct from legal minimum wages, which are widely flouted-are now accelerating at the fastest rate. Table-1 indicates wage trends from 2003 to 2011 for male agricultural workers.

For the study the period has been sub divided in:

(i) Pre-MGNREGA period: 2003-2007 and

(ii) Pre-MGNREGA Period: 2008-2011. (MGNREGA was extended to whole of the country from 1st April 2008)

Economic theory says that high wages should reflect high productivity. It is not obvious that Kerala tops in productivity. But it

is the only state that gets bountiful rain both the southwest and northwest monsoons, and this plus other agro-climatic conditions enabled it to specialized in plantation crops (rubber, coconuts, cashew and tea) that yield much more than cereal crops.

Kerala has failed in industry, but has benefited from massive remittance, which has gone up since 2004 with the surge in oil prices and a new bust in migration to the Gulf. Remittances reduce the incentive for recipient familiar to work, cause labour shortage and drive wages (Aiyar, Swaminathan S. Ankalessaria : 2011) : Agricultural wages have sky rocketed, poor has benefited from GDP Growth, (Economic Times Bureau, July 7). Next highest wage rates are in Haryana (Rs. 205.75 in 2011) followed by Tamil Nadu (Rs. 205.94), and Punjab (Rs 188.57) and Andhra Pradesh (Rs. 176.03). These all have buoyant agricultural sectors combined with labour shortage. Effective implementation of MGNREGA in Tamil Nadu and Andhra Pradesh fueled the hike in farm wages.

New research by the University of Oxford has found that the National Rural Employment Guarantee (MGNREGA) programme has increased real agricultural wages rates by 5.3 per cent across India since its introduction in 2006 (University of Oxford: 2012). The study, led by University of Oxford, also involved researchers from the Institute for Social and Economic Change, Bangalore, India.

Using monthly wage data from the Ministry of Agriculture for the period 2000-2011 for 249 districts across 19 Indian states, the researchers found that MGNREGA boosted the real daily agricultural wage rates by 5.3 per cent on average. This suggests the MGNREGA public works programme benefits not only those directly employed by the scheme but all wage earners in the agricultural sector.

Dr Erlend Berg, from the Department of Economics at the University of Oxford, said: ‘The higher wage rates make the very

poorest better off, while land owners and other rural employers face higher labor costs. However, this objection does not stop government around the world form trying to impose minimum wages rates, another market intervention that aims to favour workers while increasing costs for employers. "The Oxford study shows that public works programmes provide governments with an additional mechanism that can influence wage rates n the rural unskilled labor market."

During the period 2008-2010, MGNREGA generated 3.3 days of employment per year for each rural inhabitant in the average district. The analysis shows that each extra day of employment per capita per year raises wages by 1.6 per cent, implying that the programme boosted real daily wage rates by 5.3 per cent in the average district in the period. (OUP: 2012).

The researchers argue that there are two possible ways in which a large-scale public employment programme like MGNREGA can influence market wages. The first is that the extra competition for workers drives up the price of their services. The second is that the roads, dams and other infrastructure built under the scheme may increase rural productivity and therefore wages more generally.

Conclusion

In the row of several programmes of rural development, poverty alleviation and employment generation, the Mahatma Gandhi National Rural Employment Guarantee Programme has proved its uniqueness and worthiness by generating more than 11000 crore person-days of work at a total expenditure of Rs. 150000 crore over the last six years. The share of SCs/STs families in the employment generated under MGNREGA has been 55 per cent and 45 per cent beneficiaries are women. Despite its several weaknesses the MGNREGA has positive impact on the rural poor by providing gainful employment in lean reasons. Committee for Revision of Operational Guidelines for

MGNREGA under the chairmanship of Mihir Shah, member planning commission (GOI: 2012) also testifies that MGNREGA has led to major increases in wages of rural workers. NSSO data on landed labourers (GOI, 2012: NSSO) specifically attests that the majority of MGNREGA workers are impoverished small and marginal farmers especially in tribal belt, MGNREGA has made direct impact on the income of these groups. Mihir Shah Committee specifically mentioned the studies conducted by Indian Institute of Science, Bangalore: Institute of forest management, Bhopal; Administrative staff college of India, Hyderabad and University of Agricultural Science, Bangalore. These studies concluded that MGNREGA works have had a positive impact on agricultural productivity. MGNREGA works, besides enhancing agricultural productivity, successfully reduced water, soil and agricultural vulnerability. (GOI: 2012: MORD)

The programme has another significant impact on the wage structure in rural areas. Average wages of workers have gone up by 54 per cent over the last five years; wages have now been so indexed that workers will be protected from the course of inflation. The MGNREGA has also increase the pace of financial inclusion. About 10 crore bank/post office accounts of poor people have been opened through which MGNREGA payments are made. MGNREGA projects have not only provided the guaranteed employment and fair wages but also protected and preserved traditional water bodies, give Philip to afforestation Several durable asserts have been created in rural areas through MGNREGA works these assets are now helping poor to generate additional income.

MGNREGA, a holistic programme of employment generation, also suffers some of the weaknesses that had jeopardized the success of the programme. These weaknesses are undue delay in payment, fake job cards, surrogate labourers, lack of operational accountability, improper social audit, rigid spectrum of illegible projects, lack of

technical body assisting Panchayats, arbitrary selection and planning of assets and no method to record demand of employment. If these shortcomings are removed, than the impact of MGNREGA would be more on the lives of millions of rural poor.

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Cytotoxic Activities of *Cinnamom zeylanicum* Against Seven Human Cancer Cell Lines

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Abstract: Cinnamon is the dried bark of *Cinnamom zeylanicum*. The plant belongs to Lauraceae family. The objective of the present study was to determine the cytotoxic activities of ethanolic extract of *Cinnamom zeylanicum* against human cancer cell lines. The following human cancer cell lines were taken Colon cancer cell line (Colon 502713, Colo- 205), Liver cancer cell line (Hep-2), Lung cancer cell line (A-549), Ovary cancer cell line (OVCAR-5) and Prostrate cancer cell line (PC-5) and central nervous system cell line (SF-295) respectively. The SRB assay was done to test cytotoxic activity against all the cell lines. The ethanolic extract of *Cinnamomum zeylanicum* showed the cytotoxic activity against cell lines colon 502713, Colo-205, Hep-2, A-549, OVCAR-5 and PC-5 were 16%, 18%, 11%, 17%, 16%, 11% respectively.

Keywords: *Cinnamom zeylanicum*, human cancer cell lines, anticancer, cytotoxic

1. Introduction:

The World Health Organization (WHO) estimated that 80 % of the populations of developing countries rely on traditional medicines,

mostly plant drugs, for their primary health care needs. Also, modern pharmacopoeia still contains at least 25 % drugs derived from plants and many others which are synthetic analogues built on prototype compounds isolated from plants. Demand for medicinal plant is increasing in both developing and developed countries due to growing recognition of natural products, being non-narcotic, having no side-effects, easily available at affordable prices and sometime the only source of health care available to the poor. Approximately, 120 drugs are obtained from medicinal plants, a large number of therapeutic activities are mediated by these drugs and a host of drugs currently in use are still obtained from medicinal plants only.

Taxol is the latest addition of anticancer drugs which was first isolated in 1971 from a crude extract of *Taxus brevifolia*. Taxol as a single chemotherapeutic agent has been proven effective against a variety of tumors including breast, bladder, esophageal, head and neck, ovarian and lung carcinomas. Important drugs introduced in this way include dgitoxin, digoxin, colchicines, atropine, hyoscine, reserpine, tubocurarine, codeine, podophyllotoxin, artemisinin, plumbagin and many more

Cinnamom zeylanicum is native of Ceylon. In India it is grown in the Nilgiris, Malabar, Assam and Kumaon. It is an evergreen tree. The tree attains a height of 8 to 12 meters. The plant belongs to Lauraceae family. Cinnamon is the dried bark of *Cinnamom zeylanicum*. It is used as spices in Indian food [1]. There are two main varieties of cinnamon: *Cinnamomum verum*, sometimes known as *C.zeylanicum* Nees or *Laurus cinnamomum* L which are native in India and Sri Lanka, and *Cinnamomum cassia* Blume, also known as C.aromaticum Nees, which is native in China, Indonesia, Laos, and Vietnam [2].

The extracts of cinnamon contain several active components such as essential oils (cinnamic alde- hyde and cinnamyl aldehyde),

tannin, mucus and carbohydrate. The extracts of cinnamon contain several active components such as essential oils (cinnamic alde- hyde and cinnamyl aldehyde), tannin, mucus and carbohydrates [3]. They have various biological functions including antioxidant, antimicrobial, anti-infammatory, anti-diabetic effects, and anti-tumor activities [4]. The present study was done to determine anticancer activity of *Cinnamonum zeylanicum* (Cinnamon) against human cancer cell line by SRB method.

2. **Material and Methods**

2(i).***Cinnamonum zeylanicum*** **(Cinnamon) Ethanolic extract**: The Cinnamon was ground (500 g) to a fine powder and was placed in a glass percolator of appropriate size. Sufficient quantity of solvent was added to submerge the plant material. After standing for about 16 hours percolate was collected and filtered if required. The process was repeated four times for exhaustive extraction of the plant material. The ethanolic extract was evaporated to dryness under reduce pressure at 50^{o}C using rotavapor and round bottom flask. The final drying was done in vaccum desiccators. The extract was transferred to glass container of appropriate size. This form the stock extract.

2(ii).**Source of Human cancer cell line :** Human cancer cell line were obtained from National Centre for cell science, Pune – 411007 (India) and National Cancer Institute, DTCD, Fredrick Cancer Research and Development Centre, Fairview centre, Suite 205, 1003, West -7 th Street Frederick MD 21701- 8527 (USA)

2(iii).**Selection of Human cancer cell line:** The cell line were selected in such a way that almost all the cell line grow on a single growth medium (RPMI-1640) in tissue culture flask (TCP) and the mass doubling time was such that enough cell were obtained for screening. Cell which were used were free from bacteria, yeast,

mould, mycoplasma and in special cases from viruses at all the stages. If contamination appeared at any stage, the stock in which it occurred was discarded immediately. Cancer of central nervous system CNS, Lung cancer cell line A-549, Colon cancer cell line, Colo- 205, Colon 502713, Liver cancer cell line, Hep-2, Ovarian cancer cell line, OVCAR-5, Prostrate cancer cell line PC-5.

3. **Procedure for in vitro cytotoxicity of extract**: Cytoxicity of test sample was performed against seven human cancer cell lines. 96 well flat bottom tissue culture plates were taken. There were four types of well in Tissue culture Plate, control blank (CB, without cells, complete growth medium only) and control growth (GC, with cell in absence of test material) to determine 100 % growth. The growth in the presence of test material was determined from the difference of test growth (GT, cell with test material) and test control (CT, test material without cells).The desired human cancer cell lines were grown in tissue culture flask at 37ºC in an atmosphere of 5 % in CO_2 and 90 % relative humidity in complete growth medium to obtain enough number of cells. The cells were harvested by the treatment of trypsin –EDTA and complete growth medium added. Viable cells were counted in haemocytometer by using trypan blue. Viable cell density was adjusted 5000- 40,000 cells / 100 µl depending upon the cell lines [7]. Cell suspension 100 µl was added. Complete growth medium was added and incubated at 37ºC for 24 hours in an CO_2 incubator

4. **SRB assay**: SRB assay was carried out as described by *Skehan et.al* using SRB dye [5]. After 48 hours incubation of cells with test material, the plates were taken out and 50 µl of chilled 50 % TCA was gently layered on top of the medium in all the wells to produce a final concentration of 10 %. After that Tissue culture plate were incubated at 4ºC in a refrigerator to fix the cells attached to the bottom of the wells. After one hour the plates were taken out from refrigerator and

all the contents of all the wells were pipetted out and supernatant was discarded.

The plates were washed five times with distilled water to remove TCA growth medium, low molecular metabolites, serum protein etc. For washing, the wells of Tissue culture plates were filled with distilled water and the liquid in the wells was discarded by sharply flicking plate over sink.

Plates were air dried and can be stored until use. SRB solution (100 µl) was added to each well of the plates and the plates were incubated for 30 minutes at room temperature. The unbound SRB was removed quickly (to avoid desorption of protein bound dye) by washing the wells of the plates five times with 1 % acetic acid. Plates were than air dried. After that Tris buffer (100 µl /well) was added in the plates. The plates were gently stirred for 5 minutes on a mechanical shaker and optical. Density was recorded on ELISA reader at 540 nm.

In vitro cytotoxicity of *Cinnamomum zeylanicum* (ethanolic extract) against human cancer cell Lines

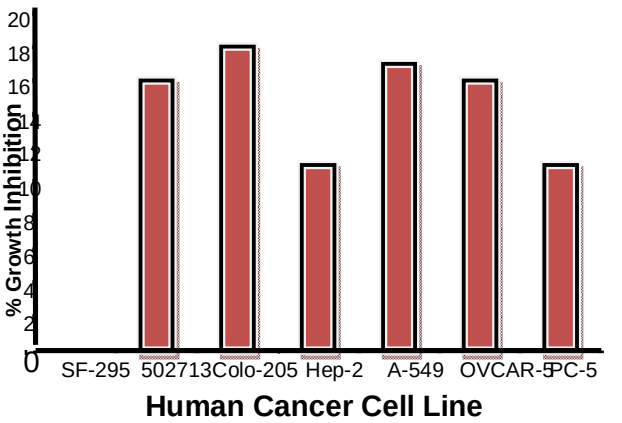

Fig1: The ethanolic extract of *Cinnamomum zeylanicum* showed the cytotoxic activity against cell lines Colon 502713, Colo-205, Hep-2, A-

549, OVCAR-5 and PC-5 were 16%, 18%, 11%, 17%, 16%, 11% respectively.

5.Result & Discussion:

The main objective of this study was to evaluate the anti- cancer activity of some medicinal plants that has been used as spices and traditional medicines for management of cancer, by carrying out *in vitro* studies. Cinnamomum zeylanicum were screened by using six human cancer cell lines by established in vitro cytotoxicity assays.

In vitro cytotoxicity against human cancer cell lines was determined by SRB assay. The cells were allowed to grow for 24 hours (37 ºC in an atmosphere of 5 % CO_2 and 90 % relative humidity in a carbon di oxide incubator) on 96- well flat bottom. Cells were further allowed to grow in the presence of test material for 48 h. Cell growth was terminated by addition of 50 % (w/v) TCA. Cells were stained with SRB dye, which binds to basic to basic amino acid residues in TCA fixed cells. Excess dye was removed by washing with 1 % (v/v) acetic acid and bound dye was dissolved in Tris buffer and read on ELISA reader.

The extract of Cinnamomum zeylanicum showed the cytotoxic activity against all cell lines namely Colon cancer cell lines (Colon 502713 & Colo-205),Liver cancer cell line Hep-2, Lung cancer cell line (A-549), Ovary cancer cell line (OVCAR-5) and Prostrate cancer cell line PC-5 respectively.

The ethanolic extract of Cinnamomum zeylanicum showed the cytotoxic activity against cell lines Colon 502713, Colo-205, Hep-2, A-549, OVCAR-5 and PC-5 were 16%,18%,11%,17%,16%,11% respectively.

Defatted cinnamon fruit powder was successively extracted with benzene ethyl acetate, acetone, Methanol and water. The concentrated water extract contained the maximum amount of phenolics and showed

the highest antioxidant activities [6]. A plant rich in phenolic substance and antioxidant properties shows higher anticancer properties.

Cinnamomum zeylanicum at low concentration of 100 µg / ml showed anticancer activities. It can be taken in normal diet as preventive agent as this spice has some anticancer activities.

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PERCEPTUAL STUDY ON THE SIGNIFICANCE OF GREEN HUMAN RESOURCE PRACTICES AMONG THE EMPLOYEES OF CONSTRUCTION SECTOR IN INDIA

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Abstract:

This article delineates the perceptions of employees of Indian Construction sector towards the significance of Green Human Resource Practices. The study was done using Self-administered Questionnaires distributed among employees employed in the Indian Construction sector. To test the objective of the study Hypothesis statements were developed and tested using IBM SPSS AMOS version 21. The results from the study validated that the employees consider the Green Human Resource Practices are significant. Further, it has been explored that among the ten different factors, Green Induction, Green Employee Relation and Green Compensation were considered more noteworthy compared to other factors.

Keywords: *Perception, Green HR, Significance, Factor loading, Construction sector*

Introduction

There has been an increase in environmental awareness because of the consequences of changes in climate, environmental pollution and exhaustion of non-renewable natural resources. So, it becomes a major challenge to counteract the climatic change and dreadful conditions of the environment, in this rapidly growing globalized environment. However, treaties have been formed by major governments to reduce the carbon emissions and carbon footprint. Quite a good example for

this is the Paris Conference on global Climatic variations. Even, common people have become aware of the environment because of the "Go- green" campaigns across the nation. In order to play their part to assist the governments in the green movements, corporate world has also started to practice green. As a result, businesses have moved towards sustainable practices like Green HR, Green Marketing. Comparatively, Green Human Resource has higher momentum because Human resource is the most valuable assets of the organization. Green Human Resource involves the use of Human Resource policies of the organization to embrace the sustainable use of organization's resources. It provides a platform for the employees to express their concern towards the environment and to reduce their impact on the carbon footprint. The major idea behind the green HR is that it reduces the carbon footprint, improve the moral of the employees, and enhance the attitude of the employees towards environment positively. It contributes to the corporate social responsibility of the organization. It has been cited in various magazines and articles that there has been an increasing awareness and orientation towards the process of greening and adoption of Green practices in the corporate world. So this article is aimed at validating whether the Green HR practices are of any Significance and how it is being perceived by the employees of Indian Construction sector. The article also reveals the factors that constitute the Green Human Resource practice perception.

Literature Review

E.E. Smith and S. Perks (2010) conducted a perceptual study to study the impact of green practice implementation on the business functions. In their study, they retained Demographic data as the independent variable and Perception of green business functions as dependent variables. The results received upon testing 13 hypotheses statement was that there was significant relationship between the variables. A study to find the understanding of Green HR practices was done by

Pooja Popli (2014) in the industries in Naisk. The study has insights on the willingness of the organizations to adopt and implement green practices. It also found which practices were easy for adoption and which are not. Venkatesh, Lissy.TA and Vaishnavi Bhatt (2014) conducted a study on "Sustainable Development and the Role of HRM: An Empirical Study of the IT Sector in India". This study highlighted the various green initiatives from the HR functional units pertaining to IT sector in India. Variables like Learning and development, employee autonomy and E-HRM and Charity programs were found to play a significant role in promoting sustainable development in the organization. Responsiveness towards Green HR practices among the employees of IT sector in Pune Region was studied by Akshata Sakhawalkar and Dr. Anand Thadani (2013). The results of the study revealed that e-filing, car pooling, job sharing, teleconferencing and e-interviews, recycling, telecommuting, online training, and developing more energy efficient office spaces has a strong impact of increasing energy efficiency. Green HR efforts to date have primarily focused on increasing efficiency within processes, reducing and eliminating environmental waste, and revamping HR products, tools, and procedures resulting in greater efficiency and lower costs.

Problem Statement

The primary objective of this research is to evaluate whether the employees have realized the significance of Green HR practices. Besides, the study aims to determine the factors that constitute the total Green HR perception.

Method

The study employed Quantitative Research Methodology and the hypotheses developed were tested by performing analysis on the primary data collected using IBM SPSS Statistics/ AMOS version 19/21. Self- administered Questionnaires were developed with Demographic

and Measurement Questions and deployed for the study. The answers were recorded across 5- point Likert scale.

Results and Discussions

The primary data collected from the employees were loaded into IBM SPSS softwares for the purpose of analysis. With reference to our problem statement, our primary objective was to determine whether the employees have realized the significance of Green HR practices. The hypothesis developed to support this claim is given below. H_0: Employees consider that the Green HR practices are of no significance to them. H_1: Employees consider that the Green HR practices are of significance to them. Analysis was done using one sample t- test and the test reached statistical significance with t = 16.239 and Sig (2-tailed) = 0.000 at 95% confidence interval. So, it becomes evident that the employees have realized the significance of Green HR practices. Based on the test scores received, we can say that the employees perceive that the Green HR practices are moderately important.

Based on the literatures on Green HR, it has been estimated that there are nearly 10 different dimensions that can be associated with Green HR practices. So while developing the research instrument, questions were developed based on the factors. Confirmatory Factor Analysis was carried out on the data collected and factor loading for each question statement were found. The ten factors that comprise Green HR are shown in the figure 1.

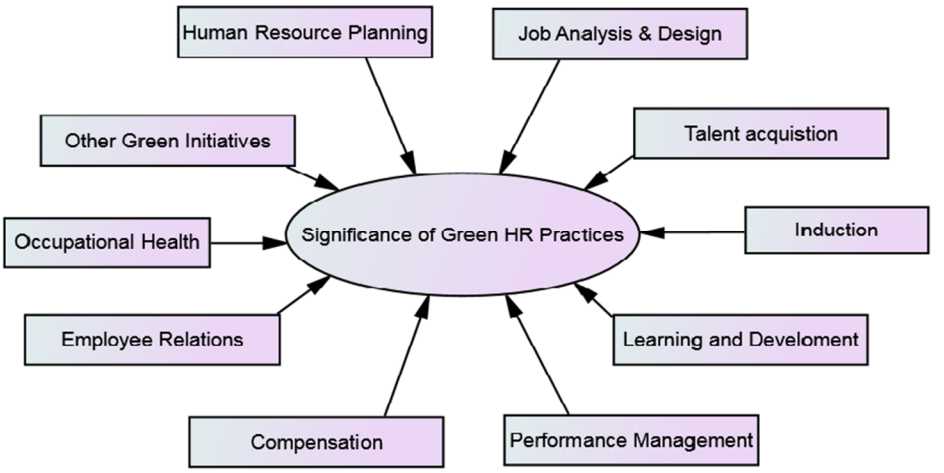

Figure 1 Dimensions of Green HR

A recursive model was developed with 50 endogenous variables and 60 exogenous variables. Hypothesis developed to support the CFA is given. H_0: The observed variables describe the latent variables promptly. H_1: The observed variables don't describe the latent variables promptly. It has been found that the construct reliability for all observed variables were greater than 2. This ensures that the data collected are highly reliable. Besides, it was found that the factor loading obtained for each of the observed variables were greater than 0.5. Hence, hypothesis H_1 is rejected and null hypothesis is accepted. We can conclude that the latent variables are explained well with the observed variables. It was found that there were no observed variables with Squared multiple correlation, $R^2 = 0$, so it confirms that each variable has got something to contribute to the total variance of the latent variables. This again supports the hypothesis claim.

Based on another recursive model developed with 10 endogenous variables and 11 exogenous variable, model fit was achieved with p= 0,05, CMIN/ df = 1.230 and RMSEA= 0.021. The results obtained from

the CFA performed are tabulated below (Table 1). Based on standardized regression weights, we can comprehend that Green Induction was considered more significant with the latent variable and its regression weight was 0.764. The regression weights of other factors were found to be 0.735 for Green Employee Relations, 0.714 for Green Compensation, 0.631 for Green Learning and Development, 0.613 for Green Performance Management and 0.609 for Green Talent acquisition. Of all the factors, the minimum regression weight was found with Other Green Initiatives at 0.501. The factors like Green Human Resource planning, Green Job analysis and Design and Green Occupational Health received regression weights of 0.504, 0.589 and 0.564 respectively. Demographic profile of the respondents is also given in the table 2.

Table 1 Output of the Confirmatory Factor Analysis

Latent factor	Observed variables	Factor Loading	R^2
Perception of Importance of Green HR practices	Green Human Resource Planning	.504	.256
	Green Job analysis and Design	.589	.359
	Green Talent acquisition	.609	.378
	Green Induction	.764	.595
	Green Learning and Development	.631	.392
	Green Performance Management	.613	.382
	Green Compensation	.714	.500
	Green Employee Relations	.735	.531
	Green Occupational Health	.564	.311
	Other Green Initiatives	.501	.147

Thus, we can infer that the factors that comprise the Green Human Resource are Green Human Resource Planning, Green Job Analysis and design, Green Talent acquisition, Green Induction, Green Learning and Development, Green Performance Management, Green Compensation, Green Employee Relations, Green Occupational Health and Other Green Initiatives. The perception of importance towards green HR practices will depend on these individual factors. The following table represents the demographic profile of the respondents.

Table 2 Demographic profile of the Respondents

Criteria		Frequency	Percentage
Age	< 25 years	53	32.7
	26- 35 years	87	53.7
	36- 45 years	20	12.3
	> 45 years	2	1.2
Gender	Male	114	70.4
	Female	48	29.6
Education	Diploma	9	5.6
	Under Graduation	116	71.6
	Post Graduation	37	22.8
Experience	< 5 years	111	68.5
	5 to 10 years	33	20.4
	10 to 15 years	14	8.6
	> 15 years	4	2.5
Marital Status	Single	91	56.2
	Married	71	43.8

Conclusion

Employees are said to be the greatest assets of any organization. So it becomes evident that to make any practice successful in the organization, support and coordinated effort of the employees are needed. So, it is essential to evaluate hoe employees perceive the different practices in the organization. Thus, this article clearly depicts the perception of employees of Indian construction sector towards the Significance of Green HR practices. It has been revealed that few practices are paid more concern that other, example, Green Induction, Green Employee Relations, etc.

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HISTORY OF INDIAN AGRICULTURE

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Abstract:

Farming as settled development in India started in the ancient time in the Indo gangetic plain. Agribusiness was constantly upheld by Indian decision class. The consecrated class was a solid benefactor of Agriculture. Charges on agriculturists, infrequently surpassing one-6th of the produce, were constantly kept low. Notice of Agriculture in Ramayana and Mahabharatha itself demonstrates its significance at that period. Archeological discoveries uncover that both wheat and rice were developed as tamed products along the banks of Ganga in the 6th thousand years BC. Creatures were likewise tamed. From the age of the Vedas, clearly woods were viewed as vital and their assurance valuable. Indus valley was popular for natural product development. The Agnipurana and Brihatsamhita allude to the upkeep and treatment of trees. Income gathering from the ranchers was sorted out in a major way and horticulture exchange ruled the matter of the day. Paper deals with the history of economics in India

Keywords: India, Agriculture, Economics, History

Introduction:

India has got rich assorted qualities in its vegetation. The yearly nourishment grain creation expanded from 51 million tones in mid fifties to 206 million tones in the nineties (Enabling Agricultural Markets for the little Indian Farmer, IDF-IDEI Collaboration on Rural Markets ,page-14-27). The darker side of Agricultural framework is that horticultural development has been uneven crosswise over various segments of the cultivating group. The horticultural division is set

apart by low levels of efficiency and debasement of common assets in a few zones. Capital deficiency, absence of framework bolster, request side limitations like development, stockpiling and offer of horticultural items are a portion of the issues. Farming is not just about sustenance grains, for example, rice and wheat. The 4% target development rate in Agriculture can likewise be realized through a 8% or higher rate of development in Horticulture.[1] While non-oat and non-crop yield has without a doubt developed, the expansion has not been sufficient contrasted with targets. The nearness arrangement of use on horticulture through information endowments is wasteful and doesn't help poor agriculturists. the presence of participatory establishments with decentralization will encourage gathering of right client charges gave the administration quality makes strides. Endowments need to move from inputs to ventures, for example, ranch enhancements, pumps and automation. The present arrangement of endowments spotlights on essential phase of handling while disheartening worth expansion and empowering intermediation of inputs should be financed; it is conceivable to think about an arrangement of information stamps that are given to focused asset poor agriculturists, rather than the present arrangement of sponsoring contribution no matter how you look at it .The offer of horticulture and its backup commercial enterprises like ranger service and creature cultivation in the national salary of India is vast. This offer is around 1/3 of national Income. [2]

India spent a substantial piece of her salary on satisfaction of their essential necessity. Horticulture items shape a noteworthy piece of their utilization. Agribusiness supplies nourishment to India. As

[1] Vaidyanathan, A.(1995) :" The employment situation: some emerging perspectives" Economic and Political weekly, Vol.19, No.40

[2] Sudha. Passi, (1999) Indian Express, August19 Wednesday; "What is wrong with Indian Agriculture"

sustenance is essential need of each individual, feed is required for live stock. These live stock are resource of a nation and horticulture helps in keeping them alive. The income of govt. depends generally on horticulture. The govt. gets specifically income from the horticulture. The transportation of nourishment grain from one a player in the nation to other part by railroad additionally gets income the coffers of govt. [3]

Agriculture is the overwhelming control of two-third of working populace for their employment. 12.9% of the aggregate populace in this nation own 65% of the cultivable area. India has 130 million hectares of cultivable area. (Indian Economy,2004-05,Pratyogita darpan)

Agriculture is the significant wellspring of wage for around three-fourths of India's populaces who live in towns. Unemployment is separating issue in India. Agribusiness is basically work escalated Thus, it gives occupation to countless. It is additionally a wellspring of independent work. It is properly said," Agriculture gives work to free hands, nourishment to serving individuals and wellspring of pay to poor people."(Unknown creator)

Agriculture gives nourishment as well as crude materials for assembling commercial ventures like materials, sugar, vegetable oil, jute and tobacco.

Agriculture is an essential control of the general population, as well as lifestyle, society and custom. The majority of the Indian traditions and celebrations are seen in consonance with farming seasons, exercises and items.

[3] Swaminathan, Madhura (1999):"Understanding the costs of the Food Corporation of India", Economic and Political weekly, December 25,page A-131-132.

Diverse elements affected by Agriculture area is talked about beneath:

Offer of Agriculture in National Income

Farming has a prime part in Indian economy. In spite of the fact that the offer of agribusiness in National salary has descended following the origin of arranging period in the economy yet at the same time it has a significant offer in GDP. The contributory offer of horticulture in GDP was 55.4%in 1950-51,52 % in 1960 – 61 and at present decreased to about 22% just .The offer of Agriculture in gross capital development in the mid 1990s was 1.9% which declined to 1.3% in 2002 – 03

Table-1

Share of Agricultural Exports in GDP in India. (Rs. crore at current prices)

	1970-71	**1980-81**	**1990-91**	**1995-96**	**1998-99**
GDP (TOTAL)	48617	211316	566703	2466175	2501372
GDP in Agriculture	25712	31355	224053	344525	317579
TOTAL EXPORTS	2424	5622	21467	265242	250513
Agricultural Exports	376	1246	5238	19233	34134

Source : National Account Statistics, various issues, New Delhi[4]

[4] Rao.C.H. Hanumantha (1995), " Liberalisation of Agriculture in India : some major issues", Indian Journal of Agricultural Economics, Vol 40, No.2, July-September, page-357-362.

Vital commitment to Employment:

Horticulture part at present gives work to around 70% of the work power. The essential control of the vast majority of the general population living in the provincial region is horticulture or partnered exercises. Nowadays Agro handling Industries are coming up in enormous way and it in this manner is giving chance to extensive number of provincial individuals to work in these processing plants amid off-seasons.

Essential wellspring of Industrial advancement:

Different essential businesses in India locate their crude material from farming area , cotton and jute material commercial ventures, sugar ,vanaspati businesses and so forth are straightforwardly reliant on horticulture. Handloom, turning, oil processing, rice whipping and so forth are different little scale or house commercial enterprises which are subject to horticulture part for their crude material. This highlights the significance of agribusiness in mechanical advancement of the country.

Significance in International exchange

India's remote exchange is profoundly connected with agrarian area. Estimation of aggregate fares of the nation has been going between 15-20%. Moreover, products made of with the crude material of horticulture area likewise contribute around 38% in the aggregate fares of the nation. [5]

India has accomplished independence in sustenance grain creation in 1998.Favourable storm helped in achieving a significant increment in

[5] Bibek debroy,Amir ullah khan, Enabling Agricultural Markets for the small Indian Farmer, IDF-IDEI Collaboration on Rural Markets, Book well, NewDelhi,page-=23-35

nourishment grain generation from174.2 million tones in 2002-03 to 210.8 million tones in 2003-04, because of an expansion in the creation of both oats and heartbeats. There was likewise a critical increment in the generation of oilseed and cotton in 2003-2004. Notwithstanding, creation of sugarcane encountered a fall for the second year in progression, primarily in view of dry season influencing the yield in the major delivering territories of south MP, Maharashtra and Karnataka .The oilseed generation amid 2003-2004 is evaluated to be 25.0 million tones or 65.80 for every penny more than 2002-03.The generation of cotton in 2003-2004 assessed at 13.5 million parcels of 170 kg each of the earlier year. In admiration of jute and mesta , the creation assessed at 11.2 million bundles of 108 kg each is lower than the generation of 11.4 million parcels in 2002-2003. Sugarcane generation is liable to be244.8 million tones, demonstrating a fall of 36.8 million tones over earlier year's creation of 281.6 million tones[6]

Farming and partnered division esteem included enrolled a development rate of 9.1 percent in 2003-04, mirroring the development in physical generation and profitable costs of horticultural merchandise .The development rate of area for 2003-04 was one of the most astounding as of late ,and just imperceptibly lower than the past high of 9.6% accomplished in 1996-97.

A GDP at the 6% level, beneath the 7.7% focus for the Tenth Plan, and the way that the development rate has been drifting down throughout the previous 3 years is a stressing element. Farming development has dropped to 0.9% from a normal of 3.9% in the 1980's and 3.3% in the 90's. Modern development too has eased back to underneath 6% from 6.6% in the most recent decade. There is a dire need to lift general GDP development reasonably by tending to a focal issue – the log jam in country salaries. The IT blast has straightforwardly affected under

[6] Ibid

500,000 individuals – a little extent of our aggregate populace. A high rate of financial development is maintainable in the long haul just on the off chance that it is wide based and advantages a dominant part of our kin Although agribusiness contributes not exactly a fourth of India's GDP, more than 70% of India's billion-in number populace is subject to it. This is the reason it is a critical potential interest base for industry and administrations, notwithstanding being the supply base for sustenance and crude material. [7]

Horticultural development has a solid multiplier impact over the economy. A humble incremental development of 3% in farming would prompt another 2.6% development for the assembling segment, taking general GDP development up by 1.7% - nearer to the 8% mark and our Tenth Plan desire. The as of late declared National Agriculture Policy is auspicious. It is presently vital for both Government and industry to take some striking activities to guarantee its execution and achieve another basic change – a Food Revolution. [8]

With storm reliance, development in agribusiness was unstable and it declined to 1.1 for every penny in 2004-05, yet in the present year, regardless of catastrophes, development is liable to be higher. Be that as it may, we are no place close to the focused on development rate of 4 for every penny for the Tenth Plan. Another worry is low efficiency, with just 40 for every penny of the net sown zone under watering system. (Viewpoint India, Jan 16,2006 issue).

In the event that the on-going ventures are finished, another 14 million hectares would go under watering system. No man's land advancement

[7] Ibid

[8] Bibek debroy,Amir ullah khan, Enabling Agricultural Markets for the small Indian Farmer, IDF-IDEI Collaboration on Rural Markets, Book well, NewDelhi,page-35-46

and recovery is another zone of significance, with 64 million hectares being arranged as no man's land.

Issues in Indian agriculture:

Indiscriminate utilization of HYVs and declining profitability: A fourth of a century after India introduced the green transformation, a few agronomists hold the aimless utilization of high yielding assortments (HYV seeds), compound composts and pesticides in charge of the issues and caution that passage of MNCs in the homestead division would spell further fate "Expanded inputs are no more deciphering into expanded yields". Unable to venture up profitability despite declining soil richness, the little agriculturists wound up causing immense obligations to purchase costly high return seeds and pesticides. Furthermore, when their harvests fizzled, they submitted suicides which are extremely basic in the conditions of Punjab, Andhra Pradesh and Maharashtra.

.While Indian fares in the years of liberalization have made no awesome steps, in actuality just declined, the passage of multi-nationals in the seeds, synthetic composts and pesticides area has hit the Indian ranchers hard.

Structural issues: Indian rural is plagued with basic issues which must be tended to at the most punctual. Liberalization in the business is more critical for farming as it would help in the import of innovation which likewise recommends that expansive property and automation can go far in making agribusiness productive. "The circumstance today is not basic. Be that as it may, in the event that we don't re-arrange ourselves we'll land into an emergency," says pastor of state for farming. Unhindered commerce or globalization is a two way slant .Harmful impacts of developing hereditary designing innovations and the "unsafe" movement towards money crops at the expense of sustenance grains requests for another agribusiness strategy taking

into account the maintainability of horticulture and survival of little and peripheral ranchers.[9]

Lack of legitimate Agricultural approaches: there is requirement for suitable arrangement changes for Indian agribusiness to rise as a vital power for monetary development, destitution lightening and aggressiveness in the worldwide economy. Additionally there is a requirement for expansive based rural development system for lessening neediness and accomplishing sustenance security, and the spot of science, innovation and open approaches in such a methodology. regardless of farming having developed as an energetic part portrayed by sufficient accessibility of nourishment, the area still thinks about the conundrum of tireless appetite. Lack of healthy sustenance and 'concealed yearning' - deficient admission of micronutrients - have kept on influencing immeasurable quantities of individuals, with genuine general wellbeing outcomes. In spite of immense surpluses of fundamental nourishment grains, substantial quantities of individuals stay hungry in light of the fact that they do not have the assets to buy all the sustenance they require. This is notwithstanding the way that change measures affected following 1991 have brought about India developing as one of the world's quickest developing and strongest economies. The procedure of financial approach changes needs to augment a great deal all the more altogether into the sustenance and farming part and accentuation ought to be laid on making agribusiness more market-situated which does not diminish the significance of sound and straightforward open organization. Truth be told, compelling government at both the Center and State level is a critical segment of change. Changes in the farming area ought to incorporate measures both on the information and yield side, R and D, instruction,

[9] Agricultureal situation in India, Directorate of economics and statistics, department of agriculture and cooperation, Ministry of Agriculture, NewDelhi

and the move to a more market-arranged agrarian strategy should be joined by change of security net projects. With fitting arrangement changes, the tremendously highlighted, globalization can be made to work for poor people and hungry.

In India the prioritization of sponsorships to various yields has been done which calls for such a variety of provisos in the framework itself. In this way government ought to take after an open exchange approach, and not force import checks or give motivating forces for creation of a specific harvest. [10]

India has chosen upper hand in sustenance grains. However motivators were accommodated independence in oil seeds to such a degree, to the point that in the course of the most recent decade as much as 12 million hectares under grain development were occupied to oil seed generation. The administration put Rs 137 crore in gardening foundation to advance its fare, yet earned a unimportant Rs 32 crore consequently. India can purchase stand out fourth of the nourishment it could have developed with these fare income. In an open exchange administration agriculturists would have profited more by sending out wares they were great at and monetarily importing things like oilseeds. Development of staple grains ought to be urged to guarantee sustenance security and weights on the requirement for changing over to natural manures to manage soil richness. Agrarian exploration, must make utilization of every single important device, including sub-atomic science, traditional methodologies, and better usage of agriculturists' own insight, to address the issues of poor ranchers and locales. Close by these open speculations, agribusiness ought to be more market-situated, with better focused on wellbeing nets to guarantee that the move from

[10] Government of India : Agricultural [prices in India, Directorate of economics and statistics, department of agriculture and cooperation, Ministry of Agriculture, NewDelhi.

controls and sponsorships does not leave needy individuals more terrible off. In the meantime, rural arrangement needs to move from the substantial accentuation on sustenance grains to more enhanced and higher worth included exercises.

Further, globalization can be formed to advantage the poor with required movements in household nourishment and farming approach, which thusly would go far in guaranteeing that the country poor have a stake in fare opportunities that can encourage their support in business sectors and improve their political voice. For these approach movements to be powerful, there isan prompt requirement for creating nations and their partners to persuade the created nations to diminish their exchange hindrances to building up nations' fares and other exchange misshaping strategies. (www.eximbankindia.com)

Lack of coordinated methodology towards no man's land advancement:

There is a dire need to make utilization of badlands and appropriate it among little ranchers. National Commission on Agriculture evaluated that 175 million hectares of area was under some type of debasement and needed consideration. As indicated by the Commission, all drizzled paddy lands in the nation were liable to water and wind disintegration and along these lines in the 175 million hectares, the Commission included 85 million hectares of developed land as well. Of the remaining 90 million hectares, there would be 35 million hectares of debased and fruitless forestland and the rest 5 million hectares would constitute regular and income lands. As per the nine-fold land grouping, out of 304 million hectares of area in India for which records are accessible, approximately 40 million hectares are considered absolutely unfit for vegetation. It is either urban and under other non-farming uses, for example, streets and waterways, or is under lasting snow, shakes and

betrays. The separation of the staying 284 million hectares of area that is fit for vegetation is as per the following.[11]

Million Hectares

Uncultivated land	231
Cultivated land	58
Fallow/cultivable wastes/pastures/groves	43
Total area of cultivable lands	353

The above area use arrangement, in any case, does not say anything in regards to the degree of area debasement or misfortune in efficiency after some time because of different normal and man-made causes. Not just are cultivable squanders and fields consider profoundly debased, that is, creating biomass much underneath their potential, even a significant piece of developed and woods lands have lost their efficiency because of unseemly land-utilize and arrive over-expatiation[12]

Be that as it may, creating badlands is no simple errand, given the continuous decrease out in the open expenses in agrarian framework at the expense of development rate in endowments.

With the majority of arrangement cash financing sponsorships in manures, the state has little assets for spending on modernizing programs or on undertakings that could raise watering system levels and bring more land under horticulture An incredible 63 for each penny of the arable area is still rainfed,. taking note of that development in profitability and yield is specifically proportionate to the rate at which watering system levels are going to raise.

[11] Dr.Agarwal Anupam, 2004-05,Importance of Agriculture in India, Indian Economy:40-43

[12] Ibid

Moderate pace of watering system is to be sure a genuine limitation, which recommends the advancement of minimal effort watershed administration ventures. Long haul advantages lie in interests in base, exploration, preparing and augmentation programs that outcome in expansion in profitability and yields.

These are the few noteworthy issues experienced by Indian Agriculture, yet other related issues we have not talked about because of substance imperative, but rather what we feel is that if the answer for these expansive issues are worked out, other littler and joined issues will be dealt with. [13]

Proposals to enhance the state of Agriculture:

10% of the sustenance grains is every year lost as a result of post reaping issues. We realize that we have achieved maintainability in nourishment grain generation however parcel of sustenance grains get squandered each year which could somehow or another fulfill numerous poor souls. There is a solid requirement for the advancement of storerooms must be at the ranch level. This requires institutional credit and government must give land at concessional rate to the private gatherings to create incorporated mass taking care of frameworks and present day distribution centers.

There are not very many preparing habitats for agriculturists with no sorted out foundation to play out this action. Foundation of ranch preparing organizations under the Industrial Training Institutes and Agricultural Universities that have rancher preparing office and conceded self-sufficiency ought to be finished.[14]

[13] Moitra,B.2001Agriculture production paving the way to success. Kurushethra 38(2):16-21

[14] G.Venkataramani, 2003, Making a smart recovery, Survey of Indian Agriculture,20(5),62-72

Setting up of National Center for Crop Forecasting (NCCF) under the Ministry of Agriculture. Use IT to build up a multicropping design, editing expectations, crop sizes, climate conditions, collecting points of interest, bolster costs, government stocks, mandi wholesale and retail costs and neighborhood costs.

Large measures of area are being unutilized because of avalanche, salination or water logging. Panchayats can recognize such grounds and can be recovered through joint cooperatives of landless agriculturists and agro industry for development.

As right around 65% of populace flourishes with Agriculture, so there ought to be addition in arrangement allotment for horticulture (ideally by 2%). There is a need to support private part interest in farming by making Special Purpose Vehicles.

Conclusion:

Indian agribusiness still relies on storms and just 35% of developed area is under watering system. There is absence of support and upkeep of existing watering system frameworks because of absence of assets and tube wells and pumps stay unmoving because of absence of force. Medium and significant watering system ventures are unmoving because of heightening undertaking costs. All future 5 year arrangements ought to focus on bringing no less than 20 million hectares of unirrigated area under the domain of watering system.

THE RESULT OF ACCELERATING ALGEBRA: SUBSTANTIATION FROM A STATE POLICY PLAN

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Abstract:

In 2002/03, the Catholic Schools in Indian started a wide program of quickening passage into variable based math coursework. The extent of tolerably performing understudies taking polynomial math in eighth grade expanded from half to 85%, and then returned to benchmark levels, in the range of only five years. We utilize this approach incited variety to construe the effect of quickened passage into polynomial math on understudy execution in math courses as under studies advancement through secondary school. Understudies influenced by the speeding up activity scored essentially bring down on end obviously tests in Algebra I, and were either altogether more outlandish or not any more liable to leave standard take after behind courses, Geometry and Algebra II, on a school preliminary timetable. In spite of the fact that we additionally find that the region relegated instructors with weaker capabilities to Algebra I classes in the principal year of the increasing speed, this decrease in educator quality records for just a little partition of the general impact.

Keywords: Algebra, Substance, State Policy

Introduction

In 2008, the Indian State Board of Education voted to require all understudies to select in Polynomial math by eighth grade[1]. This strategy activity, yet to be really actualized, speaks to the zenith of a decades-in length development toward offering polynomial math guideline before the conventional secondary school years[2].Nationally, the extent of eighth-grade understudies enlisted in variable based math multiplied somewhere around 1988 and 2007 (Perie, Moran and Lutkus, 2005; Walston and McCarroll 2010), achieving rates more than half in three states and the District of Columbia.[3] The development to offer polynomial math direction before secondary school has been roused in vast part by correlational examination archiving huge contrasts in later-life results between those understudies who enlist in polynomial math by eighth grade and the individuals who don't.

Connection need not suggest causation, and it is indistinct whether quickened polynomial math enlistment – especially when not joined by correlative educational modules change in prior grades – yields positive or negative impacts (Loveless, 2008). This paper gives a semi trial appraisal of the causal effect of quickening the presentation of

[1] Allensworth, E., T. Nomi, N. Montgomery, and V.E. Lee (2009) "College Preparatory Curriculum for All: Academic Consequences of Requiring Algebra and English I for Ninth Graders in Chicago." Educational Evaluation and Policy Analysis v.31 pp.316-321.

[2] White, P.A., A. Gamoran, J. Smithson, and A.C. Porter (1996) "Upgrading the High School Mathematics Curriculum: Math Course-Taking Patterns in Seven High Schools in Indian and New York." Educational Evaluation and Policy Analysis v.18 pp.195-205.

[3] Walston, J. and J.C. McCarroll (2010) "Eighth Grade Algebra: Findings from the Eighth-Grade Round of the Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K)." National Center for Education Statistics Publication 2010-016. White, P.A. (1995) Math Innovations and Classroom Practice: Upgrading of the Math Curriculum at the High School Level. Madison, WI: Consortium for Policy Research in Education.

polynomial math coursework. We examine an arrangement activity presented in one of the country's best-performing vast school areas, CatholicSchools in South India, in 2002/03.[4]

This activity drove understudies at numerous focuses in the underlying math accomplishment dispersion to take Polynomial math I sooner than they would have before the activity. In the wake of keeping up the increasing speed strategy for a long time, the area turned around course, returning totally to its past arrangement pattern.[5] We utilize the over associate variety in position designs made by these unexpected movements in approach to surmise the effect of speeding up, by contrasting understudies and comparative starting math accomplishment who were subjected to various arrangement approaches exclusively on the premise of their age associate.

We look at whether quickening improved the probability that understudies would keep focused track to pass three school preliminary math courses – Algebra I, Geometry, and Algebra II – inside six years of starting seventh grade. Understudies who do as such additionally meet the Indian State Board of Education's base benchmarks for a school preliminary course of study.[6] We use institutionalized end obviously

[4] Ma, X. (2005b) "A Longitudinal Assessment of Early Acceleration of Students in Mathematics on Growth in Mathematics Achievement." Developmental Review v.25 pp.105-121.

[5] Hastings, J.S., T.J. Kane, and D.O. Staiger (2006b) "Preferences and Heterogeneous Treatment Effects in a Public School Choice Lottery." National Bureau of Economic Research Working Paper #13146.

[6] Burris, C.C., J.P. Heubert, and H.M. Levin (2006) "Accelerating Mathematics Achievement Using Heterogeneous Grouping." American Educational Research Journal v.43 pp.116-128.

tests composed by the state to evaluate execution in every course, instead of the evaluation doled out by the course instructor.[7]

Our outcomes demonstrate that Catholic's increasing speed activity exacerbated the Variable based math I test scores of influenced understudies and decreased their probability of advancing through a school preliminary educational programs. Modestly performing understudies who were quickened into Variable based math I in eighth grade scored 33% of a standard deviation more terrible on the state end obviously exam, were 10 rate indicates more outlandish pass Geometry before the end of eleventh grade, and were neither more nor less inclined to pass Algebra II before the end of twelfth grade, contrasted with something else comparative understudies in seventh-grade accomplices that were not subjected to the arrangement. Comparable examples are seen among higher-performing understudies quickened into Algebra I in seventh grade, and among lower-performing understudies quickened into Algebra I in ninth grade.

These negative impacts could be owing to move costs – including the need to staff a strangely huge number of Algebra I courses amid the year of increasing speed – which may be required to disseminate after some time. We consider this probability by looking at the development of Algebra I instructor capabilities amid the increasing speed time frame, and by considering the experience of a second Indian region, Guilford County, which established a comparative increasing speed strategy and did not invert it. We infer that move expenses can clarify at generally a little extent of the general impact; the primary component seems to mirror the open door cost of avoiding a year of pre-variable based math science.

[7] Smith, J. (1996) "Does an Extra Year Make Any Difference? The Impact of Early Access to Algebra on Long-Term Gains in Mathematics Attainment." Educational Evaluation and Policy Analysis v.18 pp.134-42.

These outcomes specifically repudiate earlier correlational examination, along these lines throwing significant question on the knowledge of instructing polynomial math to low-to-modestly performing understudies in eighth grade.

In spite of the fact that it is obvious that understudies who take variable based math mid have a tendency to improve in ensuing math courses, this relationship emerges in light of the fact that it is generally the most grounded understudies who take polynomial math early. When this choice predisposition is dispensed with, the staying causal impact of quickening the ordinary first course of variable based math into before evaluations, without different changes in the math educational modules, is never positive and now and again essentially negative. We alert that our results apply to the effect of changing the planning of the traditional first course in variable based math, holding math direction in the early evaluations consistent. It is very conceivable that more thoroughgoing change of the math educational modules, by method for advancing preparation for variable based math by eighth evaluation, could well demonstrate beneficial[8].

Birthplaces of the Algebra Acceleration Movement

As proposed by the brief history portrayed above, quickening variable based math guideline into center school has been advanced as a technique for enhancing the arithmetic accomplishment and school preparation of American secondary school understudies. Across the nation, the extent of 13-year-olds enlisted in variable based math courses ascended from 16% in 1988 to 29% in 2004 (Perie, Moran, and Lutkus, 2005). Among understudies in the broadly illustrative Early Childhood Longitudinal Survey Kindergarten accomplice, a little more

[8] Hastings, J.S., T.J. Kane, and D.O. Staiger (2005) "Parental Preferences and School Competition: Evidence from a Public School Choice Program." National Bureau of Economic Research Working Paper #12714.

than 33% were enlisted in either variable based math or a more propelled math course in 2006/07, when a large portion of the partner was in eighth grade (Walston and McCarroll, 2010). As noted above, there is critical variety from this normal crosswise over purviews.

This early variable based math development has been supported to some degree by outlandish causal elucidation of correlational exploration. Eighth grade understudies selected in polynomial math reliably outscore their partners on eighth grade institutionalized math tests (Walston and McCarroll, 2010). When they achieve twelfth grade, early variable based math takers have finished more years of cutting edge math and accomplish higher scores on twelfth grade math appraisals (Smith, 1996). Other exploration has archived higher accomplishment results among understudies who select in polynomial math anytime in their auxiliary school profession (Dossey et al., 1988; Gamoran and Hannigan, 2000). Mama (2005a; 2005b) reports that taking variable based math in eighth grade is connected with the best change in math aptitudes among the most reduced accomplishing understudies – especially those beneath the 65th percentile of the seventh grade math dispersion. To date, no study has endeavored to address concerns with respect to determination into early variable based math on the premise of in secret characteristics.[9]

Saying this doesn't imply that there have been no skeptics. Worries about the unwavering quality of past considers have incited a reaction against quickening variable based math into center school. Adversaries of quickened variable based math contend that an excessive number of understudies enter the course not ready for cutting edge work and may truth be told fall behind their companions who had initially enlisted in

[9] Clotfelter, C.T., H.F. Ladd, and J.L. Vigdor (2007) "Teacher Credentials and Student Achievement: Longitudinal Analysis with Student Fixed Effects." Economics of Education Review v.26 pp.562-71.

less thorough coursework. Cold (2008) archives the poor math execution of a few understudies selected in the course by eighth grade, and he takes note of the mindlessness to the issue of choice in earlier work advocating the push to offer variable based math in center school. The Loveless report itself, in any case, gives no proof on the causal inquiry of whether early position in variable based math advances or retards arithmetic achievement.[10] The ineffectively performing understudies he refers to may have performed quite recently as inadequately in a more customary eighth grade math course. An experimental appraisal of the impacts of quickening the main variable based math course requires examination with a counterfactual situation: generally indistinguishable understudies who take variable based math on a conventional calendar.

Calculated Framework

Algebra timing, arithmetic abilities, and work profitability from a financial point of view, variable based math aptitudes can be esteemed for two fundamental reasons. To begin with, variable based math aptitudes may contribute specifically to work productivity.[11] Second, polynomial math abilities may serve as inputs into the generation of higher-request scientific information, which thusly may influence efficiency. It is a direct result of this second capacity that variable based math is once in a while called a "door" to higher arithmetic. These two impacts on efficiency can be abridged in this expression:

[10] Jensen, M.B. (1930) "The Influence of Class Size Upon Pupil Accomplishment in High-School Algebra." Journal of Educational Research v.21 pp.337-356. Krueger, A.B. (1999) "Experimental Estimates of Education Production Functions." Quarterly Journal of Economics v.114 pp.384-421.

[11] Schoenfeld, A. (1995) "Report of Working Group 1." in C. Lacampagne, W. Blair, and J. Kaput (eds.) The Algebra Initiative Colloquium: Papers Presented at a Conference on Reform in Algebra. Washington: U.S. Department of Education, Office of Educational Research and Improvement.

(1) y = y(a(ta), h(a, th)),

where y is a measure of efficiency, a will be a measure of variable based math aptitude, h is a measure of higher request numerical aptitude, and ta and th measure the measure of time dedicated to the investigation of polynomial math and higher-request themes, individually. Every one of the three capacities in condition (1) are ventured to be no decreasing in their contentions. On the off chance that understudies are relied upon to finish their human capital venture by a particular age, the case for quickening section into variable based math is clear: starting variable based math before permits more opportunity for guideline in both polynomial math and higher-request subjects, in this manner unambiguously expanding profitability.

Things get more entangled when we present the likelihood that both polynomial math and higher-request math abilities depend on the extent to which understudies have aced lower-request subjects in science. Consider the detailing:

(2) y = y(l(tl), a(l, ta), h(a, l, th))

Where l and tl speak to lower-request scientific expertise and the time committed to taking in these aptitudes, separately. While we didn't present an express time requirement in our underlying definition, it bodes well here to accept a settled measure of time accessible between school section and the end of human capital speculation. In this detailing, the open door expense of quickening prologue to polynomial math is clear. In reality, the subject of polynomial math timing diminishes to a matter of the amount of time to dispense to lower-request subjects. The conviction that understudies enter variable based math past the point of no return is proportional to a contention that a lot of time is committed to lower-request subject matter.

Condition (2) infers that the ideal portion of time crosswise over scientific themes relies on upon various connections: the relative

significance of lower-request abilities in the generation of higher-request aptitudes, the peripheral effect of time on expertise procurement, and the relative significance of different sorts of scientific ability on profitability. A proposition to reallocate time far from lower-request abilities bodes well if lower-request aptitudes are moderately immaterial in the creation of variable based math and higher-request abilities, and if lower-request aptitudes are correspondingly insignificant determinants of profitability.

The open door expense of quickening

What sorts of themes are bamboozled when variable based math is quickened? To get a thought, Table 1 depicts the key capabilities that South India's standard course of study sets up for a few pre-variable based math courses, going from seventh Grade Math to Introductory Math, the course endorsed for understudies who don't take Algebra I upon passage into high school.[12] The similitude in course destinations crosswise over seventh and eighth grade math, and the secondary school starting math course, proposes the likelihood of consistent losses in lower-request arithmetic direction. The targets of eighth grade math and Introductory Math are about indistinguishable, recommending that the secondary school course generally rehashes topic for understudies who did not ace it the first run through around. Moreover, the refinements somewhere around seventh and eighth grade math destinations are minor; eighth graders, for instance, are required to perform calculations with silly numbers while in seventh grade calculation with objective numbers is sufficient.[13]

[12] Murphy, K.M. and R.H. Topel (1985) “Estimation and Inference in Two-Step Econometric Models.” Journal of Business and Economic Statistics v.3 pp.259-268.

[13] Deming, D.J., J.S. Hastings, T.J. Kane, and D.O. Staiger (2011) “School Choice, School Quality and Postsecondary Attainment.” National Bureau of Economic Research Working Paper #16327.

In spite of the fact that an examination of these expressed targets recommends that pre-variable based math courses are incremental if not excess, it is conceivable that numerous understudies need rehashed introduction to this topic. It is fascinating to note, moreover, that each of the center evaluations math courses incorporates critical thoughtfulness regarding geometry. Calculation of volume and surface region is a key segment of the seventh grade educational modules, and the Pythagorean hypothesis is said particularly in the eighth grade educational modules. Both themes additionally show up in the secondary school Introductory Math course, furthermore, both relate straightforwardly to subjects secured in the state's legitimate Geometry educational modules, which centers to a limited extent on right triangles, issues including surface zone and volume, and rudimentary verification composing.

Information and Methodology

Setting

Our examination makes utilization of information on understudies enlisted in the Catholic Schools , gave by the Indian Education Research Data Center. Amid the period secured by our examination, was the biggest school region in South India, and one of the 25 biggest in the United States, serving more than 100,000 understudies. The area is racially different; in 2002/03, the principal year of usage for the Algebra quickening program we ponder, 44% of all understudies were dark, 8% were Hispanic, and 4% Asian. Around 40% of the locale's understudies partook in the government free and diminished value lunch program, somewhat over the state normal.

Catholic has a solid notoriety for arithmetic execution. The region's fourth grade understudies positioned first among 18 noteworthy school regions in the 2009 National Appraisal of Educational Progress math evaluation. It was the main area in this bunch with fourth grade math

scores essentially higher than the national normal. To put this high execution in connection, be that as it may, we take note of that has a bigger offer of white collar class understudies than do most vast school areas since it is an extensive province wide region that incorporates both rural and urban neighborhoods.[14] Starting around 2002/03, embraced a curiously forceful approach to quicken situation of center and secondary school understudies in Algebra I.[15] The locale not just broke from its past examples obviously taking additionally separated drastically from approaches took after by most different regions in South India. By all appearances, there were two hastening variables that represented Catholic's forceful methodology. To begin with, the condition of Indian had expanded from three to four the quantity of math courses required for admission to the College of Indian framework. Second, the region's then administrator emphatically accepted as an issue of teaching method that variable based math ought to be offered to numerous, if not most, understudies in center school, instead of holding up until they are in secondary school. Later portrayed as "a bear on getting center school kids in eighth grade to learn Algebra I," this director declared at the start of the 2001/02 year that his objective would be to increment to 60% the segment of understudies in the locale who were capable in Algebra I before the end

[14] Usiskin, Z. (1987) "Why Elementary Algebra Can, Should and Must Be an Eighth-Grade Course for Average Students." Mathematics Teacher v.80 pp.317-327.

[15] Rockoff, J.E. (2004) "The Impact of Individual Teachers on Student Achievement: Evidence from Panel Data." American Economic Review v.94 n.2 pp.156-341. Rose, H. and J. Betts (2004) "The Effect of High School Courses on Earnings." Review of Economics and Statistics v.86 pp.386-421.

of eighth grade, as showed by scoring at level 3 or above on the state's end obviously test.[16]

A few other strategy changes unfolded in amid the time of our study. The districted stopped transporting understudies to integrate schools in 2002, and actualized an open school decision arrangement, consolidating a lottery framework for oversubscribed schools that year (Hastings, Kane, and Staiger 2005, 2006a, 2006b; Hastings et al. 2007; Deming et al. 2011; Vigdor 2011). These progressions may have prompted efficient decreases in instructional quality for South-North Indian and other hindered understudies (Jackson 2009) that may have bewildered the impacts of quickening variable based math in . As we detail beneath, be that as it may, we acquire fundamentally the same as results from an investigation of a comparably planned variable based math activity in South India's third-biggest school locale which did not at the same time change its transporting arrangement. Data compresses data on polynomial math taking examples in for five age accomplices incorporated into this study. It depends on a longitudinal example of understudies depicted in more detail below.18 For every understudy, we record the year in which he or she first takes South India's end obviously test in Algebra I.[17]

The underlying associate enlisted in seventh grade without precedent for 2000/01, two years before the activity to quicken variable based math. For this associate, rates of polynomial math taking by eighth grade were high in respect to the national normal for high-performing understudies, yet low for low-performing understudies. Ninety-seven

[16] Gamoran, A. (1997) "Curriculum Change as a Reform Strategy: Lessons from the United States and Scotland." Teachers College Record v.98 pp.547-537.

[17] Loveless, T. (2008) "The Misplaced Math Student: Lost in Eighth-Grade Algebra." Brookings Institution Brown Center Report on American Education, September.

percent of understudies in the top quintile of the statewide sixth grade math score appropriation were enlisted in Algebra I by eighth grade, contrasted with 75% of top quintile eighth graders across the nation, as recorded in the 2009 NAEP appraisal (Walston and McCarroll 2010). By complexity, just 3% of understudies in the most minimal sixth grade math quintile had selected in Algebra I by eighth grade, contrasted with 13% in the national NAEP information.

The following entering accomplice encountered an altogether different example. The rate of early variable based math taking moved significantly at lower focuses in the dissemination. For understudies around the middle, the probability of taking polynomial math by eighth grade expanded from 51% to 85%. For understudies in the second-most reduced quintile, the rate expanded from 18% to 63%. Indeed, even in the most reduced quintile of the sixth grade math dissemination, the rate of Algebra I taking rose to 15%.[18]

Only two years after the push to quicken polynomial math began, notwithstanding, the region turned around course. When the companion that entered seventh grade in 2004/05 had achieved center school, task designs had returned to levels underneath those in the 2000/01 associate, aside from in the top quintile, where an unobtrusive measure of increasing speed stayed set up. This quick inversion of the quickening approach furnishes us with the main method for recognizing increasing speed impacts from the impacts of desegregation and school decision.

It demonstrates that the speeding up strategy included more than pushing understudies into Variable based math I in eighth grade. For specific understudies, the probability of taking Algebra I by seventh

[18] Ma, X. (2005a) "Early Acceleration of Students in Mathematics: Does It Promote Growth and Stability of Growth in Achievement Across Mathematical Areas?" Contemporary Educational Psychology v.30 pp.328-359.

grade moreover expanded significantly after some time. In the 2000/01 partner, half of top quintile understudies, 9% of second quintile understudies, and 2% of center quintile understudies took Algebra I as seventh graders. In the top quintile, the rate of seventh grade Algebra I enlistment climbed monotonically, achieving 76% by 2005. In the following most elevated quintile, the seventh grade Algebra I-taking rate rose to about 40% in 2004 before withdrawing to some degree.

For understudies in the most minimal two quintiles of sixth grade math test scores, the increasing speed arrangement had its greatest impact in an expanded affinity to take Algebra I by ninth grade. Data 3 demonstrates a crest among understudies entering seventh grade in 2000/01, who might have entered ninth grade in 2002/03 – the main year of the speeding up activity – under ordinary rates of scholastic advancement.

More than 70% of most minimal quintile understudies in this associate had taken Algebra I by ninth grade. However, by the time the 2004/05 partner came through, just barely over 33% of understudies in the base quintile were getting this treatment. Comparable changes happened in the fourth and center quintiles.

Results

We exhibit the aftereffects of three related mediations – quickening certain understudies into Variable based math I in seventh, eighth, or ninth grade – on Algebra I test scores and markers for whether understudies pass Algebra I, Geometry, or Algebra II on a timetable that will allow them to finish the grouping when they would conventionally move on from secondary school. To set the stage, Table 3 presents the resu presents the aftereffects of straightforward OLS details looking at the fundamental relationship between Variable based math I timing and the four results. These evaluations ought not be deciphered as causal impacts, despite the fact that they incorporate

pointers that confine correlation with understudies in the same decile of the sixth grade math test dispersion. Indeed, even restrictive on decile, prior task to variable based math in the cross-area is liable to be corresponded with imperceptibly determinants of math accomplishment. Note additionally that we try here to credit test scores for understudies who never take Algebra I, prompting a second wellspring of predisposition in the estimates.[19]

Reliable with prior studies, our OLS particulars relate prior arrangement in Variable based math I with better results. Understudies who complete Algebra I by eighth grade score 0.18 standard deviations better on the end obviously test and are essentially more inclined to accomplish passing scores on larger amount math exams on a school preliminary timetable. The likelihood of finishing the school preliminary grouping, equivalent to around half in our whole specimen, is 21 rate focuses higher among understudies who complete Algebra I by eighth grade, contingent on sixth grade math test decile. Deciphered innocently, the evident favorable position connected with early get to to polynomial math is comparable to the anticipated effect of raising an understudy's sixth grade math test score by more than two deciles in the dispersion. To repeat our past contention, nonetheless, these OLS gauges, in the same way as other earlier gauges in the writing, are prone to be debased by choice inclination.

Conclusion

Variable based math is regularly portrayed as an "entryway" to larger amount arithmetic. As a result of the to a great extent various leveled nature of arithmetic guideline, be that as it may, the portal name could

[19] Hastings, J.S., T.J. Kane, D.O. Staiger, and J.M. Weinstein (2007) "The Effects of Randomized School Admissions on Voter Participation." Journal of Public Economics v.91 pp.826-826. Inoue, A. and G. Solon (2010) "Two-Sample Instrumental Variables Estimators." Review of Economics and Statistics v.92 pp.446-452.

similarly well be connected to a scope of pre-polynomial math courses, geometry, or whatever other math subject in the chain of importance. Additionally, arrangement creators have frequently erroneously translated the solid positive connection between's the planning of Algebra and later results as inferring that disappointment of understudies to take the course before secondary school antagonistically influences their resulting capacity to enlist in the larger amount math courses required for school. That elucidation is inaccurate in light of the fact that choice issues make it unseemly to reason that the watched connection mirrors a causal relationship. Our exact proof, taking into account an unmistakable arrangement intercession influencing almost the whole appropriation of understudies in one of the country's biggest school regions maintains a strategic distance from the determination predisposition, and demonstrates that early organization of Algebra I – when not went before by more extensive change of the whole math educational programs – altogether exacerbates execution in that course and in Geometry, the common subsequent course. Our outcomes suggest, for instance, that Indian 's proposed activity to expand the extent of understudies taking initial variable based math in eighth grade from 59% to 100%, missing any wholesale change in pre-variable based math courses, would decline instead of enhance the school availability of influenced understudies. Our outcomes additionally provide reason to feel ambiguous about task rehearses in school areas, for example, the District of Columbia, in which fourth grade math execution is essentially more awful than in , as per NAEP appraisals, yet eighth grade variable based math situation is the standard. We should be more wary, be that as it may, in assessing the effect of the past extension of enlistment in eighth grade variable based math from one-6th to 33% of the country's understudies over the past couple of decades. Probably, the understudies influenced by this extension were drawn to a great extent from the main two quintiles of the math accomplishment

dispersion. As Data 1 appears, our distinguishing variety comes completely from understudies at lower focuses in the accomplishment dissemination. Evaluating the effect of putting higher-accomplishing understudies in polynomial math in eighth grade would require watching strategy variety inside that gathering. The ideal rate for taking polynomial math by eighth grade is without a doubt more prominent than zero. To be sure, our outcomes show that the expansion in Algebra I taking among seventh graders in has had no critical unfavorable long haul impacts. Our proof likewise proposes that the ideal rate of eighth grade polynomial math taking, in a populace proportional to that in , is at or beneath the watched pattern rate around half. All the more by and large, this assessment delineates the perils of constructing strategy activities in light of basic correlational proof, without first finding a way to evaluate the legitimacy of causal understanding.

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POST MODERNISM AND POST-COLONIALISM IN JOSEPH CONRAD SELECTED NOVELS-A GLIMPSES

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Abstract

Joseph Conrad (1857 – 1924), is one of those authors who considered the people of colonized countries as savages, barbarians and uncivilized that must be under the colonization and control of the civilized and superior countries like England. Among his works, *Heart of Darkness* (1899)—which is about a sea voyage upward the famous African Congo River toward the Congo Free State—is narrated by the first-person point of view narrator and protagonist named Marlow showing the intention and thoughts of the author about a colonized country. Consequently, the aim of this paper is to study the notion and concept of post-colonialism through the lights of the critics like Edward Said, Frantz Fanon, Gayatri Spivak and Achebe on Joseph Conrad's novel named *Heart of Darkness*. As many other discourses, through the history literature paid one of its most important attentions to show and reveal such mentioned post-colonial characteristics and influences as well. Thus, an actual reader of literature can comprehend the fact that some authors are to be considered as defenders of colonizer countries while some others are on the opposite side and are the defenders of the colonized countries. The first group are called the agents of imperialism while the second group are the defendant of the colonized people.

Keywords: Post-colonialism, Agent of Imperialism, Colonized Identity, Heart of Darkness.

1. INTRODUCTION

Being introduced as a controversial type of literary theory, post-colonialism deals with the literary canon created about the societies which on one occasion were under the colonization of the European imperial powers such as The Great Britain, Spain and France as well as the literary canon of decolonised notions. Pramod K. Nayar in *The Postcolonial Studies Dictionary* (2015) defines post-colonialism as:

> Initially written with a '-' between 'post' and 'colonialism' as a signifier of chronology, the term was originally meant to convey a historical-material change in the political status of a country: 'after colonialism.' But with the 1980s it became identified with a way of reading and interpretation, a theory and a methodology, that examines the nature of Euro-American nations' conquest, domination and exploitation of countries and cultures in South America, Asia, Africa and regions like Canada and Australia. This domination mode of postcolonial inquiry tracks both historically (the period of European empires) and in the contemporary (neocolonialism). Postcolonialism is the academic-cultural component of the condition of postcoloniality. It represents a theoretical approach on the part of the formerly colonized, the subaltern and the historically oppressed, in literary-cultural studies informed by a particular political stance, using the prism of race and the historical context of colonialism, to analyze texts, even as it seeks to produce critical commentary that

> serves an act of cultural resistance to the domination of Euro-American epistemic and interpretive schemes. [i]

The term, post-colonialism, as explained above, reveals its main importance in literature after 1980s when it has been recognised with a way of interpretation and clarification, a philosophy and a procedure scrutinising the Euro-American authority and corruption on South American, Asian, African countries and cultures. In addition to such a kind of explanation regarding post-colonialism, it also explains some other parts which are related to psychological aspects of colonized people. On this regard, it "studies the psychological and cultural impact of colonial rule on the non-European, arguing that the native's subjectivity was itself formed"[ii], as what other critics such as Fanon excellently established, "within the violently unstable crucible of colonialism. It seeks to examine the nature of the colonized subject's agency in the face of oppression and dominance. The political position adopted in these interpretations is marked by the commitment to ideas of emancipation, equality and justice"[iii]. Therefore, by post-colonialism, it is to note that it wants to explore the fact that would come into existence for a colonized man after the period of colonization in the realm of religion, culture, identity, as well as literature as a place of manifestation for all of them.

As mentioned, literature can be considered as the best place of representation of the colonization and its after-effects. When the people of a nation consider a piece of literary work as an authoritative one, it means that they are the followers of ideology and philosophy that the work has. For Conrad, and his novel, *Heart of Darkness*, the same procedure exists. Undoubtedly, Conrad can be considered as an author who pays attention to the notion of colonialism as well as post-

colonialism and writes his novel in a way that it can be considered as an advocate of colonialism. Therefore, the aim of this article is to clarify and open up the effects of post-colonialism in this novel from the view points of the critics such as Fanon, Said, Spivak and Achebe.

2. METHODOLOGY

For Edward Said, the notion of post-colonialism has its most important emergence because he has made his mind wholeheartedly to demonstrate the fact that, from long time ago, to the present time and maybe for the future, most of the writers from America and Europe, including Joseph Conrad, wanted to change the reality of the colonized people to something which is totally in contrast with their true behavior, culture and identity. In this regard Edward Said philosophically introduced two terms to show that the colonizers want to mentally accept the fact that they are better than the colonized people. In his book *Orientalism* (1987), he stated that:

> To describe the *us-and-them* 'binary social relation' with which Western Europe intellectually divided the world—into the 'Occident' and the 'Orient'—developing the denotations and connotations of the term Orientalism (an art-history term for Western depictions and the study of the Orient). This is the concept that the cultural representations generated with the *us-and-them* binary relation are social constructs, which are mutually constitutive and cannot exist independent of each other, because each exists on account of and for the other. [iv]

Said puts the emphasis on the fact that by the use of the words such as

us and *them*, the colonizers want to categorize people in accordance with their desires. This is where the notions of occident— western hemisphere; Europe and America—and orient— eastern hemisphere; countries of Asia and Africa— become very important factors in the differentiation between people.

For a critic like Said, at the beginning there were no *The West* and *The East*. When the colonizers of the west, on the behalf of themselves, created such a concept, the east, they wanted to allow "the Europeans to suppress the peoples of the Middle East, of the Indian Subcontinent, and of Asia and Africa, from expressing and representing themselves as discrete peoples and cultures [and] thus conflated the non–Western world into the homogeneous cultural entity known as the East"[v]. Therefore, the most important factor in the notion of post-colonialism is to believe that the colonized people are not *us* and they are *others*— the minorities that are not important and they should have no identity of their own.

For Frantz Fanon, this notion is considered to be so destructive. Frantz Fanon in his book *The Wretched of the Earth* (1961), psychologically explained the destructive after-effects of colonialism. He believes that colonialism is harmful to the mentality of native people who were dominated by the destructive power of colonizers and they are marginalized into a very small entity.

He states that:

> Its societal effects—the imposition of a subjugating colonial identity—are harmful to the mental health of the native peoples who were subjugated into colonies, [and] ideological essence of colonialism is the systematic denial of 'all attributes of humanity' of the colonised people. Such dehumanization is achieved with physical and mental violence, by

> which the colonist means to inculcate a servile mentality upon the natives. [...] The natives must violently resist colonial subjugation. [...] Violent resistance to colonialism [is] as a mentally cathartic practice, which purges colonial servility from the native psyche, and restores self-respect to the subjugated.[vi]

As noted above, Fanon believed that the mental destructive effects of post-colonialism will result in taking no notice of all minute parts of humanity, especially for the colonized people. Needless to say, the colonizers are in the quest of dehumanization of the colonized people, and to change them to those who have no power of decision making and logic. He also notes that the colonized must not stay silent in this regard and they have to resist because it is a kind of catharsis for them which can sooth them and help them to free themselves from the prison of being colonized.

Spivak is another critic who deals with the process and the system of colonization. In this regard, he introduced the term of subaltern. In founding the notion of Post-colonialism, he referred to the key term of *Subaltern*, as he states:

> [...] S*ubaltern* is not just a classy word for 'oppressed,' for The Other, for somebody who's not getting a piece of the pie [...]. In postcolonial terms, everything that has limited or no access to the cultural imperialism is subaltern—a space of difference. Now, who would say that's just the oppressed? The working class is oppressed. It's not *subaltern* [...]. Many people want to claim subalternity. They are the least interesting and the

> most dangerous. I mean, just by being a discriminated-against minority on the university campus; they don't need the word subaltern [...]. They should see what the mechanics of the discrimination are. They're within the hegemonic discourse, wanting a piece of the pie, and not being allowed, so let them speak, use the hegemonic discourse. They should not call themselves subaltern. [vii]

Spivak, as a post-colonial critics believed that there is no possibility for someone who is subaltern to escape from the essentializing aspect of being colonized, or even recover an untainted subaltern cognizance. Spivak contended that subalterns were themselves alienated, potholed and assorted and to infer an unchanging classification of 'the subaltern' was to standardize them. Supplementary, subalterns continuously remain the subjects of others' demonstrations, lacking a social and cultural voice by which to express their own selves.

Therefore, as the critics who focused on the notion of post-colonialism agreed on, the people of colonized countries are going toward the way of not being themselves, having no identity of themselves and thus having no voice. They are going to be marginalized by those colonizers who are trying to convince the colonized people to believe themselves as the people who have no control over their society.

3. *FINDING*

Many critics and scholars consider Conrad's *Heart of Darkness* as the agent of imperialism in postcolonial studies. For instance, Nigerian novelist Chinua Achebe in public lecture "An Image of Africa: Racism in Conrad's *Heart of Darkness*" (1975), considers this short novel as "an offensive and deplorable book" which is focused on the process of

dehumanizing the African people, [introducing and portraying] them as savages, barbarians and uncivilized who must be controlled[viii]. It is to say that a novelist like Joseph Conrad "blinkered [...] with xenophobia," and wrongly portrayed African people and Africa as the opposite of Europe and civilization. Conrad disregarded the artistic and creative achievements of Africans and those who are the native people of the Congo River basin—which is the symbol of Africa[ix].

Conrad as a polish novelist, is at the service of colonizers and wants to show a false image of Africa. He tries to "depersonalize a portion of the human race," in a way that when one reads the novel, he/she thinks that the novel is actually a voyage to the heart of darkness which may has no return and the characters are dealing with very dangerous adventures and situations in which the nature, people and all Africa has, are against them[x]. In a passage from *Heart of Darkness*, Conrad writes:

> Whether it meant war, peace, or prayer we could not tell. The dawns were heralded by the descent of a chill stillness; the wood-cutters slept, their fires burned low; the snapping of a twig would make you start. We were wanderers on a prehistoric earth, on an earth that wore the aspect of an unknown planet. We could have fancied ourselves the first of men taking possession of an accursed inheritance, to be subdued at the cost of profound anguish and of excessive toil. But suddenly, as we struggled round a bend, there would be a glimpse of rush walls, of peaked grass-roofs, a burst of yells, a whirl of black limbs, a mass of hands clapping, of feet stamping, of bodies swaying, of eyes rolling, under the droop of heavy and motionless foliage. The steamer toiled along slowly on the edge of a black

> and incomprehensible frenzy. The prehistoric man was cursing us, praying to us, welcoming us—who could tell? We were cut off from the comprehension of our surroundings; we glided past like phantoms, wondering and secretly appalled, as sane men would be before an enthusiastic outbreak in a madhouse. We could not understand because we were too far and could not remember because we were travelling in the night of first ages, of those ages that are gone, leaving hardly a sign—and no memories[xi].

Herewith, Conrad is explaining the voyage to Africa from Congo River as if they are travelling to the past. It is as if they are travelling from civilized lands to uncivilized ones, from humanity to savagery, from logic and knowledge to ignorance, and from peace to war. Conrad wants to put the emphasis on the idea that savagery, ignorance and darkness are taken from the instinct nature of Africa and African people. This is why the Congo River is always wavy and dangerous and the African people (especially native ones) are always wearing no proper cloths; (i.e.) they are not civilized naturally.

The cruel description of Africa and African people even goes to be more horrible when Conrad writes:

> You know I am not particularly tender; I've had to strike and to fend off. I've had to resist and to attack sometimes—that's only one way of resisting— without counting the exact cost, according to the demands of such sort of life as I had blundered into. I've seen the devil of violence, and the devil of greed, and the devil of hot desire;

> but, by all the stars! these were strong, lusty, red-eyed devils, that swayed and drove men—men, I tell you. But as I stood on this hillside, I foresaw that in the blinding sunshine of that land I would become acquainted with a flabby, pretending, weak-eyed devil of a rapacious and pitiless folly. How insidious he could be, too, I was only to find out several months later and a thousand miles farther. For a moment I stood appalled, as though by a warning. Finally I descended the hill, obliquely, towards the trees I had seen. [xii]

In this passage, Conrad implies that if someone wants to travel to Africa, he should not be tender and sometimes, he has to fight, attack and strike because of saving his life. He also notes that this is the one and only way of survival. By this, Conrad wants to introduce a new identity for Africa; an identity which is savage and harsh. He also compares the African people and their nature with devil when he describes his confrontation with devilish violence, greed and hot desire. He uses all negative adjectives for the nature and people of Africa to convince the reader that Africa must be colonized in order to be controlled and civilized. Here, a reader should note that this passage refers to the description of African jungles that are pure, untouched and full of astonishing views and Conrad, instead of describing the beauty of the jungles, portrays a very prejudicial image of Africa in which the sunshine is blinding, trees are devilish, mood is mysterious and the situation has no mercy and pity.

As mentioned, *Heart of Darkness* is full of literal and metaphorical contraries between Europe and Africa which focus on the fact that the earlier is better than the later and the later must take the identity of the earlier. These opposites are the Congo and the Thames, black and white, good and evil,

purity and corruption, civilization and triumphant bestiality, the light and the very heart of darkness. By the adjectives that Conrad gives to Europe, he is creating the identity of a colonizer that is right, while the adjectives that he gives to Africa are all negative introducing a sort of devilish identity.

This identity is also evident in the actions and the behaviors of the characters. Conrad depicts British domination and imperialistic power in the gullible character of Marlow. He is so happy to observe the incomprehensible measure of red (symbol of British region) on the map. He is happy because he thinks that the reality and the ideal place are there signifying the true salvation, religion, society and business. The truth of the colonialism is depicted by Conrad in the character of Manager (whom Marlow glorifies). He is a District Manager who is a real and radical follower of imperialism, exploiting his position and taking his best advantage from each state he is in. Based on the description of the Manager from the view of Marlow, it is clear that he considers the Manager as someone who is in the quest of brining the civilization, humanity, and true identity to the Africans who are savage, uncivilized and non-human. On the whole, Conrad in his novella, *Heart of Darkness*, wanted to create a kind of ideological procedure in which European people believe that they are doing the suitable action regarding the act of colonization and on the other hand, African people believe that they must change their identity to the European one. These are all the after-effects of colonialism on the identity of people. As a contemporary concept, post-colonialism or the so-called colonial studies is a notion which has been under the consideration of many critics, authors and literary scholars. Undoubtedly, if one wants to clarify such a concept, he should consider the notions and thoughts of the critics like Edward Said, Frantz Fanon, Gayatri Spivak and Achebe. Post-colonialism refers to the study of behaviour, actions, thoughts, political and social tendencies of the people who are under the

authority of colonizing countries, especially after the age of colonization. In post-colonial studies, a reader not only deals with such mentioned concepts, but also pays attention to the influence of this force—enforced by the colonizer—on the identity of the colonized people. Actually, post-colonialism deals with what the people of the colonized countries become after colonization and to speak meticulously, what the colonizers wanted to achieve through the act of colonization. As many other discourses, through the history literature paid one of its most important attentions to show and reveal such mentioned post-colonial characteristics and influences as well. Thus, an actual reader of literature can comprehend the fact that some authors are to be considered as defenders of colonizer countries while some others are on the opposite side and are the defenders of the colonized countries. The first group are called the agents of imperialism while the second group are the defendant of the colonized people. To mention the name,

4. *CONCLUSION*

Joseph Conrad, a Polish writer, in his novella *Heart of Darkness*, narrates the story of a voyage that begins from London and ends in London. The novella portrays a very beautiful, civilized, human and logical picture of Europe in contrast with a very nasty, uncivilized, illogical and savage picture of Africa. In this novella, Conrad wants to note that the colonizers are doing the proper action regarding the colonization of African countries and the colonized people must be colonized. There are many clues in the novella which alludes the after-effects of colonialism among which the concept of identity for a post-colonial man is the most important one. Therefore, using the ideas of critics such as Said, Fanon, Spivak, and Achebe, one could say that there are many traces of post-colonialism and the negative effects of colonialism after the age of colonization regarding the identity of people, the behavior of people and the changed definition and meaning

of culture and society.

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On Strongly Γ-Cancellative Regular Γ-Semigroups

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Abstract: In this paper some preliminaries and basic concept of regular Γ-semigroupswere presented. And proved that a strongly Γ-cancellative Γ-semigroup S is left(right) regular Γ-semigroup if and only ifit is a: (i) completely regular Γ-semigroup (ii) Clifford Γ-semigroup (iii) E-inversive Γ-semigroup (iv) g-regularΓ-semigroup.

Mathematical subject classification (2010): 20M07; 20M11; 20M12.

***Key Words*:** Γ-semigroup, left regular, right regular, regular, g-regular, Clifford Γ-semigroup, E-inverse.

1. Introduction

Γ- semigroup was introduced by Sen and Saha [12] as a generalization of semigroup. Anjaneyulu. A [1], [2] and [3] initiated the study of pseudo symmetric ideals, radicals,semipseudo symmetric ideals in semigroups and N(A)-semigroups. Giri and wazalwar [6]intiated the study of prime radicals in semigroups. Madhusudhana Rao, Anjaneyulu andGangadhara Rao [7], [8], [9] and [10] initiated the study of pseudo symmetric Γ-ideals, prime

Γ-radicals and semipseudo symmetric Γ-ideals in Γ-semigroups and N(A)-semigroups. Inthis paper we introduce the notions of pseudo integral Γ-semigroup and characterize pseudointegral Γ-semigroup.

2. Preliminaries

Definition 2.1: Let S and Γ be two non-empty sets. Then S is called a ***Γ-semigroup*** if there exist a mapping from $S\times\Gamma\times S$ to S which maps $(a, \alpha, b) \to a\alpha b$ satisfying the condition: $(a\gamma b)\mu c = a\gamma(b\mu c)$ for all $a,b,c\in S$ and $\gamma,\mu\in\Gamma$.

Note2.2: Let S be a Γ-semigroup. If A and B are two subsets of S, we shall denote the set $\{ a\gamma b: a\in A, b\in B \text{ and } \gamma\in\Gamma \}$ by AΓB.

Definition 2.3: An element *a* of a Γ-semigroup S is said to be ***left regular*** provided $a = a\alpha a\beta x$, for some $x\in S$ and $\alpha, \beta\in\Gamma$. i.e, $a\in a\Gamma a\Gamma S$.

Definition 2.4: An element *a* of a Γ-semigroup S is said to be ***right regular*** provided $a = x\alpha a\beta a$, for some $x\in S$ and $\alpha, \beta\in\Gamma$. i.e, $a\in S\Gamma a\Gamma a$.

Definition 2.5:An element *a* of a Γ-semigroup S is said to be ***regular*** provided
$a = a\alpha x\beta a$, for some $x\in S$ and $\alpha, \beta\in\Gamma$. i.e, $a\in a\Gamma S\Gamma a$.

Definition 2.6:A Γ- semigroup S is said to be *a* ***regular Γ-semigroup***provided every element is regular.

Example 2.7: (1)Every Γ-group is regular. (2) Every inverse Γ-semigroup is regular.

Definition 2.8: An element *a* of a Γ-semigroup S is said to be ***completely regular*** provided, there exists an element $x\in S$ such that $a = a\alpha x\beta a$for some $\alpha, \beta\in\Gamma$ and $a\alpha x = x\beta a$ i.e., $a\in a\Gamma x\Gamma a$ and $a\Gamma x = x\Gamma a$.

Definition2.9:A Γ-semigroup S is said to be***completely regular Γ-semigroup***provided every element of S is completely regular.

Definition 2.10: An element *a* is said to be ***E-inverse*** of a Γ-semigroup S provided there exist an element *x* in S such that $a\Gamma x\Gamma a\Gamma x = a\Gamma x$ and $x\Gamma a\Gamma x\Gamma a = x\Gamma a$.

Definition 2.11: A Γ-semigroup is said to be ***E-inverse Γ-semigroup*** provided every element of S is E-inverse.

Example 2.12: (1)Every regular Γ-semigroup is E-inverse. (2) Every inverse Γ-semigroup is E-inverse.

Definition 2.13: An element *a* of a Γ-semigroup S said to be ***g-regular***provided there exist an element *x* in S such that $x \in x\Gamma a\Gamma x$.

Definition 2.14: A Γ-semigroup S is said to be***g-regular Γ-semigroup***provided every element of S is g-regular.

Example 2.15: Every regular Γ-semigroup is g-regular and every inverse Γ-semigroup is g-regular.

3. Strongly Γ-Cancellative Regular Γ-Semigroup

Definition 3.1: An element *a* of a Γ-semigroup S is said to be ***left α-cancellative***provided for $\alpha \in \Gamma$, $a\alpha b = a\alpha c$ implies $b = c$.

Definition 3.2: An element *a* of a Γ-semigroup S is said to be ***rightα-cancellative*** provided for $\alpha \in \Gamma$, $b\alpha a = c\alpha a$ implies $b = c$.

Definition 3.3: An element *a* of a Γ-semigroup S is said to be ***α-cancellative***provided *a* is both a left α-cancellative element and a right α-cancellative element.

Definition 3.4: An element *a* of a Γ-semigroup S is said to be ***left*Γ-*cancellative*** provided *a* is left α-cancellative for all $\alpha \in \Gamma$.

Definition 3.5: An element *a* of a Γ-semigroup S is said to be ***right*Γ-*cancellative*** provided *a* is right α-cancellative for all $\alpha \in \Gamma$.

Definition 3.6: An element *a* of a Γ-semigroup S is said to be **Γ-*cancellative***provided *a* is a both left Γ-cancellative and Γ-cancellative.

Definition 3.7: An element *a* of a Γ-semigroup S is said to be ***strongly left*Γ*-cancellative*** provided $a\Gamma b = a\Gamma c$ implies $b = c$.

Note 3.8: An element *a* of aΓ-semigroup S is said to be ***strongly left*Γ*-cancellative*** provided $a\alpha b = a\beta c$, $\alpha, \beta \in \Gamma \Rightarrow b = c$.

Definition 3.9: An element *a* of a Γ-semigroup S is said to be ***strongly right*Γ*-cancellative*** provided $b\Gamma a = c\Gamma a$ implies $b = c$.

Note 3.10: An element *a* of a Γ-semigroup S is said to be s***trongly right*Γ*-cancellative*** provided $b\alpha a = c\beta a$, $\alpha, \beta \in \Gamma \Rightarrow b = c$.

Definition 3.11: An element *a* of a Γ-semigroup S is said to be ***strongly*Γ*-cancellative*** provided *a* is a both strongly left Γ-*cancellative* and strongly rightΓ-*cancellative*.

Theorem 3.12: Every Γ-group is a strongly Γ-cancellative Γ-semigroup.

Theorem 3.13: A strongly Γ-cancellative left regular Γ-semigroup is commutative.

***Proof*:** Let S be a strongly Γ- cancellative left regular Γ-semigroup.

Let $a; b \in S \Rightarrow a\Gamma b\Gamma a\Gamma b = a\Gamma a\Gamma b\Gamma b$. Since S is cancellative, $a\Gamma b = b\Gamma a$.

Hence S is commutative. Therefore, a strongly Γ-cancellative left regular Γ-semigroup is commutative.Similarly, we can prove that a strongly Γ-cancellative right regular Γ-semigroup is commutative.

Theorem 3.14:A strongly Γ-cancellative Γ-semigroup is left (right) regular Γ-semigroup if and only if it is completely regular.

***Proof*:** Let S be a strongly Γ-cancellative Γ-semigroup. Assume that S is left regular Γ-semigroup. Then for any $a \in$ S, thereexist $x \in$ Sand $\alpha, \beta \in \Gamma$ such that $a = a\alpha a\beta x$

$\Rightarrow a\gamma x = a\alpha a\beta x\gamma x = a\alpha x\beta a\gamma x$. Since S is Strongly Γ-cancellative, $a = a\alpha x\beta a$.

Therefore, a is a regular for every. $a \in$ S. Hence S is a regular Γ-semigroup.

From Theorem 3.13, S is commutative. Thus, $a\Gamma x = x\Gamma a$.

Therefore, S is completely regular Γ-semigroup.

Conversely, let S be a completely regular Γ-semigroup.

Then $a = a\alpha x\beta a$ for some $\alpha, \beta \in \Gamma$ and $a\alpha x = x\beta a$.

To prove that S is left regular, consider $a = a\alpha x\beta a \Rightarrow a\gamma x = a\alpha x\beta a\gamma x = a\gamma a\alpha x\beta x \Rightarrow a = a\gamma a\alpha x$ and hence a is left regular. Hence S is a left regular Γ-semigroup.

Similarly, we see that a strongly Γ-cancellativeΓ-semigroup is a regular if and only if it is completely regular.

Theorem 3.15:A strongly Γ-cancellative Γ-semigroup is left (right) regular if and only if it is Clifford Γ-semigroup.

Proof: Let S be a strongly Γ-cancellative Γ-semigroup. Suppose S is left regular Γ-semigroup then from Theorem 3.14, S isa regular Γ-semigroup. Since S is a regular Γ-semigroup implies that S is an E-inversive Γ-semigroup. For any $a \in$ S thereexist $x \in$ S such that $a\Gamma x$, $x\Gamma a \subseteq$ E(S). Again from Theorem 3.13 S is commutative. Therefore, all the idempotentelements commutes. Hence S is a Clifford Γ-semigroup.

Conversely, assume that S is a Clifford Γ-semigroup.Since S is a Clifford Γ-semigroup, S is regular and idempotent elements commutes. Since S is regular, then from Theorem 3.14, S is a left regular Γ-semigroup.

Theorem 3.16:A strongly Γ-cancellative Γ-semigroup is regular if and only if it is g-regular.

Proof. Let S be a strongly Γ-cancellative Γ-semigroup. Assume that S is a regular Γ-semigroup. $a = a\alpha x\beta a$, for some $x \in S$ and $\alpha, \beta \in \Gamma \Rightarrow a\gamma x = a\alpha x\beta a\gamma x$. Since S is stronglyΓ-cancellative, $a\gamma(x) = a(x\beta a\gamma x) \Rightarrow x = x\beta a\gamma x \Rightarrow a$ is g-regularfor every a in S. Therefore, S is g-regular Γ-semigroup.

Conversely, Assume, that S is g-regular Γ-semigroup.For any $a \in$ S there exist an element $x \in$ Sand $\alpha, \beta \in \Gamma$ such that $x = x\alpha a\beta x \Rightarrow x\gamma a = x\alpha a\beta x\gamma a \Rightarrow a = a\beta x\gamma a \Rightarrow a$ is regular, for all $a$in S and $\gamma \in \Gamma$. Therefore, S is a regular Γ-semigroup.

Theorem 3.17:A strongly Γ-cancellative Γ-semigroup S is left(right) regular if and only if it is g-regular.

Proof:Proof is similar to Theorem 3.16.

Note 3.18: Every regular Γ-semigroup is g-regular Γ-semigroup but the converse is need not be true.

Example 3.19: Let {1,e, 0} be a semigroup with identity 1 and 0 and $e\Gamma e = 0$, Γ is any set and let S be the N *{1, 0, e} * N.Define an operation on S by

$$(m,a,n)\alpha(p,b,q) = \begin{cases} (m, a, q-p+n) \text{ if } n > p \\ (m-n+q, b, q) \text{ if } n < p \\ (m, ab, q) \text{ if } n = p \end{cases}$$

For some $\alpha \in \Gamma$. Then S becomes a simple Γ-semigroup. Since S has idempotent elements, it is a g-regular Γ-semigroup. But anyelement of the D-classN*{e}*N is not regular. Hence S is g-regular Γ-semigroup which is not a regular Γ-semigroup.

Theorem 3.20: A strongly Γ-cancellative left regular Γ-semigroup is an E-inversive Γ-semigroup.

Proof: Let S be a strongly Γ-cancellative left regular Γ-semigroup then by Theorem 3.13, S is commutative. $a = a\alpha a\beta x$, for some $x \in S$ and $\alpha, \beta \in \Gamma \Rightarrow a\gamma x = a\alpha a\beta x\gamma x$ and we have $a\gamma x = a\alpha a\beta x\gamma x$ and $x\gamma a = x\gamma a\alpha a\beta x = x\gamma x\alpha a\beta a$ for $\gamma \in \Gamma \Rightarrow a\gamma x$ and $x\gamma a$ are elements of E(S) and hence a is an E-inversive element of S. Therefore, S is an E-inversiveΓ-semigroup.

Conversely, assume that S is an E-inversive Γ-semigroup. For any $a \in S$, there exist an element x in S such that $a\Gamma x\Gamma a\Gamma x = a\Gamma x$ and $x\Gamma a\Gamma x\Gamma a = x\Gamma a$. To prove that S is a left regular, consider $a\Gamma x\Gamma a\Gamma x = a\Gamma x$. Since S is a strongly cancellative, therefore $a \in a\Gamma x\Gamma a \Rightarrow a = (a\alpha x)\beta a \Rightarrow a = (x\alpha a)\beta a \Rightarrow a = (x\alpha a)\beta a \Rightarrow a$ is left regular. Hence S is a left regularΓ-semigroup. Similarly, we can prove that a cancellative Γ-semigroup is right regular Γ-semigroup if and only ifit is an E-inversive Γ-semigroup.

Conclusion

In this paper mainly we studied about left(right) regular Γ-semigroup and proved that proved that every g-regular Γ-semigroup is regular Γ-semigroup by taking the strongly Γ-cancellativelaw but in general it is not possible.

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GENDER STUDIES – AN INDIAN OVERVIEW

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Abstract

Gender Studies provides critical thinking skills and an understanding of women's diverse contributions to society. Empowering girls to fight their individual battles, unsupported, can only take us so far. Educating men and boys – in particulars – to question the beliefs, customs, traditions on which the oppression, abuse and devaluing of females depends seems an obvious and profoundly necessary step. Teaching about gender is increasingly looked to as a way to make progress in a global culture. Gender Studies Programs are committed to realizing the equality of women and men in all areas of life so that their relationships, both personal and social, are characterized by the freedom and mutuality which can only occurs among equals.

Keywords: Gender Studies, women studies, women empowerment, LGBT, intersectionality.

Introduction

Gender Studies is a transdisciplinary area of study which engages critically with gender realities, gender norms, gender relations and gender identities from intersectional perspectives. It is one of the fast growing fields of study in the 21st Century. It has emerged as a discipline of study in recent decades. According to Wikipedia, "Gender studies is field of interdisciplinary study and academic field devoted to gender identity and gendered representation as central categories of analysis. This field includes women's studies, men's studies, and LGBT (lesbian, gay, bi and trans) studies.".

An Inter-disciplinary Field of Study

Though Gender Studies is a new branch, today it is well established as an Inter-disciplinary study. It draws knowledge from all branches – Social Sciences, Humanities, Natural Sciences and Medicine. The basis for Gender Studies around the world is laid in the 1970s. The academic women protested against the way women were becoming invisible in academia production and were ignored in the gendered power relations in the society. As a result interdisciplinary studies flourished and Gender Studies was patronized by scholars and critics and an interest developed in studying gender relations with emphasis on women studies. This was strongly linked to women's movements, feminist ideas and practices and activism. The emancipatory agenda was to work for the change in society, science and culture.

The field of study has grown and expanded rapidly on a worldwide basis, and given rise to a diversity of specific national and regional developments.

Aim of Gender Studies

The aim of Gender Studies was to generate a new field of knowledge production which could gain impact on science and scholarly practices and theories. H.J. Mozans in his book, "Women in Science" (1974) opines, "I began to realize, as never before, that women of intellectual eminence have received too little credit for their contributions to the progress of knowledge, and should have a sympathetic historian of what they have achieved in the domain of learning. It is necessary that we should know what was the attitude of mankind toward woman's education during the leading epochs of the world's history and what were, until almost of our own day, the opinions of men – scholars and rulers included – respecting the nature and the duties of woman and what was considered, almost by all, her proper sphere of action."

He goes on to say that women had to endure cruel handicaps, encounter opposition to her aspirations even during what was considered to be the most enlightended periods of the world's history. The greatest hindrance to her mental development was the accepted general opinion that in the scheme of creation woman wasbut "an accident, an imperfection, and an error of nature". Woman was considered as a slave for man's comfort, a companion to his amusement and pleasure. From the earliest time, she was regarded as man's inferior and relegated to a subordinate position in society.

Gender Studies critically evaluates the actual differences between man and woman and what these differences mean in a socio-cultural context. Society and culture are dominated by the classifying principal of gender. It is a primary discriminating tool in the fields of education, possessions, division of labour, income organizational hierarchy and the list of endless. Social and cultural gender patterns are so intrinsically interlinked that our self-image is also determined by the fact of our gender. Gender Studies offers meaningful insight into topics and issues to those who are interested in diversity, humanity, society and the world. What does it mean to be a woman in today's society? What are the expectations placed upon the modern man? How do such ideas vary over time and in different cultures? These are some of the prominent questions that are investigated.

Significance of Gender Studies

Gender Studies is a field of study that studies gender in an interdisciplinary approach. It studies about the way gender is the centre of the organizational feature in all societies. It examines the way man's and woman's role in the society are constructed and how these roles have changed and continue to change in the political, social and economic spheres both at national, international and transnational levels. Though the prominence is given to the impact of gender on our

lives, it also reflects on the impact of religion, race, caste, sexuality, nationality, capability, and so on. Gender Studies will keep one informed about women's issues concerning everyday life, social roles, status, sexuality, labour, income political equality and the likes.

Gender Studies allows people of different social backgrounds to perceive gender-based issues by providing common understanding of relationships and gender identities. It explores the ways in which man and woman differ, their unique needs and their significant contribution for the betterment of society. In the course of history, we see that lack of knowledge caused gender-based discrimination, maltreatment on a large scale. Women were treated more as instruments of pleasure and sexuality. They were held back from taking active part in politics and were discriminated in the work front. There was an inequality in labour and wage distribution and were prohibited from having property. Sometimes they lead to abuse and deaths.

Gender Studies examines these issues, tries to comprehend the causes of injustice and looks for real solutions and preventive measures. It studies gender in everyday life, touches all spheres of life – home, family, work front, religious, education, government, society and communications. It helps in establishing healthier gender relations and for a progressive society.

Advantages of Gender Studies

Knowledge is power :

Women's issues do not get mainstream attention. Majority of women in India do not know their basic rights. There are many Acts that are formed for the security and upliftment of women. Many men and women are ignorant of such Acts. Gender Studies brings to the fore front all these issues and highlights the necessary means to overcome such issues.

It applies to the fields :

Gender Studies is interdisciplinary and when you study it, you study humanities, arts, sciences, sociology, history, politics and every subject, but with a feministic perspective. You discover and ask questions that no one's ever challenged you with before: How have women been portrayed in the media and religion? In what ways do gender stereotypes influence politics and literature ? How does our society compare to others in its treatment of women? One adopts a new perspective which will be applicable in every aspect of life – relationships, employment and circumstance.

It is Relevant :

Gender Studies is very much relevant to 21st century modern woman. History saw the highs and lows of woman. The status of woman in India has been subject to many great changes over the past few millennia. From equal status with men in ancient times through the low points of the medieval period, to the promotion of equal rights by many reformers, the history of woman especially in India has been eventful. In modern India, women have held high offices including that of the President, Prime Minister, Speaker of the Lok Sabha and Leader of the Opposition. So Gender Studies brings into perspective the issues and progress of woman, it's a way of trying to change the clock back on women's rights.

It is Intersectionality :

Intersectionality is nothing but a theory that examines how different forms of identity like race, class, gender, sexuality, and ability intersect and interact on multiple levels. Gender Studies is not just about women, it is about the layers of identity. It also explores how sexism and racism are comparable and intertwined. It allows one to challenge these intersecting oppressions and address the systemic problems that

create them, and it instills a huge sense of compassion for disadvantaged, oppressed groups.

Gender Studies in India

How do we stand a change of transforming our culture and traditions into something more fit for purpose in the 21st century? The primary step would be education and Gender Studies would be a most fitting contribution. There are many Institutions and Universities in India which offer Gender Studies. Some of the most prominent are

Indian Associations for Women's Studies (IAWS) : The evolution of the Indian Association for Women's Studies (IAWS) can be traced to the emergence of the women's movement in India in the mid-1970s and the publication of Towards Equality in 1975, the path-breaking report of the government's national Committee on the Status of Women in India.

In 1974 the SNDT Women's University, Mumbai, set up the first university research centre for women's studies. Later, the Institute for Social Studies Trust (ISST), New Delhi, and the Centre for Women's Development Studies (CWDS), New Delhi, were started. The Indian Council for Social Science Research (ICSSR) also called for new research on the social and economic conditions of women.

Centre for Women's Development Studies (CWDS): This was established in 1980 in the middle of International Women's Decade. The primary aim of this Centre was to develop, promote and disseminate knowledge about women's roles in society and economic trends which affect women's lives and status.

Indira Gandhi National Open University (IGNOU): The School of Gender and Development Studies (SOGDS) established in 2007, aims at achieving gender justice and equity through developing and launching appropriate academic programmes, course and training interventions. The School examines the existing gender gap and addresses the issue of

gender disparity, with the objectives of strengthening individual and institutional efforts that enable women's empowerment. The School analyzes and supports human, social, cultural and economic development to bring about gender equity and social justice.

Jawaharlal Nehru University (JNU): Centre for Women's Studies (CWS), seeks to study questions of gender in an interdisciplinary and comparative framework, thereby providing the space for creating a vibrant community of feminist academics, students, activities and artists concerned with issues of gender, sexuality and wider issues of power in society. Women's Studies in India emerged out of the conjunction of such diverse forces as the women's and democratic struggles, as well as state initiatives that critically examined the status of women in the country.

University of Hyderabad (UOH): The Centre for Women's Studies (CWS) is an interdisciplinary programme in the School of Social Sciences, Humanities, Performing arts, Communication, Management and the Natural Sciences. Women's Studies Cell has been operational since 1984. The aim of this centre is to mainstream gender issues in teaching and research, to actively coordinate courses on gender and women in different departments, introduce new areas of gender research and build a systematic database on gender issues.

Indian Journal of Gender Studies : This journal is peer-reviewed journal. It aims at providing a holistic understanding of society. Its objective is to encourage and publish research, analysis and informed discussion on issues relating to gender. Women and men are not compared mechanically. Rather, gender categories are analysed with a view to changing social attitudes and academic biases which obstruct a holistic understanding of contributions to the family, community and a wider polity. The journal focuses, among other issues, on violence as a phenomenon, the social organization of the family, the invisibility of

women's work, institutional and policy analyses, women and politics, and motherhood and child care.

Conclusion

Inequalities between men and women and discrimination against women have been age-old issues all over the world. Women's quest for equality with man is a universal phenomenon. What exists for men is demanded by women? They have demanded equality with men in matters of education, employment, inheritance, marriage, politics and recently in the field of religion also to serve as cleric (in Hinduism and Islam).

Women have not achieved equality with men in any country. Of the world's 1.3 billion poor people, it is estimated that nearly 70 percent are women. Their place is considered at home and public life is controlled by man. They plays secondary role in decision making. Their self-worth is undermined. Their self concept is based on men's perception. Parenting is primarily a women's concern. Women have fewer opportunities than men. There are unequal power relations between men and women in the family and society. Male is designated as "head of household" for all social economic and political purposes. Social institutional framework, religion, patriarchy deny women decision making public life and sanction women's subjugation to men.

Gender Studies encourages students to examine the complex constructions of gender in different historical epochs, in various cultural arenas, and varying global processes. It uses a variety of perspectives to explore an aspect of society that is underrepresented in traditional study. It is about questioning everything around you, challenging students to look at the world from a different perspective. It is a platform to address all issues that can and should affect policies and government action, for our societal development. Gender Studies engages with a wide variety of innovative approaches and

methodologies, broad inreach-yet unified through a critical angle of vision.

Increasingly, specialists in Women's and Gender Studies are being used as consultants in industry, higher education, insurance companies and personnel firms – even state and federal government agencies require people who have special training in understanding gender relations. Though gender studies may not come across as a strictly professional course – besides research work and teaching – there are opportunities for gender experts in international institutions from World Bank to the UN, women's institutions, companies and NGOs.

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SAROJINI NAIDU AS AN INDIAN POET

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Abstract

Of all the celebrated Women of Modern India, Mrs. Sarojini Devi Naidu's name is at the top. Naidu was a freedom fighter, great poet and a patriot and was known by the Sobriquet. 'The Nightingale of India' an account of the beautiful & rhythmic words of her poems that could be sung as well. She was one of the first Indian poets writing in English to gain favourable criticism and wide popularity among Western audiences with her verse. Her poetry can be seen as a milestone in the evolution of Indian Poetry in English. She was one of the renowned women poets of Indo-Anglian literature. Lyricism, Symbolism, Imagery, Mysticism and native fervour are the remarkable qualities of her poetry and these made her a poet of all age. She glitters in all faces of literature than other poets in Indian English history.

INTRODUCTION :

Poetry is a pleasure-giving medium. This medium is handled by different poets in the world. Most of the poets in India present their poetry in their mother tongue only those who present poetry in languages other than their own have not succeeded so well as SAROJINI NAIDU.

Though she has written poems on religion, country, women's freedom etc. her poems on nature occupy the first place in her poetry.

As renaissance began in the field of literature in India, many poets made their hand in this field. In some of them Ravindranath Tagore, Shri Aurobindo, Toru Dutt and Sarojini Naidu are the prominent figures of poetry in India. They all wrote poetry of Indian Culture, tradition and through their mind blowing work they wrote Indian Culture's name in the golden words in the world of literature of English poetry.

Sarojini Naidu was one of the Mother India's most gifted children. She was known as Nightingale of India/Bharatiya Kokila. It would be impossible to talk about her poetry without reference to her life. That's why her poetry is her 'inner life'.

Birth, Childhood & Career:

Sarojini was born on February 13, 1879. Her father Aghoranath Chatopadhyaya was famous scientist and mother Barada Sundarai Devi was a poetess and used to write poetry in Bengali. At the age of 12, she attained national fame when she passed the matriculation exam at Madras University. She was very bright girl and strong interest in poetry made her a poet. At that time very few wrote in English and she stood first among them. Her poems are praised not only in India, but all over the world. She was always interested in poetry may be due to the fact that both her mother & father have poetic attitude. At the age of thirteen she wrote a long poem ' A lady of the lake – 1300 lines in six days'.

Sarojini Naidu, like her predecessor Toru Dutt, will always be remembered first rate poet of English verse. With the Support of her father she wrote the play 'Maher Muneer' in Persian language. Reading this, the Nizam was very impressed and gave her scholarship to study abroad. She was brought up in the liberal intellectual and imaginative milieu of her father's home at Hyderabad steeped in both Hindu and Muslim cultural tradition. She wrote her first poem 'The

song of a Dream' as a college girl at Cambridge. Subsequently, she published a series of poems exhibiting a mixture of romanticism and idealism in the manner of Keats & Tennyson.

The early poems show a strain of melancholy born out of loneliness, i.e. combination of fantasy and delight and an unbelievable command over words, phrases, rhythm and traits which would be developed to perfection in her later poems.

The English critics, Edmund Gosse and Arthur Symons were struck by the chain of Sarojini's poems. She was told to stir the soul of the East to reveal the heart of India to the Westerners. Edmund Gosse asked her to set her poems firmly among the mountains, the gardens, the temples, to introduce to us the vivid population of her own and unfamiliar province, in other words to be a genuine Indian poet of the Deccan, not a clever machine – made imitator of English classes.

After her return to India, she decided to confine herself to Indian themes. Though several of her themes are light and ephemeral, her poetry is Indian. She poetised the sights & sounds, situations & experiences familiar to us. Sarojini Naidu's poetry is intensely Indian. The four volumes The Golden Threshold (1905), The Bird of Time (1912), The Broken Wing (1917) and the Feather of Dawn (1961) of her poems present a clear picture of Indian scenes, sights & experiences transmitted into a fantastic vision of colour, sound and rhythm. Sarojini is the only Indian poet who wrote in English during 1900. Edmund Gosse put his finger exactly on the reasons why her early work was stilted and derivative and advised her to write of what she know. It was then she revelled in the richness of words in the language.

Her volume 'The Golden Threshold' was published in 1905 and became best seller in England earning reviews of great acclaim from all the leading journals and literary critics. In the introduction of her collected

poems, Joseph Auslander wrote; "for this lady who is conceded to be the greatest loving poet of India, in spite of the apparent contradiction, a passionate philosopher. From the first to last, she is the lyric poet, the singer of songs. There is no artifice in her poetry. She sings from the heart". Edmund Gusse points out in his introduction, she springs from the very soil of India, her spirit, although it employs the English Language as its vehicle, has no other tie with West. So many great scholars have praised her writing in and outside India. Sir C.P. Ramaswamy Iyer who had known her since her school days gave significant features of her writing. According to him, the first vol. 'The Golden Threshold ' was linked to her happy domestic phase, the second 'The Bird of Time' to her developing phase when the great noble ideals of humanity began to move her directly and she started work for the emancipation of Women. The last 'The Broken Wing' was the age of her emotion. It was during this phase that her passionate devotion to the cause of Hindu – Muslim unity centered itself first on Gokhale and late Mohammed Ali Jinnah.

Sarojini Naidu's poems reflect her art of writing poetry which is marked by her originality of thoughts and spontaneity of expression. She was gifted artist having ornamental and sophisticated style. Her poetry reflected that she was a superb artist in the use of words. It contained the language which burnt with feeling & passion and was as sweet as birds song. She writes instant poetry where images and metaphors come rolling ready on the hot plates of imagination. Her poems dealt with themes as nature, folk life, Indian flora & fauna, Indian customs & traditions, patriotism, love & death.

It is the harmony of words, the relation of thought and rhythm that makes poetry an effective part of literature. She was careful regarding the selection of words that lent grace to her poetry and helped her to convey her inner most feelings. She employed a polished diction. Her poetry reflects her command over English language. Her sonorous and

unusual words add to the subtlety of expression of ideas and display a keen perception of beauty (Dwivedi P.137)

Naidu's use of striking similes is one of the unique qualities of her poetry. Her similes succeed in capturing reader's attention and provide grandeur to her thoughts and expressions. Her similar bear the stamp of Indian ness. She also used vernacular words very effectively which provided a charisma and artfulness in the expression of her thoughts and captured beautifully her subtle native passion. Vernacular words not only lend rhyming grace but also lend the feature of Indianness to her poetry.

Broadly speaking, the poem of Sarojini Naidu could be classified into five categories though she never did so. At least one-third of Sarojini's poems deal with love and its various manifestations, next some of those dealing with nature and then those dealing with the problems of life and death. The fourth group consists of songs on folk themes and Indian scenes and finally there are patriotic poems including those addressed to national leaders.

In later half o the 19th century, there were two plants of exotic growth, bringing to it a new colour and a strange beauty to which it was hitherto unused. One was the lily of Toru Dutt, the other was the rose of Sarojini – tiny, bright, sweet and fragrant. In considering the poetry and personality of the two in Indian English writing, we might remember Toru Dutt was almost classical in her sense of form, her restraint and reserve. Sarojini was obviously and impenitently romantic in her outlook – her sense of colour, her wide eyed wonder at the world and her spontaneous ecstasy.

Like that the other famous Indian English poet is Rabindranath Tagore. There is a more radical difference between them, the work of Tagore appears in English is a translation all done by the poet himself Naidu's work in English poetry in form & diction, and as an art subject

to all the laws and ordinances of that particular common instrument for the expression of individual souls.

Some of her acclaimed poems are The Wizard Mask & A Treasury of poems. Other selected works written by her include The Magic Tree and The Gift of India Gopala Krishna Gokhale once advised her to use her poetry and her beautiful words to rejuvenate the spirit of independence in the hearts of villagers and also asked her to use her talent to free Mother India.

In 1935 Sri Aurobindo observed that Sarojini's poetry was among the lasting things in English literature and that she would take her place among the immortals. The prophecy has come true.

We have the poetess rejoicing in the Shelleyan Stretch of inaccessible desire and heavenward hunger and there we have the Indian poetess singing ostensibly of the Buddha yet throwing the whole philosophy of the Vedanta into the last two lines. Thus Sarojini Naidu glitters in all faces of literature than other poets in Indian English history.

CONCLUSION :

Today Sarojini Naidu is among the immortal not only because of her great services to the country as a soldier of freedom and a builder of modern India but also because of her enchanting poetry that has thrilled several generations. In fact her poetry or rather her genius for poetry was one of the forces that intensified the progress of national movement. Nevertheless, her name will always be remembered in the golden history of India as an inspiring poet.

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EFFECT OF YOGIC TRAINING AND BRISK WALKING ON SELECTED PHYSIOLOGICAL VARIABLE (MEAN ARTERIAL BLOOD PRESSURE) AMONG DIABETIC PATIENTS

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ABSTRACT

The purpose of this study was to determine the relative "Effect of yogic training and brisk walking on selected physiological variables (Mean Arterial Blood Pressure) among diabetic patients". the study was to estimate the relative, The subjects of the study were selected at random and divided into three groups. Among the three groups, the control group was strictly under control, without undergoing any special activity. The experimental groups were undergone with the experimental treatments. Pre- and post-experimental data on selected physiological variables from all the subjects to find out the effects of yogic training and brisk walking. Randomly selected (N=30) diabetic patients who were undergoing treatment in Government Hospital, Hyderabad were selected as subjects for this study with their consent. The subjects were divided into three groups, experimental group-I, experimental group-II and control group. Experimental group-I underwent yogic practices, experimental group-II underwent brisk walking and control group was not given any special treatment. Pre--tests were conducted for all the subjects on selected physiological variables such as, mean arterial blood pressure,. The experimental groups participated in their respective exercises, namely brisk walking for twelve weeks and yogic exercises for twelve weeks.The post--tests were conducted on the above said dependent variables after a period twelve weeks. The difference between the initial and final scores was considered the effect of respective experimental treatments. To test the

statistical significance ANCOVA was used. In all cases 0.05 level was fixed to test the hypothesis.

Key Words: yogic training, Brisk walking, physiological variable, Mean Arterial Blood Pressure

Introduction

YOGA:-Yoga means the experience of oneness or unity with inner being. This unity comes after dissolving the duality of mind and matter into supreme reality. It is a science by which the individual approaches truth. The aim of all yoga practice is to achieve truth where the individual soul identifies itself with the supreme soul or God. Yoga has the surest remedies for man's physical as well as psychological ailments. It makes the organs of the body active in their functioning and has good effect on internal functioning of the human body. Yoga is a re-education of one's mental process, along with the physical.The stages of yoga are eight, *Yama, Niyama, Pranayama, Pratyahara, Dharana, Dhyana* and *Samathi*, they are all integrated (Iyangar, B.K.S. 1999).

WALKING:- Walking, also called ambulation is the main form of animal locomotion on land, distinguished from running and crawling. When carried out in shallow waters, it is usually described as wading and when performed over a steeply rising object or an obstacle it becomes scrambling or climbing. The word walk is descended from the Old English wealcan "to roll".

BRISK WALKING:-Human walking is accomplished with a strategy called the double pendulum. During forward motion, the leg that leaves the ground swings forward from the hip. This sweep is the first pendulum. Then the leg strikes the ground with the heel and rolls through to the toe in a motion described as an inverted pendulum. The motion of the two legs is coordinated so that one foot or the other is always in contact with the ground. The process of walking recovers

approximately sixty per cent of the energy used due to pendulum dynamics and ground reaction force.

PHYSIOLOGY:-Physiology is the science of functioning of all the organs and systems of an organism. For the physiological system of the body to be fit, they must function well enough to support to specific activity that the individual is performing more over different activity make different demands upon the organism with respect to circulatory, respiratory, metabolic and neurologic process which are specific to the activity.

In physiology, one learn how the organs, systems, tissues, cells and molecules within cells work and how their functions are put together to maintain the internal environment. Physiology is the science dealing with the study of human body functions. Exercise physiology is the study of how body's structures and functions are changed as a result of exercise. It applies the concept of exercise physiology to training the athlete and enhancing the athlete's sports performance (Ajmer Singh, 2005).

Mean Arterial Pressure:-Mean arterial blood pressure is defined as the average arterial pressure during a single cardiac cycle. As blood is pumped out of the left ventricle into the arteries, pressure is generated. The mean arterial pressure (MAP) is determined by the cardiac output, systematic vascular resistance and central venous pressure according to the following relationship, which is based upon the relationship between flow, pressure and resistance (Mathews, 1981).

STATEMENT OF THE PROBLEM:-The purpose of this study was to determine the relative "Effect of yogic training and brisk walking on selected physiological variables(Mean Arterial Blood Pressure)among diabetic patients".

METHODOLOGY:-The purpose of the study was to find out the relative effect of yogic training and brisk walking on selected physiological variables (Mean Arterial Blood Pressure)among diabetic patients. the selection of subjects, selection of variables, pilot study, reliability of the data, Training schedule, administration of tests, research design for the study, laboratory tests taken for the subjects, experimental procedure and the statistical technique used.

SELECTION OF SUBJECTS:-Thirty male subjects who were undergoing treatment in Government Hospital, Hyderabad for diabetic were randomly selected in the age group of thirty five to forty five years were selected and they were assigned into three different groups. The groups were considered as experimental group-I, experimental group-II and control group consisting of ten diabetic patients in each.

Control Group:-Subjects who were in the control group didn't undergo any exercise but followed their routine diabetic treatment and diet pre-scribed by the physicians.

Experimental Group-I:-Along with their routine diabetic medication subjects were provided with the brisk continuous walking for 30 minutes without rest. The walking exercise were performed from Monday through Saturday for six days in a week.

Experimental Group-II:-Along with their routine diabetic medication subjects were provided with yogic training for 30 minutes. The training were provided from Monday through Saturday for six days in a week.The requirements of the experimental procedures, testing as well as exercise schedules were explained to them so as to avoid any ambiguity of the effort required on their part and prior to the administration of the study, the investigator got the individual consent from each subject.

SELECTION OF VARIABLES:-The research scholar reviewed the various scientific literatures pertaining to diabetics, exercises for

diabetic patients and on the effects of walking and yogic practices on physiological variables from books, journals, periodicals, magazines and research papers. Taking into consideration of feasibility criteria, availability of instruments and the relevance of the variables of the present study, the following variables were selected.

Dependent Variables:- Physiological Variables

Mean Arterial Blood Pressure

Independent Variables

1. Twelve weeks of Brisk Walking Exercises
2. Twelve Weeks Yogic Training

EXPERIMENTAL DESIGN

Random group design was followed in this study. Randomly selected (N=30) diabetic patients who were undergoing treatment in Government Hospital, Hyderabad were selected as subjects for this study with their consent. The subjects were divided into three groups, experimental group-I, experimental group-II and control group. Experimental group-I underwent yogic practices, experimental group-II underwent brisk walking and control group was not given any special treatment. Pre--tests were conducted for all the subjects on selected physiological variables such as, mean arterial blood pressure,. The experimental groups participated in their respective exercises, namely brisk walking for twelve weeks and yogic exercises for twelve weeks.

The post--tests were conducted on the above said dependent variables after a period twelve weeks. The difference between the initial and final scores was considered the effect of respective experimental treatments. To test the statistical significance ANCOVA was used. In all cases 0.05 level was fixed to test the hypothesis.

COLLECTION OF DATA:-The purpose of the study was to estimate the relative effects of yogic training and brisk walking on selected physiological variables among diabetic patients. For this purpose, the research scholar followed the following procedure

The subjects of the study were selected at random and divided into three groups. Among the three groups, the control group was strictly under control, without undergoing any special activity. The experimental groups were undergone with the experimental treatments.

The experimental groups were well acquainted with their allotted techniques and did only the experimental treatment given to them for a period of twelve weeks under the personal supervision of the researcher.

Pre- and post-experimental data on selected physiological variables from all the subjects to find out the effects of yogic training and brisk walking.

TRAINING PROGRAMME

Yogic Training

In order to give scientific yogic training to the subjects, the investigator selected *asanas* for warm up, *asanas* for practice, *pranayama* for breath holding and cleansing and *savasana* for relaxation.

Each session lasted for 45 minutes consisting of 10 minutes warm up, followed by five *asanas* each lasting for 15 minutes (5 x 3 minutes), 10 minutes *pranayama* and 10 minutes relaxation.

Suryanamaskar was given to the subjects as warm up *asana*, any five of the following *asanas Padmasana, Adhra Chakrasana, Vipareet Karanai Muudra, Ardha Paasantmuktasana, Vajrasana, Trikonasana, Padahastasana, Halasana, Bhujangasana, Salabasana,*

Dhanurasana, Paschimotanasana were given to the subjects as *yagasana* practices. Any two of the three *pranayamas Nadi Sodhana Pranayama, Kapalabhati Pranayama* and *Sheetali Pranayama* were given to the subjects. As a relaxation *asana*, *savasana* was asked to be practiced for 10 minutes.

Table 1

YOGIC PRACTICES FOR FIRST FOUR WEEKS

S.No.	Yogic Practices	Duration
1	*Surya Namaskar*	10 minutes
2	*Padmasana*	3 minutes
3	*Ardha Chakrasana*	3 minutes
4	*Vipareet Karani Mudra*	3 minutes
5	*Ardha Paasantmuktasana*	3 minutes
6	*Padahastasana*	3 minutes
7	*Kapalbhati Pranayama*	5 minutes
8	*Sheetali Pranayama*	5 minutes
9	*Savasana*	10 minutes

Table II

YOGIC PRACTICES FOR FIFTH TO EIGHTH WEEKS

S.No.	Yogic Practices	Duration
1	*Surya Namaskar*	10 minutes
2	*Vajrasana*	3 minutes
3	*Trikonasana*	3 minutes

4	*Padahastasana*	3 minutes
5	*Halasana*	3 minutes
6	*Bhujangasana*	3 minutes
7	*Nadi Sodhana Pranayama*	5 minutes
8	*Sheetali Pranayama*	5 minutes
9	*Savasana*	10 minutes

Table III

YOGIC PRACTICES FOR NINTH TO TWELVTH WEEKS

S.No.	Yogic Practices	Duration
1	*Surya Namaskar*	10 minutes
2	*Halasana*	3 minutes
3	*Bhujangasana*	3 minutes
4	*Salabasana*	3 minutes
5	*Dhanurasana*	3 minutes
6	*Paschimotanasana*	3 minutes
7	*Nadi Sodhana Pranayama*	5 minutes
8	*Kapalvali Pranayama*	5 minutes
9	*Savasana*	1- 3 minutes

Training Procedure

The training programmes, namely, yogic practices were given to subjects in circuit training basis for five days a week for a period of

twelve weeks in the morning sessions were admitted. Proper warming up and very basic things required for the training were provided to the subjects. The investigator sought the help of two assistants who were well versed with these training programmes for the smooth functioning of the treatment and for controlling the subjects during the course of training.

Brisk Walking Training

Experimental group subjects for brisk walking were required to undergo brisk walk for 30 minutes continuously without any rest. They underwent this training from Monday to Saturday, six weeks per weeks, excluding Sundays, the experimental period was for 12 weeks. Proper warm up and warm down timings were given to the subjects during the experimental period

Mean Arterial Blood Pressure

Blood pressure:-The purpose of the test was to measure the systolic and diastolic blood pressure.

Equipment:-A dial types of sphygmomanometer and stethoscope a chart and a table was used for recording the blood pressure.

Procedure:-The blood pressure for all the subjects was checked in the morning. The subjects were given adequate time to relax in a chair in a comfortable position so that the normal pressure was restored. While taxing the blood pressure the subjects' right arm was completely made bare to make certain that the clothes did not compress the blood vessels. The instrument was kept at the level of the heart on the table. The blood pressure measurement was taken with the subject in sitting positions the forearm being kept straight in relaxed positions on the table. The pressure cuff was wrapped around the arm evenly the lower edge being placed approximately one inch above the anticubical space. Care was taken that the stethoscope was not in contact with the cuff.

The cuff was inflated until the artery was fully pressed, so that no heart beat could be learned.

When the heart beat was not audible air was released by opening the air value of the rubber tube and the systolic stroke the heart sent to spurt into artery and at the peak of the systolic stroke. The first heart beat become audiable at which instant the read in millimeter of measuring (mmhg) was recorded with the gradual release of air, the heart beat become muffled and then disappeared. This indicated blood pressure at the diastolic stage and the reading was noted in mm Hg.

Like the same blood pressure was recorded after the walking exercise was over.

Mean arterial pressure:-Mean arterial pressure also measured by using the formula.

P mean = Diastolic pressure + 1/3 pulse pressure.

Pulse pressure is the difference between systolic pressure and diastolic pressure.

RESULTS ON MEAN ARTERIAL BLOOD PRESSURE

The statistical analysis comparing the initial and final means of Mean Arterial Blood Pressure due to Yogic practices and Brisk walking among diabetic patients is presented in Table IV

COMPUTATION OF ANALYSIS OF COVARIANCE OF MEAN ARTERIAL BLOOD PRESSURE

	Yogic Practices Group	Brisk Walking Group	Control Group	Source Of Variance	Sum Of Squares	Df	Mean Squares	Obtained F
Pre-Test Mean	93.30	91.50	92.30	Between	16.27	2	8.13	0.23
				Within	940.70	27	34.84	
Post-Test Mean	84.90	87.10	91.60	Between	233.27	2	116.63	6.99*
				Within	450.20	27	16.67	
Adjusted Post-Test Mean	84.55	87.43	91.63	Between	252.49	2	126.24	10.40*
				Within	315.47	26	12.13	
Mean Difference	-8.40	-4.40	-0.70					

Table F-ratio at 0.05 level of confidence for 2 and 27 (df) =3.35, 2 and 26 (df) =3.37.

*Significant at 0.05 level

As shown in Table IV , the obtained pre-test means on Mean Arterial Blood Pressure on Yogic practices group was 93.30, Brisk walking group was 91.50 was and control group was 92.30. The obtained pre- test F-value was 0.23 and the required table F-value was 3.35, which proved that there was no significant difference among initial scores of the subjects.

The obtained post-test means on Mean Arterial Blood Pressure on Yogic practices group was 84.90, Brisk walking group was 87.10 was and control group was 91.60. The obtained post-test F-value was 6.99 and the required table F-value was 3.35, which proved that there was significant difference among post- test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done. The obtained F-value 10.40 was greater than the required value of 3.37 and hence it was accepted that there were significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post- hoc analysis using Scheffe's Confidence Interval test. The results were presented in Table V.

Scheffe's Confidence Interval Test Scores on Mean Arterial Blood Pressure

MEANS				Required C.I.
Yogic practices Group	Brisk walking Group	Control Group	Mean Difference	
84.55	87.43		2.88	4.03
84.55		91.63	7.08	4.03
	87.43	91.63	4.20	4.03

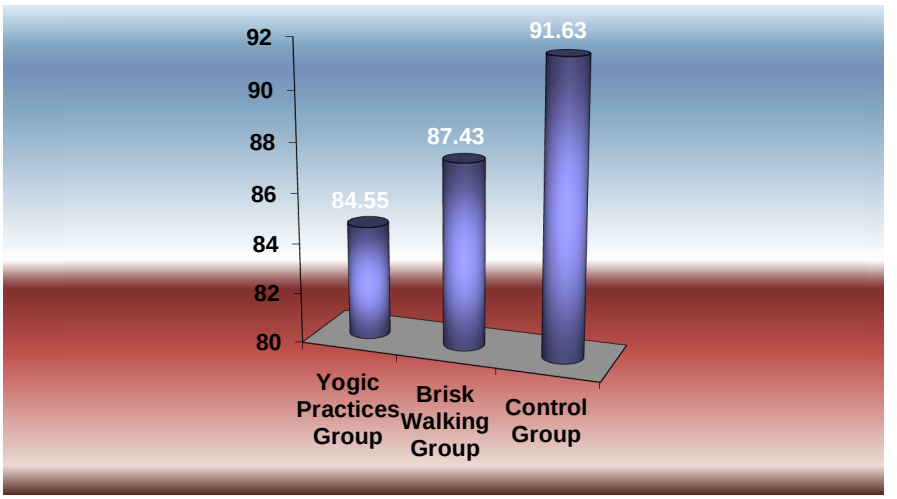
***** Significant at 0.05 level

The post- hoc analysis of obtained ordered adjusted means proved that there were significant differences existed between Yogic practices group and control group (MD: 7.08). There was significant difference between Brisk walking group and control group (MD: 4.20). There was no significant difference between treatment groups, namely, Yogic practices group and Brisk walking group. (MD: 2.88).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure-I.

Figure-I

BAR DIAGRAM ON ORDERED ADJUSTED MEANS ON MEAN ARTERIAL BLOOD PRESSURE



DISCUSSIONS ON FINDINGS ON MEAN ARTERIAL BLOOD PRESSURE

The effect of Yogic practices and Brisk walking on Mean Arterial Blood Pressure is presented in Table IV. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 10.40 was greater than the required table F-value to be significant at 0.05 level.

Since significant F-value was obtained, the results were further subjected to post-hoc analysis and the results presented in Table V proved that there was significant difference between Yogic practices group and control group (MD: 7.08) and Brisk walking group and control group (MD: 4.20). Comparing between the treatment groups, it was found that there was no significant difference between Yogic practices and Brisk walking group among diabetic patients.

Thus, it was found that yogic practices and Brisk walking were significantly better than control group in beneficially altering Mean Arterial Blood Pressure of the diabetic patients.

The post-hoc analysis of obtained ordered adjusted means proved that there were significant differences existed between control group and experimental treatments, namely, yogic exercises and brisk walking. This proved that due to twelve weeks brisk walking exercises and yogic exercises the diabetic patients have stabilized their mean arterial blood pressure. When comparing between the experimental groups, it was found that there were no significant differences between yogic exercises group and brisk walking group.

The twelve weeks *yogasana* training and brisk walking induced to exert more energy and exercise themselves along with their usual medication. As the subjects began to do the physical exertion there was increased blood circulation, which resulted in stabilization of blood pressure. With the additional aerobic power, the blood pressure began

to stabilize. Hence, there was reduction in blood pressure. The findings proved that the twelve weeks of yogic and walking exercises has beneficially altered mean arterial blood pressure significantly.

Yeater (1999) found two months supervised exercise sessions consisted of 40-45 minutes of walking and/or slow jogging resulted in resting systolic blood pressure decreased from 141 to 130 mmHg. After training and resting heart rate decreased in the exercise group in seven or eight subjects and in only two of eight controls. Wallberg-Henrikson (1998) found exercise training also improved many other physiological and metabolic abnormalities that are associated with diabetics including reducing blood pressure. Lohan and Rajesh (2002) found blood pressure, heart rate, breath holding time, vital capacity and pulse rate was improved by the training of selected yogic exercise. The findings of this study are in agreement to the above findings.

DISCUSSIONS ON HYPOTHESIS

There would be significant difference in selected physiological variables, mean arterial blood pressure due to yogic practices and brisk walking comparing to control group among diabetic patients.

There would be no significant differences between yogic practices and brisk walking in altering selected physiological variables among diabetic variables.

The results presented in Tables 4.5 on physiological variables mean arterial blood pressure respectively proved that the obtained F-values were greater than the required table F-value to be significant at 0.05 level. The post-hoc analysis results presented in Tables 4.6 on the physiological variables proved that twelve weeks yogic practices and brisk walking significantly improved selected physiological variables, mean arterial blood pressure. The formulated hypothesis No. 1 stated that there would be significant difference in selected physiological variables mean arterial blood pressure due to yogic practices and brisk

walking comparing to control group among diabetic patients was accepted at 0.05 level.

CONCLUSIONS

It was found that twelve weeks yogic practices and brisk walking significantly altered physiological variable, mean arterial blood pressure among diabetic patients and the comparisons between treatment groups proved that there was no significant difference between the experimental groups.

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NORMED MEASURE ON A*-ALGEBRAS

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Abstract:

In this paper we introduce normed measure on A*- algebra, a theorem stating every probability measure on Boolean algebra generates a normed measure on the A*-algebra generated by the Boolean algebra, a theorem stating every probability measure on a σ-algebra of subsets of a set X extends to a normed measure on an A*-algebra of sets of X, we introduce independently Trinomial theorem, theoretical distribution called Trinomial distribution, Expectation and variance of a Trinomial Distribution.

1. Preliminaries

1.1 Definition: Let X be any set. A non-empty collection $\mathcal{A}$ of subsets of X is called an Algebra of sets or a Boolean Algebra of sets if it satisfies the following two conditions:

i. $A, B \in \mathcal{A} \Rightarrow A \cup B \in \mathcal{A}$

ii. $A \in \mathcal{A} \Rightarrow (X - A) \in \mathcal{A}$

1.2 Theorem: Let $\mathcal{C}$ be any collection of subsets of X. Then there is a smallest algebra $\mathcal{A}$ which contains $\mathcal{C}$.

1.3 Definition: Let $\mathcal{C}$ be a collection of subsets of X. Then the smallest algebra of sets of X containing $\mathcal{C}$ is called algebra generated by $\mathcal{C}$.

1.4 Result: Let $\mathcal{A}$ be an algebra of subsets of X and $\{A_n\}$ be a sequence of sets in $\mathcal{A}$.

Then there is a sequence $\{B_n\}$ of sets in $\mathcal{A}$ such that $\bigcup_n A_n = \bigcup_n B_n$ and $B_n \cap B_m = \emptyset$ for $m \neq n$.

1.5 Definition: Let X be a set. A non-empty collection of subsets of X is called a σ –algebra or a borel field, if it is closed under complementations and countable unions.

1.6 Note: Any σ – algebra is an algebra. If $\mathcal{A}$ is a σ – algebra of sets of , then $\mathcal{A}$ is closed under countable intersections. An algebra of sets of X need not be σ – algebra.

1.7 Result: Let $\mathcal{C}$ be any collection of subsets of X.Then there is a smallest σ –algebra which contains $\mathcal{C}$.

1. 8 Definition: By a measure μ on a measurable space $(X, \mathcal{B})$ we mean a non negative set

function defined for all sets of $\mathcal{B}$ and satisfying

$\mu(\emptyset) = 0$ and $\mu\left(\bigcup_{i=1}^{\infty} E_i\right) = \sum_{i=1}^{\infty} \mu(E_i)$ for any sequence E_i of

disjoint measurable sets. By a measure space $(X, \mathcal{B}, \mu)$ we mean a measurable space $(X, \mathcal{B})$ together with a measure μ defined on $\mathcal{B}$.

1. 9 Definition: (**i**)The property $\mu(\cup_{i=1}^{\infty} E_i) = \sum_{i=1}^{\infty} \mu(E_i)$, $E_i \cap E_j =$ $\emptyset$ for $i \neq$ j, of μ is called countable additive property of μ.

(**ii**)This μ has $(\cup_{i=1}^{n} E_i) = \sum_{i=1}^{n} \mu(E_i)$, $E_i \cap E_j = \emptyset$ for $i \neq$ j, which is called finitely additive property of μ , by putting $E_i = \emptyset$ for all $i > n$.

1.10 Definition: Suppose A is a set of real numbers. We define the Lebesgue outer measure $m^*(A)$ of A by

$$m^*(A) = \inf \sum_n l(I_n), \{I_n\} \text{ is a sequence of open intervals } \ni A \subseteq \bigcup_n I_n$$

1.11 Note:(i) The Lebesgue outer measure of an interval is its length.

(ii) Let $\{A_n\}$ be a countable collection of sets of real numbers.

Then $m^*\left(\bigcup_n A_n\right) = \sum_n m^*(A_n)$.

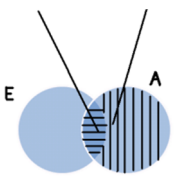
(iii) If A is countable, then $m^*(A) = 0$.

(iv) Given any set A and > 0, there is an open set $O \ni A \subseteq O$ and $m^*(O) \leq m^*(A) + \epsilon$ and there is a $G \in G_\delta$ such that $A \subseteq G$ and $m^*(A) = m^*(G)$.

(v) m^* is translation invariant.

1.12 Definition: A set E is said to be a Lebesgue measurable if for each set A, we have $m^*(A) = m^*(A \cap E) + m^*(A \cap \tilde{E})$.

$A \cap E$ $A \cap \tilde{E}$



$------ m^*(A) = m^*(A \cap E) + m^*(A \cap \tilde{E})$

1.13 Note: (i) If $m^*(E) = 0$, then E is measurable.

(ii) The collection $\mathcal{M}$ of Lebesgue measurable sets is a σ-algebra of sets.

1.14 Definition: Define measure m on $\mathcal{M}$ as follows:

$m(A) = m^*(A)$ for all $A \in \mathcal{M}$.

1.15 Theorem: If $\in \mathcal{B}$, and $A \subseteq B$, then $\mu(A) \leq \mu(B)$

1.16 Theorem: If $E_i \in \mathcal{B}$, $\mu(E_1) < \infty$ and $E_i > E_{i+1}$, then

1.17 Theorem: If $E_i \in \mathcal{B}$, then $\mu\left(\bigcup_{i=1}^{\infty} E_i\right) \leq \sum_{i=1}^{\infty} E_i$.

1.18 Definition: A measurable set is called finite if $\mu(X)$ is finite.

A measure μ is called σ-finite if there is a sequence$\{X_n\}$ of measurable sets

such that $X = \cup_{n=1}^{\infty} X_n$ and $\mu(X_n) < \infty \forall n$ .A set E is said to be of finite measure if $E \in \mathcal{B}$ and $\mu(E) < \infty$.

A set E is said to be of σ-finite measure if E is the union of countable collection of measurable sets of finite measure.

1.19 Definition: A measure μ is said to be semi finite if each measurable set of infinite measure contains measurable sets of arbitrary large finite measure.

1.20 Definition: A measure space$(X, \mathcal{B}, \mu)$ is said to be complete if $\mathcal{B}$ contains all subsets of sets of measure zero.

1.21 Theorem: If $(X, \mathcal{B}, \mu)$ is a measure space then we can find a complete measure pace $(X, \mathcal{B}_0, \mu_0)$ such that

(i) $\mathcal{B} \subseteq \mathcal{B}_0$

(ii) $E \in \mathcal{B} \Rightarrow \mu(E) = \mu_0(E)$

(iii) $E \in \mathcal{B}_0 \Leftrightarrow E = A \cup B$ where $B \in \mathcal{B}$ and $A \subset C$, $C \in \mathcal{B}$,

$\mu C = 0$

1.22 Note: The measure space$(X, \mathcal{B}_0, \mu_0)$ is called the completion of $(X, \mathcal{B}, \mu)$.

1.23 Definition: Let (X, $\mathcal{B}$, μ) be a measure space. A subset E of X is said to be locally measurable if $E \cap B \in \mathcal{B}$ for every $B \in \mathcal{B}$ with

$\mu B < \infty$.

1.24 Note: The collection $\mathcal{C}$ of all locally measurable sets is a σ-algebra containing $\mathcal{B}$.

1.25 Definition: A measure μ is called saturated, if every locally measurable set is measurable

1.26 Note: Every σ-finite measure is saturated

1.27 Theorem: Suppose f is an extended real valued function defined on X where $(X, \mathcal{B})$ is a measurable space. Then the following conditions are equivalent:

(i) $\{x/f(x) < \alpha\} \in \mathcal{B}$ for each α

(ii) $\{x/f(x) \leq \alpha\} \in \mathcal{B}$ for each α

(iii) $\{x/f(x) > \alpha\} \in \mathcal{B}$ for each α

(iv) $\{x/f(x) \geq \alpha\} \in \mathcal{B}$ for each α

1.28 Definition: The extended real valued function f defined on X is called measurable (or measurable with respect to $\mathcal{B}$) if any one of the statements of the above theorem holds

1.29 Theorem: If c is a constant and the functions f and g are measurable, then so are the functions $f + c, cf, f + g, f \cdot g$ and $f \vee g$. Moreover, if $\{f_n\}$ is a sequence of measurable functions then sup f_n ,inf f_n , $\overline{limit}\, f_n$, and $\underline{limit}\, f_n$ are all measurable

1.30 Definition: By a simple function we mean a finite linear combination

$\phi(x) = \sum_{i=1}^{n} c_i \chi_{E_i}(x)$ of characteristic functions of measurable sets E_i.

1.31 Theorem: Let f be a non negative measurable function. Then there is a sequence $\{\phi_n\}$ of simple functions with $\phi_{n+1} \geq \phi_n$ such that $f = \lim_{n} \phi_n$ at each point of X. If f is defined on a σ – finite measure space, then we may choose the functions ϕ_n so that each vanishes outside a set of finite measure.

1.32 Note: A property is said to hold almost everywhere (abbreviated a. e) if the set of points where it fails to hold is a set of measure zero. Thus in particular we say that $f = g\ a.e$ if f and g have same domain and $\mu(\{x/f(x) \neq g(x)\}) = 0$.

1.33 Theorem: If μ is a complete measure and f is a measurable function, then $f = g\ a.e$ implies g is measurable.

1.34 Theorem: Suppose that to each α in a dense set D of real numbers there is assigned a set $B_\alpha = \mathcal{B}$ such that $B_\alpha \subset B_\beta$ for $\alpha < \beta$ .Then there is a unique measurable extended real valued function f on X such that $f \leq \alpha\ on\ B_\alpha$ and $f \geq \alpha$ on $X - B_\alpha$

1.35 Theorem: Suppose that for each α in a dense set D of real numbers there is assigned a set $B_\alpha \in \mathcal{B}$ such that $\mu(B_\alpha - B_\beta) = 0$ for $\alpha < \beta$. Then there is a measurable function f such that $f \leq \alpha\ a.e$ on B_α and $f \geq \alpha\ a.e$ on $-B_\alpha$. If g is any other function with this property then $g = f\ a.e$.

1.36 Definition: Let E be a measurable set and ϕ a non negative simple function and suppose that

$\phi = \sum_{i=1}^{n} c_i \chi_{E_i}$ .Then we define $\int_E \phi\, d\mu = \sum_{i=1}^{n} c_i \mu(E \cap E_i)$.

1.37 Note: (i). The value of this integral is independent of the representation of ϕ.

(ii). If a and b are two positive real numbers and ϕ and ψ are non negative simple functions then $\int(a\phi + b\psi) = a\int\phi + b\int\psi$.

(iii). Let f be a bounded measurable function which vanishes outside a measurable set of finite measure. Then $\inf_{\psi\geq f}\int\psi = \sup_{\phi\leq f}\int\phi \Leftrightarrow f = g\ a.e$ for some measurable function g and equality holds if f is measurable with respect to the completion $\bar{\mu}$ on μ.

(iv). Throughout our discussion ' 'stands for complete measure.

1.38 Definition: Let f be a non negative extended real valued measurable function defined on the measure space $(X, \mathcal{B}, \mu)$.

Then $\int_E f\,d\mu$ is the supremum of the integrals $\int\phi\,d\mu$

where ϕ ranges over all simple functions with $0 \leq \phi \leq f$ i.e., $\int_E f\,d\mu = \sup_{\substack{0\leq\phi\leq f \\ \phi\ is\ simple}}\int\phi\,d\mu$.

1.39 Note: (i). If f and g are two non negative extended real valued measurable functions $\ni f \leq g$, then $\int_E f \leq \int_E g$.

(ii). If f is any extended real valued measurable function and c is any non negative real number then $\int cf = c\int f$

1.40 Fatou's Lemma: Let $\{f_n\}$ be a sequence of non negative measurable functions that converge $a.e$ on a set E to a function f then $\int_E f \leq \underline{limit}\int_E f_n$

1.41 Theorem: (Monotone Convergence Theorem)

Let $\{f_n\}$ be a sequence of non negative measurable functions which converge $a.e$ to a function f and suppose that $f_n \leq f$. Then $\int f = \underset{n}{limit} \int f_n$

1.42 Theorem: If f and g are non negative measurable functions and a & b are non negative constants then $\int(af + bg) = a\int f + b\int g$ and also we have $\int f \geq 0$ with equality only if $f = 0$ $a.e$.

1.43 Corollary: Let $\{f_n\}$ be a sequence of non negative measurable functions.

Then $\int \sum_{n=1}^{\infty} f_n = \sum_{n=1}^{\infty} \int f_n$.

1.44 Definition: A non negative function f is called integrable(over a measurable set E with respect to μ) if it is measurable and $\int_E f\, d\mu < \infty$.

1.45 Definition: An arbitrary function f is said to be integrable, if $f^+$and f^- are integrable and we define $\int_E f = \int_E f^+ - \int_E f^-$.

1.46 Theorem: If f & g are integrable functions and E is a measurable set, then

(1) $\int_E (c_1 f + c_2 g) = c_1 \int_E f + c_2 \int_E g$

(2) If $f \geq g$ $a.e$ then $\int f \geq \int g$

1.47 Theorem (Lebesgue Convergence Theorem):

Let g be integrable over E and suppose that $\{f_n\}$ is a sequence of measurable functions ∋ on E $|f_n(x)| \leq g(x)$ and also

$f_n(x) \to f(x) a.e$ on E. Then $\int_E f = \lim_n \int_E f_n$.

1.48 Definition: An algebra $(A, \wedge, *, (-)^{\sim}, (-)_{\pi}, 1)$ is an A^* - algebra if it satisfies **:**

For a, b, c$\in$A

(i) $a_\pi \vee (a_\pi)^{\sim} = 1$, $(a_\pi)_\pi = a_\pi$, where $a \vee b = (a^{\sim} \wedge b^{\sim})^{\sim}$

(ii) $a_\pi \vee b_\pi = b_\pi \vee a_\pi$

(iii) $(a_\pi \vee b_\pi) \vee c_\pi = a_\pi \vee (b_\pi \vee c_\pi)$

(iv) $(a_\pi \wedge b_\pi) \vee (a_\pi \wedge (b_\pi)^{\sim}) = a_\pi$

(v) $(a \wedge b)_\pi = a_\pi \wedge b_\pi$, $(a \wedge b)^{\#} = a^{\#} \vee b^{\#}$,where $a^{\#} = (a_\pi \vee a^{\sim}_\pi)^{\sim}$

(vi) $a^{\sim}_\pi = (a_\pi \vee a^{\#})^{\sim}$, $a^{\sim\#} = a^{\#}$

(vii) $(a*b)_\pi = a_\pi$, $(a*b)^{\#} = (a_\pi)^{\sim} \wedge (b^{\sim}_\pi)^{\sim}$

(viii) $a = b$ if and only if $a_\pi = b_\pi$, $a^{\#} = b^{\#}$.

We write 0 for $1^{\sim}$,2 for 0_*1.

1.49 Example: 3 ={0,1,2} with the operations defined below is an A* -algebra.

$\wedge$	0	1	2
0	0	0	2
1	0	1	2
2	2	2	2
*	0	1	2
0	0	2	2
1	1	1	1
2	0	2	2

$\vee$	0	1	2
0	0	1	2
1	1	1	2
2	2	2	2
x	0	1	2
$x^{\sim}$	1	0	2
x_π	0	1	0
$x^{\#}$	0	0	1

1.50 Note: From 4.1definition (i) and (iv) and Huntington's theorem,

$\mathcal{B}(A) = \{a_\pi / a \in A\}$ is a Boolean algebra with $\wedge, \vee, (-)^{\sim}, 0$ and $a \in \mathcal{B}(A) \Rightarrow a_\pi = a$. Since $1, 0, (a_\pi)^{\sim} \in \mathcal{B}(A)$, we have $1_\pi = 1, 0_\pi = 0$, $(a_\pi)^{\sim}{}_\pi = (a_\pi)^{\sim}$ and $a_\pi \wedge a^{\#} = 0$, $a * 0 = a_\pi$.

1.51 Lemma: For any x, y, z in an A*- algebra

(i) $x^{\sim\sim} = x$

(ii) $(x \wedge y)^{\sim}{}_\pi = (x^{\sim} \wedge y)_\pi \vee (x \wedge y^{\sim})_\pi \vee (x^{\sim} \wedge y^{\sim})_\pi$

(iii) $(x \vee y)_\pi = (x^{\sim} \wedge y)_\pi \vee (x \wedge y^{\sim})_\pi \vee (x \wedge y)_\pi$

(iv) $x \wedge (y \vee z) = (x \wedge y) \vee (x \wedge z)$

1.52 Lemma: For any x, y in A

(i) $(x * y)^{\sim}{}_\pi = (x_\pi)^{\sim} \wedge (y^{\sim})_\pi$

(ii) $x = x_\pi * (x^{\sim})_\pi{}^{\sim} = x_\pi * x^{\#}$

(iii) If $x = e * f$ where $e, f \in \mathcal{B}(A)$, $e \wedge f = 0$, then $x_\pi = e$, $x^{\#} = f$.

1.53 Theorem: Every A* algebra $(A, \wedge, *, (-)^{\sim}, (-)_\pi, 1)$ satisfies the following conditions **:**

For x, y, z $\in$ A,

(i) $x \wedge (y \wedge z) = (x \wedge y) \wedge z$

(ii) $x \wedge y = y \wedge x$

(iii) $x \wedge x = x$

(iv) $1 \wedge x = x$

(v) $(x^{\sim})^{\sim} = x$

(vi) $x \wedge (y \vee z) = (x \wedge y) \vee (x \wedge z)$

(vii) $1_\pi = 1$

(viii) $(x_\pi{}^\sim)_\pi = x_\pi{}^\sim$

(ix) $(x \wedge y)_\pi = x_\pi \wedge y_\pi$

(x) $(x \wedge x^\sim)_\pi = 0$

(xi) $x_\pi \wedge (x_\pi \vee y_\pi) = x_\pi$

(xii) $(x \wedge y)^\sim{}_\pi = (x \wedge y^\sim)_\pi \vee (x^\sim \wedge y)_\pi \vee (x^\sim \wedge y^\sim)_\pi$

(xiii) $(x_\pi)_\pi = x_\pi$

(xiv) $(x * y)_\pi = x_\pi$

(xv) $(x * y)^\sim{}_\pi = (x_\pi)^\sim \wedge (y^\sim)_\pi$

(xvi) $x = x_\pi * (x^\sim{}_\pi)^\sim$

1.54 Note: E.G.Manes around 1989, in a rough draft of his paper entitled "The Equational Theory of Disjoint Alternatives", the algebra $(A, \wedge, *, (-)^\sim, (-)_\pi, 1)$ satisfying **4.7(i) through(xvi)** called as an ada, which however differs from the definition of an ada.

1.55 Theorem: An algebra $(A, \wedge, *, (-)^\sim, (-)_\pi, 1)$ satisfying axioms of the above theorem is an A* algebra.

1.56 Proposition: In an A* algebra A, if $0 \neq 1$, then A has at least 3-elements.

1.57 Proposition: If $(A, \wedge, *, (-)^\sim, (-)_\pi, 1)$ is an A* algebra and a, b ∈ A, then

(i) $a_\pi = a \; if \; and \; only \; if \; a^\# = 0$

(ii) $a_\pi{}^\# = a^\#$

(iii) $a^{\#\sim}{}_\pi = a^{\#\sim}$

(iv) $a^{\#\#} = 0$

(v) $a_\pi \wedge a^{\#\sim} = a_\pi$

(vi) $a^{\#\sim} \wedge a^{\sim}{}_\pi = a^{\sim}{}_\pi$

(vii) $(a^{\#}) \wedge a^{\sim}{}_\pi = a^{\#} \wedge a_\pi = 0$

(viii) $(a_\pi)^{\sim} \wedge a^{\#} = a^{\#}$

(ix) $a^{\sim}{}_\pi \wedge (a_\pi)^{\sim} = a^{\sim}{}_\pi$

1.58 Example: Let X be a non empty set.

$T_X = \{(P,F)/P \subseteq X, F \subseteq X, P \cap F = \emptyset\}$. For $A, B \subseteq X$ denote intersection, union and complementation in the Boolean algebra $P(X)$ by $AB, A + B, A'$.

Define $\wedge, \vee, (-)^{\sim}, (-)_\pi, 1$ on T_X by

(i) $(P,F) \wedge (P_1,F_1) = (PP_1, PF_1 + FF_1, FP_1)$

(ii) $(P,F) \vee (P_1,F_1) = (PF_1, PP_1 + FP_1, FF_1)$

(iii) $(P,F)^{\sim} = (F,P)$

(iv) $1 = (X,\emptyset)$

(v) $(P,F)_\pi = (P,P')$

(vi) $(P,F) * (P_1,F_1) = (P,P'F_1)$

Then $(T_X, \wedge, (-)^{\sim}, (-)_\pi, *, 1)$ is an A^* −algebra

1.59 Definition: Let $(A,\wedge,*,(-)^{\sim},(-)_\pi,1)$ be an A^* −algebra and $A_1 \subseteq A$, A_1 is called a sub A^* −algebra of A if A_1 is closed under $\wedge, *, (-)^{\sim}, (-)_\pi, 0, 1$.

1.60 Definition: An A^* −algebra of sets (with universal set X) is a subset of T_X, closed under $\wedge, \vee, *, (-)^{\sim}, (-)_\pi$.

1.61 Definition: Let $(A_1,\wedge,\vee,(-)^{\sim},(-)_\pi,*,1)$ and $(A_2,\wedge,\vee,(-)^{\sim},(-)_\pi,*,1)$ be A^* −algebras. A mapping $f: A_1 \to A_2$ is called an A^* −homomorphism if

(i) $f(a \wedge b) = f(a) \wedge f(b)$

(ii) $f(a * b) = f(a) * f(b)$

(iii) $f(a_\pi) = \big(f(a)\big)_\pi$

(iv) $f(a^{\sim}) = \big(f(a)\big)^{\sim}$

(v) $f(1) = 1$

(vi) $f(0) = 0$

If in addition f is bijective, then f is called an A^*-isomorphism and A_1, A_2 are said to be isomorphic, denote in symbols $A_1 \cong A_2$.

1.62 Example: If X is any non empty set, $PF_n(X, 2) = \cup_{A \subseteq X} 2^A$ is an A^* −algebra with

respect to $\wedge, *, (-)^{\sim}, (-)_\pi, 1$ defined by

(i) $(a \wedge b)(x) = a(x) \wedge b(x)$ for all $x \in dom(a)$ and $dom(b)$

(ii) $a^{\sim}(x) = (a(x))^{\sim}$ for all $x \in dom(a)$

(iii) $1(x) = 1$ for all $x \in X$

(iv) $a_\pi(x) = 1 \; if \; a(x) = 1$

$= 0 \; if \; a(x) = 0$ or undefined

(v) $(a * b)(x) = 1 \; if \; a(x) = 1$

$= 0 \; if \; b(x) = 0$ and $\{a(x) = 0$ or undefined$\}$

1.63 Example: Let X be a non empty set. $3^X = \{ a / a : X \to 3 = \{0,1,2\}$ is a function$\}$. Then $(3^X, \wedge, *, (-)^{\sim}, (-)_\pi, 1)$ is an A^* -algebra where $\wedge, *, (-)^{\sim}, (-)_\pi$ are defined as follows:

(i) $(a \wedge b)(x) = a(x) \wedge b(x) \; for \; all \; x \in X$

(ii) $(a \vee b)(x) = a(x) \vee b(x)\ for\ all\ x \in X$

(iii) $a^{\sim}(x) = (a(x))^{\sim}\ \ for\ all\ x \in X$

(iv) $a_{\pi}(x) = (a(x))_{\pi}\ for\ all\ x \in X$

(v) $(a * b)(x) = a(x) * b(x) for\ all\ x \in X$

(vi) $1(x) = 1\ for\ all\ x \in X$

P. Koteswara Rao [5, chapter 2] in his thesis proved the following theorem.

1.64 Theorem: Let $(B, \wedge, (-)', 0)$ be a Boolean algebra. Then $\mathcal{A}(B) = \{(a, b)/a, b \in B, a \wedge b = 0\}$ becomes an A^*- algebra, where the A^*- algebraic operations $\wedge, \vee, *, (-)^{\sim}, (-)_{\pi}$ are defined as follows:

For $a = (x_{\pi}, x^{\#})\ , b = (y_{\pi}, y^{\#}) \in \mathcal{A}(B)$

(i) $a \wedge b = (x_{\pi}y_{\pi}\ , x_{\pi}y^{\#} + x^{\#}y_{\pi} + x^{\#}y^{\#})$

(where juxtaposition, +, $(-)'$ respectively $\wedge, \vee, (-)'$ in Boolean algebra B)

(ii) $a \vee b = (x_{\pi}y_{\pi} + x_{\pi}y^{\#} + x^{\#}y_{\pi}\ , x^{\#}y^{\#})$

(iii) $a^{\sim} = (x^{\#}, x_{\pi})$

(iv) $a_{\pi} = (x_{\pi}, (x_{\pi})')$

(v) $a * b = (x_{\pi}, (x_{\pi})'y^{\#})$

(vi) $1 = (1,0)\ , 0 = (0,1)\ , 2 = (0,0)$

1.65 Theorem: $(B, \wedge, \vee, (-)', 0,1)$ is a boolean algebra. Define $\approx$ on $B \times B$ as follows:

$(a, b) \approx (c, d)$ if and only if $a = c\ ,\ a'b = c'd$ .Then

(i) $\approx$ is an equivalence relation on $B \times B$.

$< a, b > = \{(c, d) \in B \times B / (a, b)\ \approx (c, d)\}$

Let $\mathcal{A}_B = B \times B / \approx = \{< a,b >/(a,b) \in B \times B\}$

(ii) For every $< a,b > \in \mathcal{A}_B$ there exists $e,f \in B, ef = 0$ such that $< a,b > = < e,f >$.

(iii) Define $\wedge, \vee, *, (-)_\pi, (-)', 1, 0, 2$ on $\mathcal{A}_B$ as follows

Assume $\mathcal{A}_B = \{< a,b > / a,b \in B, ab = 0\}$

(a) $< a,b > \wedge < c,d > = < ac, ad + bc + bd >$ (where juxtaposition, + , $(-)^{\sim}$ respectively $\wedge, \vee, (-)^{\sim}$ in the Boolean Algebra B)

(b) $< a,b > \vee < c,d > = < ac + ad + bc, bd >$

(c) $< a,b >^{\sim} = < b,a >$

(d) $< a,b >_\pi = < a,a' >$

(e) $< a,b > * < c,d > = < a, a'd >$

(f) $1 = < 1,0 > , 0 = < 0,1 > , 2 = < 0,0 >$

(g) $< a,b > * < c,d > = < a, a'd >$

(h) $1 = < 1,0 > , 0 = < 0,1 > , 2 = < 0,0 >$

Then $(\mathcal{A}_B, \wedge, \vee, *, (-)^{\sim}, (-)_\pi, 0, 1, 2)$ is an A^*-algebra.

Proof: (i) Suppose $(a,b) \in B \times B$

Since $a = a, a'b = a'b$. Therefore $(a,b) \approx (a,b)$

Therefore $\approx$ is reflexive.

Suppose $(a,b) \approx (c,d)$

$\Rightarrow a = c , a'b = c'd$

$\Rightarrow c = a , c'd = a'b$

Therefore $(c,d) \approx (a,b)$

Therefore $\approx$ is symmetric.

Suppose $(a,b) \approx (c,d), (c,d) \approx (e,f)$

$$\Rightarrow a = c\,, a'b = c'd\,, c = e\,, c'd = e'f$$

$$\Rightarrow a = e\,, a'b = e'f$$

$$\Rightarrow (a,b) \approx (e,f)$$

Therefore $\approx$ is transitive.

Therefore $\approx$ is an equivalence relation on $B \times B$.

$< a,b >$ = $\{(c,d) \in B \times B / (a,b) \approx (c,d)\}$ is called the equivalence class containing (a,b).

(ii) Suppose $< a,b > \in \mathcal{A}_B$

Let $e = a\,, f = a'b$

Clearly $< a,b >$ = $< e,f >$ (since $a = e\,, a'b = e'f$)

$$\mathcal{A}_B = \{< e,f > / e,f \in B\,, ef = 0\}$$

(iii) 1_π = $< 1,0 >_\pi$ = $< 1,1' >$ = $< 1,0 >$ = 1

$$< a,b >_\pi = < a,a' >$$

$$< a,b >_{\pi\pi} = < a,a' >_\pi = < a,a' > = < a,b >_\pi$$

$$B(\mathcal{A}_B) = \{< a,b >_\pi / (a,b) \in B \times B\}$$

$$= \{< a,a' > / a \in B\}$$

Therefore $B(\mathcal{A}_B) \cong B$

Therefore 1 def (i) to (iv) holds in $\mathcal{A}_B$.

$$(< a,b > \wedge < c,d >)_\pi = < ac\,, ad + bc + bd >_\pi$$

$$= < ac\,, (ac)' >$$

$$= < ac\,, a' + c' >$$

Therefore $(< a,b > \wedge < c,d >)_\pi = < ac\,, a' + c' >$

$$< a,b >_\pi \wedge < c,d >_\pi = < a,a' > \wedge < c,c' >$$

$$= < ac\ , ac' + a'c + a'c' >$$

$$= < ac\ , ac' + a' >$$

$$= < ac\ , c' + a' >$$

Therefore $(< a,b > \wedge < c,d >)_\pi = < a,b >_\pi \wedge < c,d >_\pi$

$$< a,b >^{\#} = (< a,b >_\pi \vee < a,b >_\pi^{\sim})^{\sim}$$

$$= (< a,a' > \vee < b,a >_\pi)^{\sim}$$

$$= (< a,a' > \vee < b,b' >)^{\sim}$$

$$= (< ab + ab' + a'b\ , a'b' >)^{\sim}$$

$$= (< a + a'b\ , a'b' >)^{\sim}$$

$$= (< a + b\ , a'b' >)^{\sim}$$

$$= < a'b'\ , a + b >$$

Therefore $< a,b >^{\#} = < a'b'\ , a + b >$

Clearly $< a,b >^{\sim\#} = < a,b >^{\#}$

$$< a,b >^{\sim} = < b,a >$$

$$< a,b >_\pi^{\sim} = < b,b' >$$

$$\left(< a,b >_\pi \vee < a,b >^{\#}\right)^{\sim} = (< a,a' > \vee < a'b'\ , a + b >)^{\sim}$$

$$= (< aa'b' + a(a + b) + a'a'b'\ , a'(a + b) >)^{\sim}$$

$$= (< 0 + a + ab + a'b'\ , a'b >)^{\sim}$$

$$= (< a + a'b'\ , a'b >)^{\sim}$$

$$= (< a + b'\ , a'b >)^{\sim}$$

$$= (< b', b >)^{\sim} \text{ since } ab = 0$$

$$= < b, b' >$$

Therefore $< a,b >_\#^{\sim} = (< a,b >_\pi \vee < a,b >^{\#})^{\sim}$

$$< a, b > * < c, d > = < a, a'd >$$

$$(< a, b > * < c, d >)_\pi = < a, a'd >_\pi = < a, a' >$$

$$< a, b >_\pi = < a, a' >$$

Therefore $(< a, b > * < c, d >)_\pi = < a, b >_\pi$

$$(< a, b > * < c, d >)^\# = < a, a'd >^\#$$

$$=< a'(a'd')', a + a'd >$$

$$=< a'(a + d'), a + a'd >$$

$$=< a'd' , a + d >$$

Therefore $(< a, b > * < c, d >)^\# = < a'd' , a + d >$

$$< a, b >_\pi^{\sim} \wedge < c, d >_\pi^{\sim\sim} = < a, a' >^{\sim} \wedge < d, d' >^{\sim}$$

$$= < a', a > \wedge < d', d >$$

$$= < a'd' , a'd + ad' + ad >$$

$$= < a'd' , a'd + a >$$

$$= < a'd' , d + a >$$

Therefore $< a, b >_\pi^{\sim} \wedge < c, d >_\pi^{\sim\sim} = < a'd' , \ d + a >$

Therefore $(< a, b > * < c, d >)^\# = < a, b >_\pi^{\sim} \wedge < c, d >_\pi^{\sim\sim}$

Suppose $< a, b >_\pi = < c, d >_\pi$, $< a, b >^\# = < c, d >^\#$

$$< a, b >_\pi = < c, d >_\pi \Rightarrow < a, a' > = < c, c' >$$

$$\Rightarrow (a, a') \approx (c, c')$$

$$\Rightarrow a = c \, , a'a' = c'c'$$

$$\Rightarrow a = c$$

$$< a, b >^\# = < c, d >^\# \Rightarrow < a'b' , a + b > = < c'd' , c + d >$$

$$\Rightarrow (a'b' , a + b) \approx (c'd' , c + d)$$

$$\Rightarrow a'b' = c'd' , (a'b')'(a + b) = (c'd')'(c + d)$$

$$\Rightarrow a + b = c + d$$

Consider $a + b = c + d$

$\Rightarrow a'(a + b) = a'(c + d) = c'(c + d)$ (since $a = c$)

$\Rightarrow a'b = c'd$ (actually $a'b = b, c'd = d$ since $ab = 0, cd = 0$)

Therefore $a = c, ab = cd \Rightarrow (a, b) \approx (c, d)$

$$\Rightarrow < a, b > = < c, d >$$

Therefore $< a, b >_\pi = < c, d >_\pi, < a, b >^\# = < c, d >^\#$

$$\Rightarrow < a, b > = < c, d >$$

Therefore $(\mathcal{A}_B, \wedge, \vee, (-)_\pi, (-)^\sim, 1)$ is an A^*-algebra.

Therefore every Boolean algebra B generates an A^*-algebra $\mathcal{A}_B = B \times B/\approx$.

One can see that for every Boolean algebra B, $\mathcal{A}_B \cong \mathcal{A}(B)$.

For, define $f: \mathcal{A}_B \to \mathcal{A}(B)$ by taking $f < a, b > = f(a, b)$ for all $< a, b > \in \mathcal{A}_B$

Then f is clearly well defined and it is an A^*-isomorphism.

Therefore $\mathcal{A}_B = \mathcal{A}(B)$.

1.66 Definition: A real valued function m on a Boolean algebra B is said to be a measure provided

(i) $0 \leq m(a) \leq \infty$ for every $a \in B$, and there exists an element $a_0 \in B$ such that $m(a_0) < \infty$.

(ii) $m(a \vee b) = m(a) + m(b)$ whenever $a \wedge b = 0, a, b \in B$.

1.67 Note: A measure P on a Boolean algebra B is called a normed measure (probability measure or simply probability) on B if $P(1) = 1$ where 1 is unit element in B.

2. Main Results

2.1 Definition: Suppose $(A,\wedge,*,(-)_\pi,(-)^\sim,1,0)$ is an $A^*-algebra$. A real valued function $P: A \longrightarrow \mathcal{R}$ is called normed measure on A if

(i) $P(a) \geq 0$ for every $a \in A$, $P(a) = 0\ iff\ a = 0$

(ii) $P(a_\pi) + P(a^\#) + P(a^\sim{}_\pi) = 1$

(iii) $P(a \vee b) = P(a_\pi b_\pi) + P(a^\sim{}_\pi b_\pi) + P(a_\pi b^\sim{}_\pi) + P(a^\# \vee b^\#)$

(i) $P(a) \geq 0$ for every $a \in A$, $P(a) = 0\ iff\ a = 0$

(ii) $P(a_\pi) + P(a^\#) + P(a^\sim{}_\pi) = 1$

(iii) $P(a \vee b) = P(a_\pi b_\pi) + P(a^\sim{}_\pi b_\pi) + P(a_\pi b^\sim{}_\pi) + P(a^\# \vee b^\#)$

2.2 Note: (i) $P(a) = P(a_\pi) + P(a^\#)$ for every $a \in A$.

For take $b = a$ also in 2.1(iii).

(ii)If $a \wedge b = 0$, then $P(a \vee b) = P(a_\pi) + P(b_\pi)$.

For $a \wedge b = 0 \Longrightarrow a_\pi b_\pi = 0$ and $a^\# = 0, b^\# = 0$ and use 2.1(iii)

(iii) $P(a * b) = P(a_\pi) + P(a_\pi{}^\sim b^\sim{}_\pi{}^\sim)$

(iv) $P(a \wedge b) = P(a_\pi b_\pi) + P(a^\# \vee b^\#)$

(v)$P(1) = 1$. for take a=1 in 2.2(i)

(vi)$P(2) = 1$. for take a=2 in 2.2(i)

2.3 Note: On $B(A)$, P is a probability measure.

Proof: Suppose $e, f, g \in B(A)$

Clearly $P(e) \geq 0\ \forall e \in B(A)$

And $P(e) = 0 \; iff \; e = 0$

Suppose $e \wedge f = 0, e, f \in B(A)$

$P(e \vee f) = P(e) + P(f).$

2.4 Note: Suppose $e_1, e_2, \dots, e_n \in B(A), e_i \wedge e_j = 0 \; , i \neq j . P(e) + P(e^{\sim}) = 1$

Then $P\left(\bigvee_{i=1}^{n} e_i\right) = \sum_{i=1}^{n} P(e_i).$

i. $e \leq f \Rightarrow P(f \wedge e^{\sim}) = P(f) - P(e)$

In general $P(f \wedge e^{\sim}) = P(f) - P(f \wedge e)$

ii. $e \vee f = (e \wedge f^{\sim}) \vee (e^{\sim} \wedge f) \vee (ef)$

iii. $P(e \vee f) = P(e) + p(f) - P(e \wedge f)$

v. $P\left(e \wedge \left(\bigvee_{i=1}^{n} e_i\right)\right) = \sum_{i=1}^{n} P(e \wedge e_i) \; , e_i \wedge e_j = 0 \; ,$

$i \neq j \; , e_1, e_2, \dots, e_n, e \in B(A)$

vi. $P\left(\bigvee_{i=1}^{n} e_i\right) \leq \sum_{i=1}^{n} P(e_i)$

2.5 Theorem: Every probability measure on a Boolean algebra B extends a normed measure on $A(B)$

Proof: $A(B) = \{(a, b) / a, b \in B \; , a \wedge b = 0\}$

$A(B)$ becomes an A^*-algebra, where $\wedge, \vee, *, (-)^{\sim}, (-)_{\pi}, 1$ are defined as follows:

For $a = (a_{\pi} \; , a^{\#}), b = (b_{\pi} \; , b^{\#}) \in A(B)$

(i) $a \wedge b = (a_{\pi} b_{\pi} \; , a_{\pi} b^{\#} + a^{\#} b_{\pi} + a^{\#} b^{\#})$

(ii) $a \vee b = (a_{\pi} b_{\pi} + \; a_{\pi} b^{\#} + a^{\#} b_{\pi} \; , a^{\#} b^{\#})$

(iii) $a * b = (a_{\pi} \; , a'_{\pi} b^{\#})$

(iv) $a^{\sim} = (a^{\#}, a_{\pi})$

(v) $a_{\pi} = (a_{\pi}, a'_{\pi})$

(vi) $1 = (1,0), 0 = (0,1), z = (0,0)$

(where juxtaposition $., +, (-)'$ respectively $\wedge, \vee, (-)'$ in Boolean algebra)

Suppose P is a normed measure on B.

Define $\bar{P}: A(B) \to \mathcal{R}$ as follows:

Let $a = (a_{\pi}, a^{\#}) \in A(B)$.

$$\bar{P}(a) = P(a_{\pi}) + P(a^{\#})$$

$$\bar{P}(e) = P(e) \quad \forall e \in B$$

Clearly $\bar{P}(a) \geq 0$

$$\bar{P}(a) = 0 \iff P(a_{\pi}) + P(a^{\#}) = 0$$

$$\iff P(a_{\pi}) = 0, P(a^{\#}) = 0$$

$$\iff a_{\pi} = 0, a^{\#} = 0$$

$$\iff a = 0$$

$$\therefore \bar{P}(a) = 0 \iff a = 0$$

$$\bar{P}(a_{\pi}) + \bar{P}(a^{\#}) + \bar{P}(a^{\sim}{}_{\pi}) = P(a_{\pi}) + P(a^{\#}) + P(a^{\sim}{}_{\pi})$$

$$= P(a_{\pi} \vee a^{\#} \vee a^{\sim}{}_{\pi}) = P(1) = 1$$

$$\therefore \bar{P}(a_{\pi}) + \bar{P}(a^{\#}) + \bar{P}(a^{\sim}{}_{\pi}) = 1$$

$$\bar{P}(a \vee b) = P((a \vee b)_{\pi}) + P((a \vee b)^{\#})$$

$$= P(a^{\sim}{}_{\pi} b_{\pi} \vee a_{\pi} b^{\sim}{}_{\pi} \vee a_{\pi} b_{\pi}) + P((a \vee b)^{\#})$$

$$= P(a^{\sim}{}_{\pi} b_{\pi}) + P(a_{\pi} b^{\sim}{}_{\pi}) + P(a_{\pi} b_{\pi}) + P(a^{\#} \vee b^{\#})$$

$$= \bar{P}(a_{\pi} b_{\pi}) + \bar{P}(a^{\sim}{}_{\pi} b_{\pi}) + \bar{P}(a_{\pi} b^{\sim}{}_{\pi}) + \bar{P}(a^{\#} \vee b^{\#})$$

$$\therefore \bar{P}(a \vee b) = \bar{P}(a_\pi b_\pi) + \bar{P}(a^{\sim}{}_\pi b_\pi) + \bar{P}(a_\pi b^{\sim}{}_\pi) + \bar{P}(a^{\#} \vee b^{\#})$$

$\therefore \bar{P}$ is a normed measure on $A(B)$.

2.6 Definition: Suppose X is a set, a class $F^* = \{(A_1, A_2) / A_1, A_2 \subseteq X,$ $A_1 \cap A_2 = \emptyset\}$ is called an A^*-field of subsets of X if

(i) $(X, \emptyset) \in F^*$

(ii) $(A_1, A_2) \in F^* \Rightarrow (A_2, A_1) \in F^*)$

(iii) $(A_1, A_2), (B_1, B_2) \in F^*$

$\Rightarrow (A_1B_1, A_1B_2 + A_2B_1 + A_2B_2) \in F^*$

Juxtaposition and Addition stand for intersection and union of sets.

(iv) $(A_1, A_2), (B_1, B_2) \in F^* \Rightarrow (A_1, A_1^c B_2) \in F^*$

2.7 Theorem: Suppose F is a σ-algebra of subsets of a set X. Then $F^* = \{(A, B)/A, B \in F, A \cap B = \emptyset\}$ is an A^*-algebra of sets of X.

Proof: Since $X \in F, \phi \in F$ & $X \cap \phi = \emptyset \Rightarrow (X, \emptyset) \in F^*$

Suppose $(A_1, A_2) \in F^*$

$\Rightarrow A_1, A_2 \in F, A_1 \cap A_2 = \emptyset$

$\Rightarrow A_2, A_1 \in F, A_2 \cap A_1 = \emptyset$

$\Rightarrow (A_2, A_1) \in F^*$

Suppose $(A_1, A_2), (B_1, B_2) \in F^*$

$\Rightarrow A_1, A_2, B_1, B_2 \in F, A_1 \cap A_2 = \emptyset, B_1 \cap B_2 = \emptyset$

$\because A_1B_1, A_1B_2 + A_2B_1 + A_2B_2 \in F$ and $A_1B_1 \cap (A_1B_2 + A_2B_1 + A_2B_2) = \emptyset$

$\Rightarrow (A_1B_1, A_1B_2 + A_2B_1 + A_2B_2) \in F^*$

Suppose $(A_1, A_2), (B_1, B_2) \in F^*$

$\Rightarrow A_1, A_2, B_1, B_2 \in F$ and $A_1 \cap A_2 = \emptyset, B_1 \cap B_2 = \emptyset$

$\Rightarrow A_1 A_1^c B_2 \in F$ and $A_1 \cap (A_1^c B_2) = \emptyset$

$\Rightarrow (A_1, A_1^c B_2) \in F^*$

F^* is an A^*-field of subsets of X.

$\therefore F^*$ is an A^*-algebra.

2.8 Theorem: Every probability measure on a σ-algebra of subsets of a set X extends to a normed measure on F^*.

Proof: $F^* -$ an A^*-algebra and $A(F) = F^*$ and $B(F^*) \cong F$.

Suppose P is a probability measure on F.

Then P can be extended to a normed measure $\bar{P}$ on F^* (by 4.26 theorem)

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PHILOSOPHY OF INDIAN CONSTITUTION FOR EDUCATION, EQUALITY & SOCIAL JUSTICE

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Abstract:

The idea of fundamental human needs includes drawing a rundown of foundational needs of both, physiological and social. The term social equity infers a political and social equalization of the assorted interests in the public arena. Social equity is a rule that sets out the establishment of a general public taking into account uniformity, freedom and organization. The essential point and target of society is the development of individual and improvement of his identity.

Keywords: Indian Constitution, Education, Equality, Right to Social Justice, Weaker Sections

Introduction:

The Indian Constitution instituted in 1949 and embraced in 1950 cherishes equity and social equity as the cardinal standards of the Indian fair framework. The extraordinary component of the Indian Constitution is that while it maintains the standard of equity under the watchful eye of law, it accommodates certifiable prejudicial activities to inspire the social, monetary and instructive prosperity of hindered gatherings. The Constitution perceives the Scheduled Castes (SCs), Scheduled Tribes (STs) and instructively Other Backward Classes (OBCs), Minorities and Women as distraught gatherings. A definitive goal of the Constitution Framers was to set up a casteless society inside the system of a welfare state by bit by bit dispensing with standing progression, position refinement and rank shame and in this way to guarantee the pride of the individual and correspondence of status

among every one of the subjects of India. The Preamble of the Constitution guarantees Justice, social, financial and political, and Equality of status and of chance with a perspective to advancing among all subjects Fraternity, guaranteeing the respect of the individual and the solidarity and trustworthiness of the country.[1] These standards are obviously reflected in various provisos of the Constitution. Article 14 ensures correspondence in the witness of the law and the equivalent assurance of law to all persons. Article 15(1) denies victimization any subject on grounds of religion, race, standing or sex. Article 16(1) ensures fairness of chance for all subjects in matters identifying with business or arrangement to any office under the State.

So as to make the Fundamental Rights alluded to above important to the socially burdened individuals of this nation, especially the individuals who had been gravely abused and oppressed to social treacheries for quite a long time, the Constitution creators made a few procurements in the constitution to raise their level so they may live with poise and regard. Article 17 accommodates cancelation of untouchability, and the authorization of any handicap emerging from it was made culpable as an offense as indicated by law.

Article 15(4) was not there at first in the Constitution when it was established and was acquainted as a first revision with the Constitution. It empowered the legislature to make uncommon procurements for the headway of in reverse classes including the Scheduled Castes (SCs) and Scheduled Tribes (STs). According to

[1] Padma Velaskar (2006) National Commitment to Education of the Dalits :A Critical Commentary on the Report of the Education Commission (1964-66) Paper presented at National Seminar on "The Education Commission: Revisiting the Commission's Premises, Vision and Impact on Policy Formulation" organized by NUEPA, 16-18 December 2006, New Delhi.

Article 16(4), the Government can reserve a spot for any retrogressive class of residents.

Political representation was ensured for SCs and STs through the proportionate reservation of seats in all chose administrative bodies from Parliament to Village Councils. Not just that, the Government of India founded a system of 'Compensatory segregation', an Indian adaptation of governmental policy regarding minorities in society, which accommodates 15% reservation to SCs and 7.5% reservation to STs in every open administration and in admissions to all state funded colleges and universities. Article 46 of the Constitution plainly expresses that the State should advance with extraordinary consideration the instructive and monetary interests of the weaker segments of the general population, and, specifically, of the SCs and the STs, and might shield them from social treachery and all types of misuse. The 86th Amendment to the Constitution embeddings Article 21 An, in 2002, making basic instruction a major right is going to have beneficial outcome on the training of SCs, STs, OBCs and ladies. [2]

Plus, the National Policy on Education (1968) calls for strenuous endeavors to rectify provincial uneven characters and between gathering incongruities in training. Strengthening the 1968 Resolutions, the National Policy on Education and Program of Action (1968/1992) lay accentuation on the expulsion of variations and evening out of instructive open doors by taking care of the particular needs of the individuals who have been denied correspondence in this way. Both the Policies have managed the instructive needs of the SCs, STs, Women and Minorities in extraordinary subtle element with an uncommon sympathy toward ignored gatherings like traveling tribes

[2] Beteille, A. (2000). "The Scheduled Castes: An Inter-Regional Perspective", in A. Beteille (ed.), *Journal of Indian School of Political Economy,* 12 (3 and 4): 255–60.

and de-informed tribes. Taking into account the sacred duty and strategy mandates, arranged endeavors have been made since autonomy to advance instructive improvement in impartial way. Thusly, there has been extensive change in the instructive status of the denied bunches.

Defensive Measures for Inclusivity

Other Backward Classes (OBCs)

The Government of India set up the Kaka Kelkar Commission in 1952 with a perspective to distinguishing the OBCs and giving them comparable advantages as it had stretched out to SCs and STs. The Commission presented its report in 1955 however its proposals were challenged in the courts until the Supreme Court decided in 1963 that aggregate reservation, comprehensive of the quantum for SCs and STs couldn't surpass half. Nothing happened for the following 15 years. It was in 1978 that the Government of India chose to set up the Second Backward Classes Commission under the Chairmanship of Mr. B.P. Mandal.[3] The Commission went for giving governmental policy regarding minorities in society approaches to in reverse and hindered stations so as to review rank segregation. The Commission utilized upwards of 11 markers to decide the backwardness. The Commission recognized 3,743 standings and groups, constituting 52% of the aggregate populace, as OBCs. Driven by the 1963 Judgment of the Supreme Court, the Commission prescribed 27% reservation to OBCs in all administrations and open division endeavors under the Central Government. It likewise prescribed 27% reservation to OBCs in admission to every single open foundation of higher learning. Despite

[3] Jeffery, C. P. Jeffery and R. Jeffery (2005),' Broken Trajectories: Dalit Young Mend and Formal Eduation', in Radhika Chopra and Patricia Jeffery (Eds.) *Educational Regimes in Contemporary India*, pp. 166-185, Konrad Adenauer Stiftung and Sage, New Delhi.

the fact that the report of the Commission was submitted in 1978, it took 12 years for the legislature to execute its proposals. In August 1990, The Government of India reported the usage of the Commission's suggestion. The declaration met with colossal resistance, and a writ appeal was recorded in the Supreme Court against the usage of the Commission's suggestions. The Supreme Court, be that as it may, in its judgment (November 16, 1992) maintained 27% reservations in administrations for OBCs. In this way, the Central Government presented the Bill. The Central Educational Institutions (Reservation in Admission) Bill No.76 of 2006 in the Parliament made 93rd Constitutional Amendment which accommodated the reservation in affirmation of the understudies having a place with SCs, STs and OBCs to instructive organizations set up, kept up or helped by the Central Government, and for matters associated therewith or accidental thereto. The Bill was passed by both the Lower House and the Upper House of the Parliament on December 14 and 18, 2006 individually. No sooner had the Bill got a consent of the President and turned into the Central Educational Institutions (Reservation in Admissions) Act, 2007 than its Constitutional legitimacy was tested in the Supreme Court. The Supreme Court in its judgment conveyed on April 10, 2008 maintained the 93rd Amendment to the Constitution empowering the Government to save 27% for every penny OBC amount in all halfway subsidized establishments of higher learning. [4]

Minority Muslim Community

The muslim group in India constitutes 13.43% of the aggregate populace. Article 29 gives the minorities the privilege to moderate their dialect, script and culture. Article 30 gives the privilege to the

[4] World Bank (2001a and 2001b). 'Constructing Knowledge Societies: New Challenges for Tertiary Institutions, Volumes I and II.' Draft paper, Education Group: Human Development Network, World Bank.

minorities to set up and control instructive foundations of their decision. It has been communicated that amongst the minorities which have endured instructively, the feeling of disparity might be never-ending as a consequence of separation that the minority may confront because of distinction in 'character'. In this association, the Government of India is starting a few measures to realize subjective change in the status of the muslim group. The present government in the middle has made another 'Service of Minority Affairs' which has been endowed with the obligation of general strategy, arranging, coordination, assessment and survey of the administrative and formative projects of the minority groups. The same government through an Act of Parliament has likewise settled the National Commission for Minority Educational Institutions on eleventh November, 2004 to exhort the focal or any state government on any inquiry identifying with instruction of minorities. It needs to look particular protestations in regards to hardship or infringement of privileges of minorities to set up and regulate instructive foundations of their decision and question relating association to a booked college and needs to do different acts and things essential, coincidental or helpful for the achievement of all or any of the objects of the commission.[5]

The administration has likewise set up a 'National Monitoring Committee for Minorities Education (NMCME)' under the chairmanship of Union Minister for Human Resource Development (MHRD) in the year 2004. A Standing Committee of the NMCME has additionally been constituted to take care of the issues identified with the instruction of minorities on a progressing premise. Not just that the Government of India likewise set up a higher controlled Committee to comprehend social, monetary and instructive status of the muslim

[5] National Commission for Scheduled Castes and Scheduled Tribes, Sixth Report, 1999-2000 &2000-2001, Government of India, New Delhi.

group in India under the Chairpersonship of Justice Rajindar Sachar in 2005. The report merges, groups and examinations data concerning the states, the areas, the regions and squares where muslims of India generally live; land example of their monetary exercises; wage levels; level of their financial improvement; relative offer in broad daylight and private part job; extent of OBCs from the muslim group altogether OBC populace. Data on these viewpoints has been demonstrated in the report of this board to recognize zones of mediations by the legislature to deliver pertinent issues identifying with the social, financial and instructive status of the muslim group. Plus, the Prime Minister has additionally presented another 15 point program, for the welfare of minorities, which identify with upgrading open doors for their training, evenhanded offer in monetary exercises and vocation, enhancing the states of living of minorities and counteractive action and control of public mobs.

Articles 350 (A) supporters guideline in native language at essential stage and Article 350 (B) accommodates an exceptional officer to shield the interests of phonetic minorities. Further, the Constitution of India in its 'Union', "State" and 'Simultaneous List' characterizes the forces and elements of the Center and the States. Under the Constitution initially received, instruction was fundamentally a State subject. Since this prompted differential instructive advancement over the States, training was exchanged to the Concurrent List through a Constitutional Amendment in 1976, which infers important organization between the Center and the States. Despite the fact that this movement did not change the part and obligation of the States, it gave the Central Government a noteworthy part in reinforcing the instruction framework in the nation. From that point forward, countless and projects as agreed arrangement intercessions have been propelled by the Central Government in a joint effort with the State Governments to defeat the insufficiencies preventing the instructive

advancement. Thusly, the age-old oppressive practices have about vanished. The instructive status of negligible gatherings has incredibly enhanced contrasted with the circumstance before nation's freedom. [6]

Current Educational Scenario

Populace and Literacy

India is a nation with more than one billion individuals. Its populace has encountered higher development rates since autonomy generally inferable from declining tyke and grown-up death rates as an aftereffect of change in wellbeing offices and mindfulness. Table 1 demonstrates the development and organization of populace in India. It might be noticed that the organization of populace is somewhat changing for SCs and STs. The extent of SCs expanded from 14.7 for every penny in 1961 to 16.2 for every penny in 2001. Correspondingly the extent of ST likewise somewhat expanded from 6.8 to 8.2 for each penny somewhere around 1961 and 2001. The education rate of populace including those of peripheral gatherings has enhanced a considerable measure. For instance, if there should arise an occurrence of SCs, the proficiency rate has expanded from somewhat more than 10 for each penny in 1961 to 55 for every penny in 2001. In the event of STs, it expanded from under 9 for every penny to 47 for every penny amid the same time frame. The procedure of accumulation of information on financial and instructive status of minority muslim group has initiated from 2001 Census. As per the most recent figures, muslim education remains at 59.13 for every penny. The education rate concerning all out populace has expanded from 28.3 for every penny to 65.4 for each penny somewhere around 1961 and 2001. In spite of the fact that these are praiseworthy accomplishments, the nation needs to try coordinated endeavors to make all individuals educated.

[6] Ministry of Human Resource Development (Various Years). *Selected Educational Statistics*, MHRD, New Delhi.

Instructive Attainment of Population matured 15 years or more

As said before, stretching out instructive offices to negligible gatherings frames the center of methodology of the Government of India to operationalise the Constitutional procurements of balance of chance and social equity. The state has been endeavoring to give primary schools in every single home with uncommon thoughtfulness regarding the SC and ST prevailing residences. The quantity of optional and advanced education organizations has additionally been on an expansion to give simple access. Further, grants, expense waivers, impetuses, lastly reservation procurements have been initiated to accomplish social equity and fairness of chance. One unsettled inquiry is the thing that effect these measures have on the instructive qualifications controlled by various social gatherings. Is the circulation of training qualifications impartial?[7]

An examination of instructive fulfillments of grown-ups, over 15 year of age, of different social gatherings hurls some intriguing patterns. Figure 1 portrays extent of individuals above 15 years old who have a specific level of instruction by social gatherings, sexual orientation and provincial and urban. It unambiguously builds up wide imbalances between social gatherings. It additionally indicates a chain of command kind of thing between social gatherings in the ownership of instructive accreditations. At the base end are ST provincial females with more than 70 for each penny ignorant. The extent of ST rustic females with optional and higher capability is totally miniscule with 4.4 for every penny mark. At the flip side of range are urban different guys with somewhat more than 60 for every penny having optional or more

[7] Rao Bhaskara N and Kulkarni Suresh Disparities in School facilities in India: The Case of Scheduled Castes and scheduled Tribe Children. Journal of Educational Planning and Administration, Vol XII, Number2, April 2016.

capabilities. The unskilled people constitute a miniscule 7.5 for each penny among urban different guys. Figure 1 likewise demonstrates that the instructive status of SCs and STs especially females living in rustic territories has not changed much as critical extents of them are either ignorant or have absolute minimum instructive achievements.

Additionally records some positive effect of strategy mediations and different advancements on instructive accomplishment of minor gatherings. For instance, higher rate of urban ST and SC guys, 40 and 30.4 for every penny separately, have optional or more capabilities contrasted with just 31 for every penny among country different guys (i.e. non SC and ST). Notwithstanding, urban SC and ST guys are a path behind the urban different guys. This makes it abundantly clear that in spite of huge development of instructive offices, the instructive achievements of negligible gatherings keep on being low[8].

Development of Educational Institutions

The instructive framework has extraordinarily extended since freedom to take into account the requirements of all areas of society. Instructive extension was gone for addressing the necessities of developing economy and to encourage correspondence among various segments of populace. As needs be, the instructive needs of negligible gatherings like SCs and STs were tended to by opening instructive foundations at rudimentary and auxiliary level in homes ruled by them. The grade schools have developed by about four folds from 210 thousand in 1950-51 to 772 thousand schools in 2005-06. Also the quantity of upper essential and high/higher optional schools has gone up by more than 20 times amid the same time frame. The upper grade schools have gone up from 13 thousand schools to 288 thousand. The high/higher auxiliary

[8] Sachdev, Menraj (n.a.). 'The social Perspective's of India's Higher Education System.' Faculty of education and Social Work, University of Sydney. www.aare.edu.au/04pap/**s**ac04343.pdf.

schools have gone up from 7.4 thousand to 160 thousands amid the same time frame.

The advanced education part has additionally seen a precarious increment amid this period. The schools have passed by more than 30 times from simply 578 universities in 1950-51 to almost 21 thousand universities in 2005-06. Colleges and different organizations of higher taking in have additionally gone up from 28 in 1950-51 to 416 in 2005-06. The training segment is further ready to develop amid the XI Five Year Plan (FYP) which goes for comprehensive development. The development of instructive open doors at all levels of training with an accentuation on peripheral gatherings is the way to procedures embraced to advance comprehensive development.

Enrolment at Primary and Upper Primary Stages

The endeavors made by the Government of India to enhance the investment levels of offspring of SCs and STs is reflected in the expanded enrolment and higher development rates of enrolment at essential and upper essential levels of instruction. SC and ST enrolment at essential and upper essential levels of training and also for the whole rudimentary instruction amid the period 1980-81 to 2005-06 is displayed in Tables 3 and 4. The information uncover a steady increment in enrolment for both young men and young ladies. The SC enrolment at essential level has expanded by 2.3 times from 11 million in 1980-81 to 25.2 million in 2005-06. Amid the same time frame, ST enrolment at essential level has expanded by three times. It has expanded from 4.7 million in 1980-81 to 14.2 million in 2005-06. It is cheering to note that at essential level the enrolment of SCs and STs has developed at much higher pace by 2.3 and 3.0 times individually contrasted with 1.8 times regarding enrolment of overall public between 1980-81 and 2005-06. The information additionally uncovers that SC and ST enrolment at essential level has expanded at a yearly

rate of development of 3.38% and 4.55% separately. It is additionally promising to note that development rate if there should be an occurrence of young lady's enrolment at essential level is much higher than the aggregate enrolment concerning SCs and STs.[9] Further, it is watched that SC and ST enrolment has enlisted higher development rate at upper essential level than at the essential. The SC enrolment at upper essential level has expanded at a yearly development rate of 5.82% while that of ST at 7.46%. In total terms, SC enrolment at upper essential level has expanded from 2.22 million in 1980-81 to 9.14 million in 2005-06; in this way demonstrating an expansion of more than 4 times. The ST enrolment at upper essential level has expanded from 0.74 million in 1980-81 to 4.48 million in 2005-06 in this way enrolling somewhat more than 6 times development.

Rudimentary Education

Additionally, the enrolment at rudimentary level likewise expanded complex. For instance, the enrolment of SCs and STs expanded by 3.5 and 2.6 times individually contrasted with 2.0 times for all inclusive community between 1980-81 and 2005-06. The extent of SCs in the aggregate enrolment expanded from 14 for every penny in 1980-81 to 19 for each penny and that of STs from 5.71 to 10.11 amid the same time frame. The higher development rates of enrolment of SCs and STs may lessen the social crevices. [10]

Optional Education

The optional instruction is rising as one of the basic zones of activity in the changing worldwide political economy. The entrance to and

[9] Government of India (1956). The Backward Classes Commission, 1956 (Kelkar Commission), Volumes 4, New Delhi.

[10] Jeffery, C. P. Jeffery and R. Jeffery (2005), Reproducing difference? Schooling, Jobs, and Empowerement in Utar Pradesh, India' *World Development* Vol. 33, No. 12, pp. 1074-1742

disparities at auxiliary training are found to decide the resulting life chances (Jaffery, 2005). Shockingly, the spread of auxiliary instruction is meager. It is, along these lines, important to look at who is getting optional training and who is most certainly not. Table 5 gives the development of enrolment in auxiliary instruction by social gatherings. It merits saying that the enrolment of peripheral gatherings in auxiliary training is developing at a quicker rate than the overall public. For instance, the enrolment of SC and ST young ladies is developing by more than 9 for every penny for each annum contrasted with somewhat more than 6 for each penny in the event of young ladies of overall public. Thus, the enrolment of SCs and STs is developing at a higher rate of more than 6 for each penny for every annum contrasted with somewhat higher than 5 for each penny if there should be an occurrence of all inclusive community. In total terms, the development of enrolment is staggering. It tripled between 1980-81 and 2005-06 from 11 millions to 38.45 million. In a comparable vein the enrolment of SCs and STs additionally expanded by 4.5 and 6.3 times from 1.2 and 0.3 million to 5.6 and 2.2 million separately amid the same time frame.

Gross Enrolment Ratio at School Level

The Gross Enrolment Ratio (GER) is one unrefined pointer that gives some thought regarding the scope of comparing age populace at various levels of school training. Despite the fact that the GER has been expanding since autonomy, it misses the mark concerning desires and the requirements of developing economy. The complex increment in enrolment is reflected in the generous change of GER which for SCs and STs is well more than 100%. Computational and information base issues make it hard to infer any important patterns in what gives off an impression of being a somewhat aimless development in GER at essential level of training. Be that as it may, one unmistakable pattern, which one can observe, is the expansive scale support of offspring of SCs and STs in essential instruction. The high GER values for both SCs

(118%) and STs (126%) stand affirmation to this. It is fascinating to note that the current GER values in admiration of SCs and STs even surpass the GER of all inclusive community (109%) Table 6). Unnecessary to say that a higher GER for minimized segments, for example, SC and ST populace may not as a matter of course be translated as more elevated amounts of investment of relating age kids as a result of under-age and over-age youngsters and frequently it is the kids having a place with these underestimated areas who have a tendency to be over-matured comparing to the evaluation[11].

Conclusion:

It scarcely needs any notice that any dynamic common society would without a doubt require that all people are dealt with equivalent and with nobility and that all must be upheld minus all potential limitations conceivable advancement. Such a conviction would clearly warrant a shrewd governmental policy regarding minorities in society strategy on the grounds of social equity and value. Here, one needs to realize that while access could be guaranteed in an assortment of ways, it is the correspondence of chance which is significantly more imperative than whatever else as it requires the backing of entire scope of antecedental variables beginning from educational programs to teaching method, differential inputs, evaluation, remediation, criticism, state of mind, institutional consideration, and so forth.

It may not be out of the setting to specify that by overlooking less favored kids, who are more in number and whose ability stays undiscovered, the framework needs to oblige less skilled individuals from advantaged class. All the while, it is the framework which gets tormented with clumsiness. This depends on a known reason that ability is uniformly disseminated in a sizeable society. In this way, the

[11] Bakshi, P.M.(2003): The Constitution of India, *Universal Law Publishing Co. Pvt. Ltd. Delhi.*

individuals who contend that governmental policy regarding minorities in society, bringing about expanded investment of less favored segments, will bargain the quality ought not overlook that brilliance is a definitive result of differences. Truth be told, it is the last which is a fundamental condition for the previous. What it means is that quality without social value is as terrible as social value without quality.

Regardless of parcel of measures utilized for guaranteeing value, there are various key difficulties which keep on confronting the nation. There is a need a positive strategy which must permeate through to the last individual in the line. It ought to likewise guarantee the assorted understudy populace on every single grounds speaking to each area of the general public. Other than enhancing the entrance and achievement of every last one, it ought to likewise accommodate systemic reactions with a perspective to enhancing the nature of yield pointers. A scope of instructive worries that have been highlighted in this paper require various conceivable mediations that can realize balance and social equity to the nationals. Of them, the conspicuous ones resemble building up the idea of information to incorporate new regions of information and experience, inclusivity in selecting learning errands, academic practices that are cognizant to advancing cooperation, building fearlessness and basic mindfulness and an openness of connecting with the group.

It is obvious that the social setting of training in any nation shows various difficulties which must be tended to by approach producers both in its configuration and its execution. It must, in any case, be valued that the cardinal guideline of advancing uniformity is not just to accommodate rise to chance to all as far as access additionally in the condition for achievement.

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NICHE MARKET - OPPORTUNITY FOR THE SMALL MARKETER

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Abstract

Marketing is not always about big markets, huge budgets and mega promotions. A different and more focused type of Marketing exists wherein a product or service is offered to a select segment of consumers fulfilling their exclusive need and wants. This is known as Niche Marketing or Micromarketing where the goal of the marketer is to become a big fish in a small pond(the Niche) rather than trying to become small fish in a big pond(the mass market). A successful Niche marketer can certainly have a profitable business if he can identify a proper niche and come up with the right product offerings.

Key Words: Niche Markets, Advantages, Disadvantages, Strategies

" The customer in the niche has a distinct set of needs: they will pay a premium to the firm that best satisfies their needs; the niche is not likely to attract other competitors; the nicher gains certain economies through specialization: and the niche has size, profit and growth potential" (Kotler 2003)

A Niche market is a specialized segment for the marketer with specialized products. Basically niche marketing refers to competing within a narrowly defined market segment with a specialized offering. In essence the firm virtually becomes a 'big fish in a small pond". The firms competitive advantage comes both from its expertise(as it's a specialist) and from having a high market share (of a relatively small market segment). As a result, many potential competitors do not deem it viable to directly compete against niche marketers. Niches do not

found or created by identifying needs, wants, and requirements that are being addressed poorly or not at all by other firms, and developing and delivering goods or services to satisfy them.

Why do some firms become niche marketers?

Achieving success as a niche marketer is a challenging and risky strategy.

The major risk is that the firm is reliant upon a relatively small market and so committed that it does not have much diversity of revenue streams. So to some extent they are somewhat vulnerable to market downturns, new competitive entrants and substantial changes in the market environment.

Problems in Niche Marketing:

1. The expansion and growth of the firm depends solely on the expansion and growth of the market

2. Niche markets are sometimes unstable and occasionally suffer from the 'straw on fire effect' which refers to the market merely being a temporary solution to what is essentially a short term fad.

3. Unless the niche market firm can create a strong and sustainable USP then the firm will face challenges from larger companies who diversify into the niche market with one of their Product ranges

Therefore the question is that if niche marketing presents such problems and risks, then why would some firms choose to pursue such strategy?

The answer to this question is that being a niche marketer has a number of significant advantages to capitalize on as described below:

Advantages of Niche Marketing

1. Little/No Competition: A successful niche marketer can successfully dominate their targeted small segment market to such an extent that

they "own it" and virtually have no competition and the threat of new entrants is also very low.

2. Strong relationships: Niche marketers will build strong relationships with many of their Key customers over time, which further protects them from competitive threats.

3. Improved capabilities: As these firms are also usually experts in their field, they constantly add to their skill sets and capabilities. This builds their competitive position, making it even less likely that they will be challenged by new players.

4. High profit margins: Their profit margins tend to be higher because customers are less likely to consider the price as a determinant attribute – they are using the firm as they clearly provide the best solution for them.

The success of the Niche marketer depends on how effectively the required strategies have been followed. These strategies are highlighted below.

Strategies for Niche Marketers:

Niche marketers do not need to pursue the same marketing strategies of mass marketers.

Indeed it would not be productive or affordable to do so. Instead they need to have more focused and low cost approach to marketing.

1. Targeting carefully: Finding profitable new niches is difficult as the marketer is Looking for gaps in the market where there are no product or service offerings. simply finding the gaps is not enough and many unique consumer products have failed to find acceptance by consumers thereby making these gaps unprofitable.

2. Listening to consumers: For Niche marketers taking cognizance of consumer generated content on-line – reviews, ratings or just opinions about a product is very important.

They should not wait for the customers to talk to them but have to listen hard when customers talk about them which serves as a continuous feedback about their products.

They have to react quickly and take any necessary to fix the defects highlighted by the Customer. The most important thing is never to stop listening even after getting favourable comments.

3. Controlling Production Costs: Selling a large number of narrowly targeted products is difficult by all means. Standardization of the maximum number of parts of the products is a must as different variations of the products can be assembled for customers at less costs. The manufacturing processes can also be standardized to the extent possible.

4. Controlling Distribution Costs: Niche marketers cannot afford to have the wide-spread distribution channels comprising of distributors and retailers. Selling to customers directly from a company website can reduce costs by eliminating intermedials. They can also use e-commerce portals such as Amazon, Flipcart etc. However ensuring availability of the product is the key here as customers buying on-line are much more likely to be angry and frustrated if they don't receive the product on time after ordering. Inventory build- up cannot be permitted and at the same time ensuring timely deliveries in essential through innovative strategies such as exchanging inventory among outlets.

5. Fine tuning Promotions: Traditional advertising campaigns don't make sense for most niche markets; they're too expensive and too difficult to target precisely enough. Instead

These marketers need to work with consumer generated content. For example Word of Mouth campaigns relying more on conversation among

consumers, sponsorships or give-aways at events or establishments frequented by the niche market, endorsement campaigns depending on a few key influencers in the niche market and enlisting them as spokespersons on behalf of the product or service and using them through social media i.e. buzz marketing.

Tale of a Successful Niche Marketer - Wow! Momo Foods Pvt. Ltd., Kolkata

The Market: The growth of QSR s or Quick Service Restaurant industry has been phenomenal in India in the last two decades. The total restaurant sector was worth Rs. 43,000 crores in 2011. The unorganized eating out market had an estimated value Rs. 34400 crores, the sector consisting of street food or fast food stalls spread across the length and breadth of the country with a growth rate of 5-6%. The organized eating out market was worth Rs.8600 crores but growing at 20% out of which Rs. 3000 crores was the share of QSRs. The value of the market had risen to Rs.8500 crores in October 2015 and the growth rate was 25% .This is projected to grow to Rs. 25000 crores by 2020 as per an analysis made by ASSOCHAM in October 2015.

The Niche: The organized QSR segment was dominated by a few players such as Dominos, Pizza Hut, Burger King, Narulas, KFC, Café Coffee Day, Haldiram's etc. These QSR S offered consumers choices of particular food and beverages which guaranteed quality and hygiene that could be delivered fresh and fast. However none of them offered Momos, the Tibetan style dumplings with fillings of chicken, pork, vegetables or cheese. Momos were offered almost exclusively in the unorganized sector sold by street side vendors in the tier one and two cities. There was no quality or hygiene promise by these vendors.

The Firm: Two graduate students of St. Xavier's College, Kolkata, Sagar Daryani and Binod Homagai had detected this niche that existed in the QSR Sector – branded Momos.

They decided in 2008 to enter this niche and formed **Wow! Momo Foods Pvt. Ltd.** opening one solitary outlet in Spencers at South City Mall, Kolkata. They made an initial investment of Rs.30,000.

The Product: The product varieties were minimized but quality standardization was strictly maintained. There were eleven varieties of Momo offered in Chicken, Vegetable, Fish, Mushroom, Paneer, Corn Spring Onion & Prawn These were served over the counter or home deliverd in paper carton boxes of a distinctive yellow colour adorned with the company logo. Some of the outlets had dine-in facilities as well.

Company Logo and serving carton of Wow! Momo

Strategy: Traditional Marketing campaigns were avoided. Instead they relied on word of mouth advertising made by satisfied customers on social media platforms. Print advertising was limited to distributing **Wow! Momo** leaflets detailing the varieties of product offerings along with Newspapers in different locations in Kolkata.

Production costs were kept in check by standardizing of ingredients and the price was fixed to attract the quality conscious urban middle and upper-middle class at Rs 85 to Rs.120 for a box of six pieces of momo - Steamed , Fried or Pan-fried.

The Success: In a short span of eight years **Wow! Momo** has been able to sat establish itself in this Niche i.e. Branded Momos firmly. The

turnover in was 2014-15 was Rs.20 crores and is expected to reach Rs.40 crores in 2015-016. They now operate 64 outlets in seven cities across India and sell 150000 momos per day and are planning to open 100 outlets by 2017. **Wow! Momo** has been operating at a gross margin of 48% to 55% in a market growing at 25%.They have now increased their product offering and included Momo sizzlers, Momo burgers and Thukpa in their menu. In August 2015 **Wow! Momo** have been able to acquirer Rs. 10 crore investments from Indian Angel Network and the company has been valued at Rs. 100 crores.

Sagar Daryani, co-founder of **Wow! Momo** has described the **Wow!Momo** mission as " To make the products the food for all occasions and create a niche market not only for the masses but also for the upper and middle classes." However **Wow! Momo** would be wise to not think of mass marketing and diluting their brand position with the risk of losing their Niche altogether.

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Girijanullo Konda Redlu-Jeevana Vidhanam

(గిరిజనుల్లో కొండరెడ్లు - జీవన విధానం)

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1. ఉపోద్ఘాతం :

భారతదేశంలో చాలాకాలం నుండి గిరిజనులు సమాజానికి దూరంగా జీవనం చేస్తున్నారు. ముఖ్యంగా నాగరికమైన ప్రజానీకానికి అందుబాటులో లేకుండా కొండల్లో, కోనల్లో, సుదూరమైన ప్రాంతాల్లో జీవనం గడుపుతూ వస్తున్నారు. వీరు ఆర్థికంగా, రాజకీయంగా, సామాజికంగా చాలా వెనుకబడి జీవిస్తున్నారు. వీరిది ఆటవికమైన జీవనమే అని చెప్పవచ్చు. ముఖ్యంగా గిరిజనులు జీవిస్తున్నా ప్రాంతాల్లోకి యితరులుగాని, అదివాసిపాలనను విచ్ఛిన్నం చేసే ప్రయత్నాల వర్గాలుగాని చొచ్చుకొని వచ్చినప్పుడు ఎదురు తిరిగిన సంఘటనలు, చాలా తిరుగుబాట్లు జరగడంవల్ల, పాలకుల నుండి అప్పటినుండి యిప్పటి వరకు, యికముందు కాలంలో కూడా రాయితీలు పొందుతూనే, వాటి ద్వారా అదివాసులు తమ ఉనికిని కోల్పోతున్నారనే భావం బలోపేతంగా విశదమవుతుంది. అయినప్పటికీ అదివాసులు తమ ఉనికిని, ఉన్నతిని యిప్పటికీ కాపాడుకుంటూ వస్తున్నారు. యిటువంటి గిరిజనుల్లో ఒక తెగ కొండరెడ్లు.

తూర్పు కనుమలు, దండకారణ్య ప్రాంతం వీరికి నెలవు. ఈ తెగవారు ఖమ్మం, తూర్పుగోదావరి, పశ్చిమగోదావరి జిల్లాల్లో అధికంగా, యితర జిల్లాల్లో చెప్పుకోదగిన సంఖ్యలోవున్నారు. అదిమ గిరిజనుల్లో తమది ప్రముఖస్థానమని, పాండవుల వంశానికి చెందిన తాము తరువాత పాండవరెడ్డి వంశావళిగా మారినట్లు చెప్పుకుంటున్నారు. కాగా తూ.గో.జిల్లా రాజమహేంద్రవరం కేంద్రంగా పరిపాలించిన అప్పటి రాజులను ఎదిరించి, గోదావరి నది పాపికొండల్లో స్థిరనివాసాలు ఏర్పాటు చేసుకున్నట్టు చరిత్రకారులు పేర్కొన్నారు. కొండలలో నివసించే రెడ్లు కాబట్టి "కొండరెడ్లు" అని ప్రసిద్ధమయ్యారు.

2. కొండరెడ్లు - నివాసాలు :

కొండలలో చిన్న చిన్న ఆవాసాలు ఏర్పాటు చేసుకొని, విశాలమైన తడికలు, బోధ గడ్డితో ఇళ్లు నిర్మించుకుంటారు. తడికలకు మట్టి పూసి గోడలుగా ఏర్పాటు చేసుకుంటారు. కొండలలో లభించే బోధ గడ్డిగాని, తాటి ఆకులను గాని పైకప్పు తయారీకి వాడతారు. ఇళ్లు నాలుగు వాసాలతో ఎత్తయిన గోపురం ఆకారంలో వుంటుంది. ప్రతి ఇంటికీ ప్రధానంగా వంటగదితోపాటు పడకగది

ఏర్పాటు చేసుకుంటారు. ఇంటికి ప్రత్యేకంగా తలుపులు, కిటికీలు వుండవు. ఇంటిముందు, వెనుక కూరగాయలు పెంచేందుకు వీలుగా కొంత స్థలం వదులుకుంటారు.

3. ఆచార వ్యవహారాలు :

వీరి వస్త్రధారణ భిన్నంగా వుంటుంది. పురుషులు గోచి ధరించి మచ్చు కత్తిని ఎల్లప్పుడు తమ వెంట వుంచుకుంటారు. అడువులలో సంచరించేటప్పుడు అది వారి రక్షణకు వినియోగించుకుంటారు.వీరి మాతృ బాష తెలుగు. స్వచ్ఛమైన తెలుగును కొంత యాసతో మాట్లాడుతారు. బాల్యవివాహాలు వీరి ఆచారం. పితృ స్వామ్య కుటుంభీకులైన వీరిలో ఏక పత్నీవ్రతం నిబంధన వున్నప్పటికీ బాహుభార్యత్వం కూడా కనిపిస్తుంది. ప్రేమ, సేవ, వినిమయం, సంప్రదింపులు, సహపలాయనం, పర గ్రహణం పద్ధతుల ద్వారా జీవితభాగస్వామిని పొందటం సాంఘిక ఆచారంగా వుంది. చనిపోయిన సోదరుని భార్యను వివాహం చేసుకోవడం ఆచారం. కుటుంబనియంత్రణ అస్సలు పాటించరు. మహిళలను తీసుకువెళ్లడం, ఆపహరణ, వివాహానికి ముందే సంబంధాలు, వివాహానంతర అక్రమ సంబంధాలు, విడాకులు, భూదగాదాలు మొ।। వాటి విచారణను పంచాయితీ వ్యవస్థ నిర్వహిస్తుంది. వావివరసలు పాటించని శారీరక సంబంధాలను, వ్యభిచారాన్ని తీవ్రంగా పరిగణిస్తారు. అలాంటి వాటాకి పాల్పడిన వారిని సమాజం నండి బహిష్కరిస్తారు. తప్పు తెలుసుకున్న నేరస్తులు ప్రాయశ్చిత్తం పొంది, తిరిగి ప్రధాన జనజీవన స్రవంతిలో చేరే వెసులుబాటు వుంటుంది. అలాంటి సందర్భాల్లో తమ తెగవారికి పెద్ద ఎత్తున విందు యిస్తారు. ఆచార వ్యవహారాలు పాటించటంలో ఎక్కడ రాజీపడరు. గర్భిణీలను గ్రామం చివరగా ప్రత్యేకంగా ఏర్పాటుచేసిన 'కీడుపాక' లో వుంచుతారు. గర్భం ధరించిన 3-6 నెలల మధ్య ఆమెను అక్కడికి చేరుస్తారు. అక్కడకు చేరిన ఆ గర్భిణీ యితరులకు ముఖం చూపించకుండా, ప్రసవించేంత వరకు అక్కడే వుండవలసివుంటుంది. కులసంప్రదాయం ప్రకారమే కాన్పులు జరుగుతాయి. అసుపత్రులను ఆశ్రయించరు. సంప్రదాయానికి స్వస్తి చెప్పాకపోవటం ఒక కారణమైతే, కొండకోనలు వీడలేకపోవటం వల్ల అసుపత్రులు అందుబాటులో లేవని పరిశీలకులు అంటున్నారు.

4. జీవన విధానం :

పక్షులు, జంతువులను వేటాడి ఆహారం సమకూర్చుకుంటారు. ఎండుచేపలు వీరికి ప్రీతిపాత్రమైన ఆహారం. చిన్న చెరువుల చేపలంటే మరింతగా యిష్టపడతారు. పలురకాల దుంపలు, వేళ్ళు, ఆకులు, కాయలు తింటారు. ఉదయం నుండి సాయంత్రం వరకు సేకరించిన ఆహారాన్ని సూర్యాస్తమయానికి ముందుగానే భుజించి సేదదీర్చుకుంటారు. సాధారణంగా సూర్యాస్తమయం తరువాత ఎటువంటి ఆహారం భుజించరు. వేట, పోడు, వ్యవసాయంతోపాటు వివిధ రకాలైన ఆటవీ ఉత్పత్తులను సేకరించి, వారాంతపు సంతల్లో విక్రయించి, నిత్యావసర వస్తువుల కొనుగోలు

చేస్తారు. మిగిలిన సొమ్ములో కుటుంబసమేతంగా మద్యం సేవిస్తారు. అడ్డాకులు, జిగురు, తేనే, ముష్టిగింజలు, కరక్కాయలు, చీపుర్లు, వనమూలికలు, ప్రధానంగా సేకరిస్తారు. వెదురు వస్తువుల తయారీలో అందె వేసిన చెయ్యి. అయా కాలాల్లో ఉత్పత్తి అయ్యే మామాడి చింతపండు, గోంగూర, చిక్కుళ్ల వినియోగానికి ముందు పండుగ చేసుకుంటారు. కుల దేవతలకు పూజలు జరిపిన తరువాత వాటిని వినియోగిస్తారు. కొండ కోనల్లో ప్రవహించే సహజనీటి వనరులనే తాగునీటికి ఆశ్రయిస్తారు. నీటితో సహా అన్ని విలువైన వస్తువులను ఎండబెట్టిన సొరకాయ బుర్రలో భద్రపరచుకోవటం వీరి ప్రత్యేకత. కుల పెద్దను 'పెదకాపు'గా వ్యవహరిస్తారు. ప్రతిగ్రామానికి ఈ పదవి వారసత్వంగా సంక్రమిస్తుంది. ఆయన తమ్ముడు లేదా సమీప బంధువు సహాయకులుగా వ్యవహరిస్తారు. వారినే చినకాపు లేక చిన పెద్ద అని వ్యవహరిస్తారు. కుల పెద్ద తీర్పు వీరికి శిరోధార్యం.

5. భక్తి విధానం :

ముత్యాలమ్మను వీరు గ్రామ దేవతగా పూజిస్తారు.భూదేవి, గంగమ్మ, గుబ్బల మంగమ్మ, సారాలమ్మ, సింగారమ్మ, దేవితమ్మ, నూకాలమ్మ వంటి దేవతలతో పాటు పంచపాండవులను కొలుస్తారు. అతీతమైన శక్తులపై నమ్మకం ఎక్కువ. చనిపోయిన వారి ఆత్మలు సంచరిస్తాయని వీరి విశ్వాసం. భూదేవమ్మ పండుగ, మామిడి కోత పండుగ, కొర్రకోతల పండుగ, తదితర కోతల పండుగలు, పచ్చల పండుగలు, బండికొలుపు, వానదేవుడు పండుగల వంటివి జరుపుకుంటారు. వేట సమయంలో ఎటువంటి ప్రమాదాలు సంభవించరాదని కోరుకుంటారు. కొండరాజుల పండుగ జరుపుకుంటారు. వ్యవసాయ పనుల ప్రారంభానికి ముందు,పంటచేతికి వచ్చిన తరువాత తినేముందు కూడా కొండరెడ్లు పండుగ చేసుకోవటం అనవాయితీ.

గిరిజనులంతా ఒక చోట చేరి భూమిపూజ నిర్వహించి గ్రామదేవతకు పూజలు చేసి, సంప్రదాయ బద్ధంగా వ్యవసాయపనులు ప్రారంభిస్తారు. ఈ పండుగ జరుపుకునే రోజును గ్రామపెద్ద గ్రామస్తులు సమక్షంలో ఖరారు చేస్తారు. ఆయా గ్రామాలకు చెందినవారు ఎక్కడున్నా భూమిపూజనాటికి విధిగా స్వగ్రామాలకు చేరవలసి వుంటుంది. భూమిపూజ తరువాత పురుషులు రెండు వారాలపాటు వేటకు వెళతారు. వేటలో ఏదైనా అడవిజంతువు దొరికితే, ఆ ఏడాది మంచి వానలు కరుసి పంటలు బాగా పండుతాయని వారి విశ్వాసం. పండుగలు,

శుభకార్యాల సందర్భంగా స్త్రీ పురుషులు ఎద్దుకొమ్ము నృత్యం చేస్తారు. ఎద్దుకొమ్ముతో చేసిన శిరస్త్రాణాన్ని ఒక పురుషుడు ధరించగా, ఒక రిద్దరు పెద్ద ధంకాలను మోగ్రిస్తారు. మిగిలిన స్త్రీ పురుషులు లయబద్ధంగా నృత్యం చేస్తారు. పంట చేతికి వచ్చిన తరువాత మొదట గ్రామ దేవతకు నైవేద్యం పెట్టడాన్ని, 'కొత్తల పండుగ' అంటారు. అలా నైవేద్యం పెట్టిన తరువాతనే మిగిలిన పంట కోతలు చేపడతారు. పెదకాపు పూజారిగా వ్యవహరిస్తాడు.

ముగింపు :

అధునిక ప్రంచానికి దూరంగా జీవనం సాగిస్తున్న వీరికి ప్రధాన జనజీవన స్రవంతిలో చేర్చి, వారికి మౌలిక వసతులు కల్పించేందుకు సమీకృత గిరిజనాభివృద్ధి సంస్థ (ITDA) కృషి చేస్తుంది. దీని కృషితో గిరిజనులు ముందుకు దూసుకెళ్ళటం శుభసూచకం.

ఉపయుక్త గ్రంధాలు :

1. డా॥ పి. వెంకట్రావు – "ఆంధ్రప్రదేశ్ గిరిజన సమస్యలు – సంక్షేమం"
2. ఆర్. రామకృష్ణయ్య – "గిరిజనులు అభివృద్ధిలోని నూతన అభ్యాసాలు"

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THE ROLE OF COMPUTERS IN ENGLISH LANGUAGE TEACHING

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Abstract:

Today Computer is a very good tool in teaching English language. It provides us vast range of opportunities to associate with English language at any time. A computer can assist an English teacher in the area of facilitating good number of exercises to listen and read English. We can also use the serves of computers in testing the skills of students in the class room as a teacher. A student can be updated in vocabulary through the association with internet and online information. We can get world class lectures and seminars through this computer. A man can do mistakes but a machine never thus we would have accuracy in teaching and testing language skills of large number of students at a time. There are some programs in computers which do offer learning tasks as games these programs provide great enthusiasm in the minds of young learners. We must confess that no one can provide us such material which we can get from internet today .finally we can conclude this by saying computer is a unique facilitator in teaching English language.

Introduction

Teaching students to be literate is a high educational priority throughout the world. Though this area is one of our greatest priorities, it is also one of our greatest challenges. As days passing on the class environment have been changing so teachers have to prepare to face the require-ments of the class room .For this we must have a tool which supports to reach the current needs that is nothing but computer. It is

accepted computers have made a triumphal entry into educa-tion in the past decade, and only a dyed-in-the wool Luddite would deny that they have brought significant benefits'to teachers and students alike. However, an uncritical use of computers can be just as disadvantageous to students as a refusal to have anything to do with them. In this article I discuss some of the ways that computers can be used in English language teaching, with a view to helping colleagues make the most of the opportunities they offer to ESL students.

It is helpful to think of the computer as having the following main roles in the language classroom:

• Teacher - the computer teaches students new language

• Tester - the computer tests students on language already learned

• Tool - the computer assists students to do certain tasks

• Data source - the computer provides students with the information they need to perform a particular task

Communication facilitator - the computer allows students to communicate with others in different locations

Computer as teacher

In the early days of computers and programmed learning, some students sat at a terminal for extended periods following an individualized learning program. Although we have come a long way from the rather naive thought, held by some at that time, that the computer could eventually come to replace the teacher, there has been a return to a much more sophisticated kind of corn-puterized teaching using multimedia CD ROMS. In such programs, of the computer screen, usually attached to a microphone headset. For this reason alone I prefer not to use them in my language teaching. Another of their serious drawbacks, in my view, is the fact that in many cases the course

content and sequence is fixed. The teacher has no chance to include materials that are of interest and importance to the particular students in his or her class.

As an alternative to large CD ROM packages, there are an increasing number of useful sites on the World Wide Web, where students can get instruction and practice in language skills such as reading, listening and writing.

Computer as a tester

The computer is very good at what is known as drill and practice; it will tirelessly present the learner with questions and announce if the answer is right or wrong. In its primitive manifestations in this particular role in language teaching, it has been rightly criticized. The main reason for the criticism is simple: many early drill and practice programs were much unsophisticated; either multiple-choice or demanding a single word answers. They were not programmed to accept varying input and the only feedback they gave was Right or Wrong. So for example, if the computer expected the answer "does not" and the student typed "doesn't" or "does not" or "does not", she would have been told she was wrong without any further comment. It is not surprising that such programs gave computers a bad name with many language teachers. Unfortunately, there are now very many of these primitive drill and kill programs flooding the Internet.

Despite their obvious disadvantages, such programs are nevertheless popular with many students. This is probably because the student is in full control; the computer is extremely patient and gives private, unthreatening feedback. Most programs also keep the score and have cute animations and sounds, which many students like.

There are some programs which do offer more useful feedback than right or wrong, or that can accept varying input. Such programs blur the role of the computer as teacher or tester and can be

recommended to students who enjoy learning grammar or vocabulary in this way. If two or more students sit at the same computer, then they can generate a fair amount of authentic communication while discussing the answers together.

Computer is a tool

It is in this area that I think the computer has been an unequivocal success in language teaching. Spreadsheets, databases, presentation slide generators, concordances and web page producers all have their place in the language classroom, particularly in one where the main curricular focus is task-based or project-work. But in my opinion, by far the most important role of the computer in the language classroom is its use as a writing tool: It has played a significant part in the introduction of the writing process, by allowing students easily to produce multiple drafts of the same piece of work.. Students with messy handwriting can now do a piece of work to be proud of, and those with poor spelling skills can, after sufficient training in using the spell check, produce a piece of writing largely free of spelling mistakes.

Computer as a data source

We need not to say much about the Internet as a provider of information. Anyone who has done a search on the World Wide Web will know that there is already more information out there than an individual could process in hundred lifetimes, and the amount is growing by the second. This huge source of information is an indispensable resource for much project work, but there are serious negative implications. I shudder to think of how much time has been wasted and will continue to be wasted by students who aimlessly wander the Web with no particular aim in mind and with little or no guidance. I generally do not turn my students free to search the web for information. Instead, I find a few useful sites beforehand and tell the

students to start there; anyone who finishes the task in hand can then be let loose!

As an alternative to the Web, there are very many CD ROMs, e.g. encyclopedias, that present information in a more compact, reliable and easily accessible form.

Computer as communication facilitator

The Internet is the principal medium by which students can communicate with others at a distance, (e.g. by e-mail or by participating in discussion forums). In fact at Frankfurt International School the single most popular use of computers by students in their free time is to write e-mails to their friends. Some teachers have set up joint projects with a school in another location and others encourage students to take part in discussion groups. There is no doubt that such activities are motivating for students and allow them to participate in many authentic language tasks. However, cautious teachers may wish to closely supervise their students' messages. Recent re-search has shown up the extremely primitive quality of much of the language used in electronic exchanges!

Computers in education have been disparaged as: Answers in search of a problem. And certainly many computer activities of dubious pedagogical value have been devised in the past simply to justify the existence of an expensive computer in the classroom. Nowadays, however, I think it is much more clearly, for the students, most enjoyable way to get the job done.

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(అచ్చ తెలుగురామాయణంలో అచ్చ తెలుగు)

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తెలుగు సాహిత్య చరిత్రను పరిశీలిస్తే క్రీ:శ. 16వ శతాబ్దం వరకు మహాకవుల పేరుమీదనో, రాజవంశాల పేరు మీదనో చేసినవిభజన కనిపిస్తుంది. కాని హఠాత్తుగా పై పద్ధతి నుండి వైదొలగి 17, 18, 19 శతాబ్దాల దగ్గరకు వచ్చేటప్పుటికి దానిని రాయలయుగం (స్వర్ణం) దక్షినాంధ్రయుగం, ఆంధ యుగం క్షీణ యుగం సంది యుగం ఆధునిక యుగం మొదలగు పేర్లతో పిలుస్తారు.

తెలుగు సాహిత్యంలో తొలికవి సార్వభౌముడు శ్రీనాథుడు అయితే అనేక గ్రంథాలు వ్రాసి, అతని తరువాత కవి సార్వభౌమ బిరుదు పహించిన కూచిమంచి తిమ్మకవి జీవించిన 18వ శతాబ్దమును క్షీణయుగం అని పేర్కొనుట తెలుగు సాహిత్యానికి అన్యాయం చేయటమేనని దక్షిణ దేశీయాంధ్ర వాఙ్మయంలో నిదుదహోలు వేంకట్రావ్ గారు పస్తావించారు.

కూచిమంచి తిమ్మకవి కాకినాడకు సమీపంలోఉన్న కందరాడ అనే గ్రామంలో నివసించేవాడు. ఆనాటి పరిస్థితులలో పాశ్చాత్యులు భారత అంతరంగిక వ్యవహారాల్లో తలదూర్చుతూ స్థానిక రాజకీయ వ్యవస్థను బలహీనపరుస్తూ అస్థిరత్వానికి దారితీస్తున్నా సందర్భమది.

కందరాడ గ్రామంకూడా పాశ్చాత్యుల సేనవ ప్రయాన మార్గమధ్యంలో ఉండడంచేత పరిసర ప్రాంతాల ప్రజలు చాలామంది పిఠాపురం సమస్థానానికి వలసగా వెళ్ళిరి. బహుశ తిమ్మకవికూడా ఆ విధంగానే పిఠాపురం చేరి తన సాహితీ ప్రస్థానాన్ని కొనసాగించాడు.

రుక్మిణి పరిణయం రాజశేఖర విలాసం కృష్ణదండకం, చిరవిభవ శతక, సింహచల మహాత్మ్యం, నీలా సుందరి పరిణం అచ్చ తెలుగు రామాయణం, సారంగధర చరిత్ర, భర్గశతకం, సాగరసంగ మహత్మ్యం, లక్షణసార సంగ్రహం రసిక జనమనోభిరామం సర్పపుర మహత్మ్యం కుక్కుటేశ్వర శతకం భల్లాణ చరిత్ర, శివలీల విలాసము వంటి గ్రంథాలు వ్రాసి ఆంధ్ర కవితా సరస్వతికి తన కవితా ప్రభావముచేత అనేక విధముల సేవచేసి తెలుగు సాహిత్య చరిత్రలో ఒక ప్రత్యేక స్థానమును సంపాధించుటయే కాక పిఠాపుర పాలకుడు అయిన రావు నీలాద్రి మాదవరావుచే కవిసార్వభౌమ బిరుదు అందుకున్నాడు.

తిమ్మకవి సంస్కృతాంధ్ర భాషలలో సమానమైన పాండిత్యము కలవాడు. సంస్కృత భూయిష్ట పదములతో ఎంత చక్కగా సమాస ఘటన చేయగలడో అచ్చ తెలుగు శబ్దములతో కూడా అంతే నిరాఘాటంగాను స్పష్టంగాను కవిత్వం వ్రాయగల సమర్థుడు. ఇతనికంటే ముందు సాహిత్యంలో ప్రక్రియా వైవిధ్యం ఎంతగానో కనిపిస్తుంది. వచనకావ్యాలు ద్వ్యర్థి త్యర్థి కావ్యాలు , శతకాలు యక్షగానాలు, దండకాలు, శృంగార ప్రబంధాలు వచ్చాయి. కూచిమంచి తిమ్మకవిలో కూడా ఈ ప్రక్రియ బాహుళ్యాన్ని చూడవచ్చు.ఈ కాలంలో ప్రక్రియా వైవిధ్యంతోపాటు, రచన వాడుక భాషకు దగ్గరగా రావడం కనిపిస్తుంది. ప్రక్రియా వైవిధ్యం అపారంగా ఉండడానికి కారణాలు పరిశీలిస్తే, సలక్షణమైన మహాకావ్య రచన ప్రాచీనుల మార్గంలో చేయడానికి తగిన వాతావరణం లోపించడంవల్ల నూతనత్వ ప్రకటనకోసం అన్వేషణ ప్రారంభించడం ఒక ప్రధాన

కారణంగా కనిపిస్తుంది. అందుకే పూర్వులు చేయని పనులు వెతుక్కున్నారు. ఈ ప్రయోగం వైచిత్ర కుతూహలమే, నూత్న ప్రియత్వమే అచ్చ తెలుగు కావ్యాలు ప్రభవించడానికి కారణం అయ్యింది.

ఆంధ్ర సాహిత్యంలో పొన్నగంటి తెలగన తర్వాత అచ్చ తెలుగులో కావ్యాలు రాసింది కూచిమంచివారే. నీలా సుందరి పరిణయం, అచ్చ తెలుగు రామాయణం ఈ రెండు తిమ్మకవి కీర్తి సాధమున కెత్తిన ఉన్నత పతాకలు. తత్సమాలు, గ్రామ్యాలు తప్ప మిగిలిన పదజాలమంతా అచ్చ తెలుగుగా లాక్షణికులు గుర్తించారు. ఇంకా తేట తెలుగు, నాటు తెలుగు అని కూడా నిర్వచించారు. నన్నెచోడుని జాను తెనుగు, పాల్కుర్కిసోమన దేశి తెనుగు సంస్కృతాంధ్ర సమిశ్రితమై తత్సమ, దేశ్య పదములతో కూడి ఉన్నవి.ఇతని రచనలలో మనకు ఛందోవైవిధ్యము కనిపిస్తుంది. దేశిచ్ఛందస్సు, సంస్కృత వృత్తాలేగాక విశేష వృత్తములను ఆదరించి అచ్చ తెలుగుకు అందాన్ని తీసుకువచ్చాడు. ఉత్సాహ, మత్తకోకిల, పంచచామరము, భుజంగా ప్రయాతము, తోటకము, కమల విలసితము, సగ్విణి మొ: కాక గొప్ప ధారశుద్ధితో ఒక దండకమును, యుద్ధకాండలో రచించినాడు. భక్తి భావం నుండి దండకాల పలెకాక యుద్ధ వాతారపణము స్ఫురింపజేయును.

"అరిది బిరుదా నీవు రాయంచ తేజీపజీరుండవై చుట్టూ వాల్దాల్పవై మెట్టువిల్లేల్పపై లీవితో ముజ్జగం బెల్ల బుట్టించుచుం బ్రోచుచుం ద్రుంచుచున్ నీవెజ్‌బిల్లివై ప్రొద్దవై ... (యుద్ధకాండ-161).

ఈ విధంగా తిమ్మకవి అచ్చ తెలుగు రామాయణంలో దండకాన్ని రాశారు.

యయాతి చరిత్రలో పొన్నగంటి తెలగన కావ్యంలోని పేర్లు బిరుదులను సంస్కృతంలోనే ఉంచుట మంచిదనియు, వానిని మార్చి కృతక పదబంధాలను కల్పించినచో ఇంపుగా, ఉండదని చెప్పాడు. కూచిమంచి వారు ఈ నియమాన్నే పాటిస్తానన్నప్పటికి కొన్ని పేరులు, బిరుదులు అచ్చ తెలుగు చేయకమానలేదు.

అచ్చ తెలుగు పదాల వైచిత్రి

బాలకాండము:

మరునయ్య-మన్మధుని తండ్రియగు విష్ణువు.
చల్వడాల్దార-చల్లని మంచులో నుండు ప్రభువు (హిమవంతుడు)
రాచవేల్పుదొర -దేవతల రాజు-ఇంద్రుడు
పెందపసి-పెద్ద తపస్సు చేసినవాడు -విశ్వామిత్రుడు
గండ్రగొడ్డలి దాల్పు-గండ్రగొడ్డలిని ధరించివాడు- పరుశురాముడు
పుడమి కాన్పు మగడు-భూదేవి బిడ్డ అయిన సీత మగడు
బంతి తేరుల దొర-దశరథుడు
పుట్టబుట్టువు-పుట్టలో బుట్టినవాడు-వాల్మీకి

అయోధ్య కాండ:

కత్తెరగంటి తపసి-నారదుడు
తూర్పు దుబ్బరి -తూర్పు కొండలు
నేలకాన్పు గొమ్మ-భూదేవి బిడ్డ -సీత
జేజే ప్రోలు -దేవతల ఊరు -స్వర్గము

అరణ్య కాండ:

సిరుల చెలిమగడు-లక్ష్మీదేవి భర్త-విష్ణువు
వేల్పుజడదారి-నారదుడు
సుప్పనక-శూర్పణఖ
జక్కిదొ-యక్షుల ప్రభువు-కుబేరుడు
పులుగు వంగడపు దొర-పక్షి సంతతికి రాజు-గరుత్మంతుడు

కిష్కింధకాండ:

చీకటుల గొంగకొడుకు –సూర్యుని కుమారులు–సుగ్రీవుడు

బంతితేరుల తోడు– పంక్తి రథముల రాజు–దశరథుడు

సుందరకాండ:

నల్లద్రావుడు దొ–రావణాసురుడు

గాలిబుడత–వాయునందనుడు –ఆంజనేయుడు

చేటగోళ్ళమోటి – సుప్పనాతి–శూర్పణఖ

యుద్ధకాండ:

తేరుల దొరబిడ్డ –దశరథుని కొడుకు–రాముడు

బొఱియకానుపు–వాల్మీకి

కయ్యపుదిండి జడదారి–నారదుడు

గాడుపు చూలి –ఆంజనేయుడు

చూచుల సామి –శంకరుడు

ఇలా లోక వ్యవహారములో ఉన్న పదములకు తద్భవ రూపములు కూడా వాడబడినవి. కవి ప్రతి పేరుకు అనేక విధాల అచ్చ తెలుగు పదాలు కల్పించెను. అలాగే జాతీయాలు అనేకం కనిపిస్తాయి.

జాతీయాలు:

–వంకయును, మచ్చయును: అయోధ్యనగరంలో నాట్యకత్తెలైన వేశ్యలున్నారు. వారు పరాక్రమము కలిగిన వీటులను అభిమానిస్తారు. కాని స్వల్పమైన లోపము, కళంకం ఉన్నవారిని నిందిస్తారు.

–ముప్పొద్దు మువ్వీసములు: ప్రాత కాలము, మధ్యాహ్నము, సాయం కాలము, మూడు వేళల్లో విజృంభించేవాడు.

–ఉప్పిడులు: ప్రతాలు, ఉపవాసాలు.

–పడరాని పాట్లు: అనుభవించరాని కష్టాలు. ఈ జాతీయాలన్ని ప్రాంతభేదాలు లేకుండా ఆంధ్రదేశంలో వాడుకలో ఉన్నవే.

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RINGS IN WHICH EACHMODULE IS A MISSINGZIP-DIVISOR

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Abstract:

We introduce the concepts of left (right) zip-divisor rings, a class of rings with-out identity. We call a ring Rleft (right) zip-divisor if $r_R(a) \neq 0$ $(l_R(a) \neq 0)$ for every $a \epsilon R$,, and call Rstrong left (right) zip-divisor if$r_R(R) \neq 0$ $(l_R(R) \neq 0)$. Camilla and Nielson called a ring right finite annihilated(RFA) if every finite subset has non-zero right annihilator. We present in this paper some basic examples of left zero-divisor rings, and investigate the extensions of strong left zero-divisor rings andRFA rings, giving their correspondingclassification

Keywords : zip-divisor; absentzip-divisor ring; strong absentzip-divisor ring; RFA ring; extension of rings.

1. Some examples of absentzip-divisor rings

Throughout this paper rings are general associative rings (with or without identity),$\mathbb{Z}$denotes the ring of integers and $\mathbb{N}$ denotes the set of positive integers. Given a ring R, the right (left) annihilator of a subset $X$of $R$is defined by $r_R(X) = \{a \epsilon R | X_a = 0\}$ $(l_R(X) = \{a \epsilon R | aX = 0\})$, the polynomial ring over Rin one indeterminate $x$is denoted by $R[x]$.

Definition 1.1*A ring R is called left (right) zero-divisor if* $r_R(a) \neq 0$ $(l_R(a) \neq 0)$*for every* $a \epsilon R$*, and a ring* R *is called zero-divisor if it is both left and right zero-divisor.*

Obviously, any non-zero nil ring is zero-divisor; and rings with identity are never left (right) zero-divisor. If $R$is reversible (a ring $R$is called *reversible* if $ab = 0$ implies $ba = 0$ for$a, b\epsilon R$.), then $R$is left zero-divisor if and only ifs $R$is right zero-divisor. In general, a left (right) zero-divisor ring need not be a nil ring and the zero-divisor property for a ring is not left-right symmetric.

Proposition 1.2 *If one of* $\{R_i\}_{i\epsilon W}$*is left zero-divisor, so is* $R = \oplus_{i\epsilon W} R_i$ $(R = \Pi_{i\epsilon W} R_i)$.

Note that $R = \oplus_{i\epsilon W} R_i (R = \Pi_{i\epsilon W} R_i)$is left zero-divisor does not imply that every$R_i (i\epsilon W)$ is left zero-divisor.

For any ring R, we define $QM_2(R) = \left\{\begin{pmatrix} a & b \\ c & d \end{pmatrix} \mid a + b = c + d, a, b, c, d\epsilon R\right\}$, then $QM_2(R)$ is a subring of $M_2(R)$. Moreover, given an (R, R)bi -module M, the trivial extension of $R$by M(see [4]) is the ring $T(R, M) = R \oplus M$with the usual addition and the followingmultiplication:

$$(r_1, m_1)(r_2, m_2) = (r_1 r_2, r_1 m_2 + m_1 r_2).$$

This is isomorphic to the ring of all matrices$\begin{pmatrix} r & m \\ 0 & r \end{pmatrix}$, where $r\epsilon R$and $m\epsilon M$and the usual matrix operations are used.

Theorem 1.3 *The following statements are equivalent for a ring* R*:*

(1) R *is left zero-divisor.*

(2) For any $n\epsilon\mathbb{N}$*, the ring* $T_n(R)$*of* nXn *upper triangular matrices over*R *is left zero-divisor.*

(3) $QM_2(R)$ *is left zero-divisor.*

$$\left\{ \begin{pmatrix} a_0 & a_1 & a_2 & \dots & a_{n-1} \\ 0 & a_0 & a_1 & \dots & a_{n-2} \\ 0 & 0 & a_0 & \dots & a_{n-3} \\ \dots & \dots & \dots & \dots & \end{pmatrix} \mid a_i \epsilon R, i = 0,1, \dots, n-1 \right\}$$

$0 \quad 0 \quad 0 \quad \ldots \quad a_0$

(4) For any $\epsilon\mathbb{N}$, $S_N(R)$ = *is left zero-divisor.*

(5) For any $\epsilon\mathbb{N}$ *;* $R[x]/(x^n)$*is left zero-divisor, where* (x^n) *is the ideal generated by*x^n*.*

(6) $T(R,R)$ *is left zero-divisor.*

Proof (1) ⇒(2). Assume that$R$is left zero-divisor and $A = (a_{ij})\epsilon T_n(R)$, where $a_{ij} = 0$ if $i > j$. Then there exists $0 \neq t_{ii}\epsilon R$such that $a_{ii}t_{ii} = 0$ for any $i, 1 \leq i \leq n$. Taking $D = (d_{ij})$, where$d_{11} = t_{11} \neq 0, d_{ij} = 0, 1 < i, j \leq n$, we get $0 \neq D\epsilon T_n(R)$ such that $AD = 0$. Hence$T_n(R)$ is left zero-divisor.

(2) ⇒(3). We construct a map $f : QM_2(R) \Rightarrow T_2(R), \begin{pmatrix} a & b \\ c & d \end{pmatrix} \nrightarrow$ $\begin{pmatrix} a+b & b \\ 0 & d-b \end{pmatrix}$, for

any $\begin{pmatrix} a & b \\ c & d \end{pmatrix} \epsilon QM_2(R)$. It is easy to verify that$f$is an injective and a ring homomorphism.

For any $\begin{pmatrix} x & 0 \\ 0 & y \end{pmatrix} \epsilon T_2(R)$, since

$$f\left(\begin{pmatrix} x & z \\ x-y-z & y+z \end{pmatrix}\right) = \begin{pmatrix} x & z \\ 0 & y \end{pmatrix}$$

$f$is a ring isomorphism. This completes the proof by (2).

(3)⇒(1). Let $r\epsilon R$. Then $A = \begin{pmatrix} r & 0 \\ 0 & r \end{pmatrix} \epsilon QM_2(R)$. Since $QM_2(R)$ is left zero-divisor, there exists $0 \neq T = \begin{pmatrix} a & b \\ c & d \end{pmatrix} \epsilon QM_2(R)$. such that $AT =$ $\begin{pmatrix} r & 0 \\ 0 & r \end{pmatrix}\begin{pmatrix} a & b \\ c & d \end{pmatrix} = \begin{pmatrix} ra & rb \\ rc & rd \end{pmatrix} = 0$, it follows that $ra = rb = rc = rd = 0$. Notice that $T \neq 0$, there must be $0 \neq s\epsilon R$such that $rs = 0$, as desired.

(1) ⇒(4). Let $A = (a_{ij}) \epsilon S_n(R)$, where $a_{ii} = a_0, 1 \leq i \leq n$. Since $R$is left zero-divisor, there exists $0 \neq t_0 \epsilon R$such the$a_0 t_0 = 0$. Taking $0 \neq T = (t_{ij}) \epsilon s_n(R)$, where $t_{1n} = t_0$and $t_{ij} = 0, 1 < i \leq n, 1 \leq j < n$, we get $AT = 0$. Thus, $S_n(R)$ is left zero-divisor.

(4) ⇒(5). Note that $R[x]/(x^n) \cong s_n(R)$, we obtain the result by (4).

(5) ⇒(6). This is obvious since $T(R, R) \cong R[x]/(x^2)$.

(6) ⇒ (1). Let $a \epsilon R$. Then $A = \begin{pmatrix} a & 0 \\ 0 & a \end{pmatrix} \epsilon T(R, R)$. Since $T(R, R)$ is left zero-

Divisor,there exists $0 \neq T = \begin{pmatrix} t & m \\ 0 & t \end{pmatrix} \epsilon T(R, R)$

such that $AT = \begin{pmatrix} a & 0 \\ 0 & a \end{pmatrix} \begin{pmatrix} t & m \\ 0 & t \end{pmatrix} = \begin{pmatrix} at & am \\ 0 & at \end{pmatrix} = 0$, it follows that $AT = 0$ and $am = 0$ Notice that $T \neq 0$, we have $t \neq 0$ or $m \neq 0$. Consequently in any case there is $0 \neq s \epsilon R$such that $as = 0$, as asserted.

Let $R[x; x^{-1}]$ be the ring of Laurent polynomials in one variable $x$with coefficients in a ring R, i.e.$R[x; x^{-1}]$, consists of all formal sums$\sum_{i=k}^{n} m_i x^{-1}$with obvious addition and multiplication,

where $m_i \epsilon R$and $k, n$are (possible negative) integers.

Proposition 1.4 *Let R be a ring. Then $R[x]$is left zero-divisor if and only if so is $R[x; x^{-1}]$.*

Proof Suppose that $R[x]$ is left zero-divisor. Let $f(x) \epsilon R[x; x^{-1}]$. Then there exists an $n \epsilon N$such that $f_1(x) = f(x) x^n \epsilon R[x]$. Hence there exists $0 \neq g(x) \epsilon R[x]$ such that $f_1(x) g(x) = f(x) g(x) x^n = 0$, it follows that $f(x) g(x) = 0$ and $R[x; x^{-1}]$ is left zero-divisor.

Conversely, assume that $R[x; x^{-1}]$ is left zero-divisor, and let $f(x) \epsilon R[x]$. Then there exists$0 \neq g(x) \epsilon R[x; x^{-1}]$ such that $f(x) g(x) = 0$ since $R[x] \subseteq R[x; x^{-1}]$. As $g(x) = x^{-m} g_1(x)$ forsome $m \epsilon \mathbb{N}$and $00 \neq g(x) \epsilon R[x]$, $f(x) g(x) = x^{-m} f(x) g_1(x) = 0$, we obtain that $f(x) g_1(x) = 0$.

Proposition 1.5 *Let R and S be rings and $V = {}_R V_S$ be an (R,S)-bimodule. If R is left zero-divisor, so is $A = \begin{pmatrix} R & V \\ 0 & S \end{pmatrix}$*

Proof Take any $\begin{pmatrix} r & v \\ 0 & s \end{pmatrix} \epsilon A$. For $r \epsilon R$, there exists $0 \neq t \epsilon R$ such that $rt = 0$ since R is left zero-divisor. Thus, we get $0 \neq \begin{pmatrix} t & 0 \\ 0 & 0 \end{pmatrix} \epsilon A$ such that, $\begin{pmatrix} r & v \\ 0 & s \end{pmatrix}\begin{pmatrix} t & 0 \\ 0 & 0 \end{pmatrix} = 0$ which implies that A is left zero-divisor

Proposition 1.6 *If a ring R is left zero-divisor, so is the rings*

$$V(R) = \left\{ \begin{pmatrix} a & 0 & 0 & 0 & 0 & 0 \\ 0 & b & 0 & 0 & 0 & 0 \\ 0 & 0 & c & e & 0 & 0 \\ 0 & 0 & 0 & 0 & b & f \\ 0 & 0 & 0 & 0 & 0 & c \end{pmatrix} \mid \in a, b, c, d, e, f \epsilon R \, . \right\}$$

Proof Fix $A \epsilon v(R)$. Since R is left zero-divisor, there exists $0 \neq a' \epsilon 2R$ such that $aa' = 0$.

Taking $0 \neq T = (t_{ij}) \epsilon V(R)$, where $t_{12} = a'$ and 0 elsewhere, we obtain that $AT = 0$.

Let R be a commutative ring, M an R-module and σ an endomorphism of R. Recall that the *N agata extension* of R by M and σ (see [4]), denoted by $N(R; M; \sigma)$, is the ring $R \oplus M$

with the usual addition and the multiplications
$(r_1, m_1)(r_2, m_2) = (r_1 r_2, \sigma(r_1)m_2 + m_1 r_2)$, where $r_i \in R$ and $m_i \epsilon M, i = 1, 2$.

Proposition 1.7 *Let R be a commutative left zero-divisor ring. Then the Nagata extension $N(R; R; \sigma)$ of R by R and σ is left zero-divisor.*

Proof For any $(r; m) \in N(R; R; \sigma)$, we have $0 \neq \in R$ such that $\sigma(r)t = 0$ since R is left zero-divisor and $\sigma(R) \subseteq R$. Putting $0 \neq (0; t) \in N(R; R; \sigma)$, we get that $(r, m)(0, t) = (r0, \sigma(r)t + 0m) = (0, 0)$. Therefore $\in N(R; R; \sigma)$ is left zero-divisor.

It is interesting to know if the polynomial ring of a ring share the same property with the ring. If $R[x]$ is left zero-divisor, then R is again left zero-divisor. We raise the following question:

if R is left zero-divisor, is the polynomial ring $R[x]$ necessarily left zero divisor?

We do not know whether R is left zero-divisor when both R/I and I are left zero-divisor

for an ideal I of R. In view of this question, the following proposition may be of some interest.

According to Lombok [5], a ring R is called *symmetric* if $abc = 0 \Leftrightarrow acb = 0$ for all $a, bc \in R$, i.e., if $c \in r_R(a) \Leftrightarrow cb \in r_R(a)$. We call a ring R *left symmetric* if $rst = 0$ implies $srt = 0$ for all $r, s, t \in R$. For example, let $R = 2\mathbb{Z}$. Then $T(R, R) \cong \left\{ \begin{pmatrix} r & s \\ 0 & r \end{pmatrix} \mid r, s \in R \right\}$ is left symmetric.

Note that this definition is equivalent to that of symmetric rings for rings with identity, but in general they are different. For instance, $R = \begin{pmatrix} 0 & \mathbb{Z} \\ 0 & \mathbb{Z} \end{pmatrix}$ is symmetric but not left symmetric.

Proposition 1.8 *Let R be left symmetric and I a non-trivial ideal of R which is a right annihilator in R. If $R = I$ is left zero-divisor, then R is left zero-divisor.*

Proof Since $I$is non-trivial, we assume that $I = r_R(S)$ where $0 \neq S \subseteq R$. For any $a \in R$, there exists $\overline{0} \neq \overline{t} \in R/I$such that$\overline{a}\overline{t} = \overline{0}$, i.e., $at \in I = r_R(S)$ since $R/I$is left zero-divisor. It follows that $Sat = 0$. Consequently $aSt = 0$ since$R$is left symmetric. Note that $t \notin I$, we have $St \neq 0$. This implies that there exists $s_0 \in S$such that $s_0 t \neq 0$ and $a(s_0 t) = 0$. Thus $r_R(a) \neq 0$as required.

It is natural to conjecture that the homomorphism image $R/I$of $R$and eR; eRemay also be left (right) zero-divisor for a left (right) zero-divisor ring $R, I \lhd R$and $e = e^2 \in R$. We have,

however, a negative answer to these situations by the following example.

Example 1.9 The ring $R = \left\{\begin{pmatrix} a & 0 \\ b & 0 \end{pmatrix} \mid a, b \in \mathbb{Z}\right\}$ is left zero-divisor. We have

$I = \begin{pmatrix} 0 & 0 \\ \mathbb{Z} & 0 \end{pmatrix} \lhd R, e = \begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix} = e^2 \in R$and $ReR = R$, but $R/I \cong \begin{pmatrix} \mathbb{Z} & 0 \\ 0 & 0 \end{pmatrix} = eR = eRe$is not left zero-divisor.

From the above example it also follows that the left zero-divisor property of rings is not a radical property in the sense of Amateur and Kurosh.

2. Strong left zero-divisor rings and RFA rings

Observe that for some rings, they not only satisfy $r_R(a) \neq 0$ for any $a \in R$but also have $r_R(R) \neq 0$. In this section, we will focus on these rings.

Definition 2.1*A ring R is called strong left (right) zero-divisor if* $r_R(R) \neq 0 (l_R(R) \neq 0)$.Any strong left (right) zero-divisor ring is left (right) zero-divisor, but the converse does nothold.

Example 2.2 Let $R = \sum_{i=2}^{\infty} \mathbb{Z}_2 x_i$ be a countably infinite dimensional vector space over the field $\mathbb{Z}_2 = \{0,1\}$, with basis $T = \{x_2, x_3, \dots, x_n, \dots\}$. Multiplication of the base vectors is defined as

$$x_i x_j = \begin{cases} 0, & if \ (i,j) \neq 1 \\ x_{ij}, & if (i,j) = 1 \end{cases}$$

where (i,j) is the maximal prime divisor of $i$and j. Thought of as a ring, $R$is the set of all finite sums $\sum a_i x_i$ where $a_i$are elements in the field $\mathbb{Z}_2$ .Addition is defined articulately as $a_i x_i + a_j x_j$just written together, if $i \neq j$; and if $i = j$, then $a_i x_i + a_i' x_i = (a_i + a_i') x_i$.

Multiplication is distributive and defined as above. The ring $R$is then commutative. Moreover, for any $a = a_{i_1} x_{i_1} + a_{i_2} x_{i_2} + \cdots + a_{i_n} x_{i_n} \epsilon R$, we have $a^2 = 0$, and hence R is zero-divisor.

For any$a = x_{i_1} + x_{i_2} + \cdots + x_{i_n} \epsilon R$ and any positive integer $n \geq 2$, since $(n, n+1) = 1$,

we get that

$$x_{i+1} a = x_{i_1}(i_1 + 1) + \cdots, x_{[i_1(i_1+1)+1]} a = x_{j_1} + \cdots,$$

where $j_1 = i_1(i_1 + 1)[i_1(i_1 + 1) + 1]$,....Thus, if $a \epsilon r_R(T)$, then necessarily $a = 0$,hence $r_R(R) \subseteq r_R(T) = 0$. So $R$is not strong left zero-divisor.

For a ring $R$with a ring endomorphism $\alpha: R \to R$,a skew polynomial ring $R[x\,;\alpha]$of $R$is the ring obtained by giving the polynomial ring over $R$with the new multiplication $xr = \alpha(r)x$

for all $r \epsilon R$.

Theorem 2.3*Let Rbe a ring and $\alpha: R \to R$,an epimorphism. Then R is strong left zero- divisor if and only if so is $R[x\,;\alpha]$.*

Proof If $Rb = 0$, then $R\alpha(b) = \alpha(R)\alpha(b) \subseteq \alpha(Rb) = 0$, hence $\alpha\big(r_R(R)\big) \subseteq r_R(R)$.Now assume that $R$is strong left zero-divisor, then $T = r_R(R) \neq 0$. For every $f(x) = \sum_{i=0}^{n} a_i x^i \epsilon (R[x\,;\alpha])$,

taking any $0 \neq t(x) = \sum_{j-0}^{m} b_j x^j \epsilon T[x;\alpha] \subseteq R[x;\alpha]$, we obtain

$$f(x)t(x) = \sum_{k=0}^{m+n} \sum_{i+j=k} a_i \alpha^i (b_j) x^k = 0$$

Hence $r_{R[x;\alpha]}(R[x;\alpha]) \neq 0$

Conversely, assume that $R[x;\alpha]$ is strong left zero-divisor. For any $0 \neq f(x) = \sum_{i=0}^{n} a_i x^i \epsilon r_{R[x;\alpha]}(R[x;\alpha])$, there exists at least one $a_{i_k} \neq 0, 0 \leq i_k \leq n, a_{i_k} \epsilon R$. Note that and $R \subseteq R[x;\alpha]$

$Rf(x) = 0$. It follows that $R_{aik} = 0$ and $r_R(R) \neq 0$.

Theorem 2.3 answers partially the question raised in the above section.

Recall that for an infinite set of commuting indeterminate $\{x_\lambda\}$ over R, Gilmer-Grams [3]

defined rings

$R[\{x_\lambda\}] = \cup\{R[F] \mid F \text{is a finite subset of } \{x_\lambda\}\}$ and

$R[[\{x_\lambda\}]] = \cup\{R[[F]] \mid F \text{is a finite subset of } \{x_\lambda\}\}$

Theorem 2.4 *Let R be a ring. Then the following statements are equivalent:*

(1) R is strong left zero-divisor.

(2) $T_n(R)$ is strong left zero-divisor for any $n \epsilon \mathbb{N}$.

(3) $QM_2(R)$ is strong left zero-divisor.

(4) $S_n(R)$ is strong left zero-divisor for any $n \epsilon \mathbb{N}$.

(5) $R[x]/(x^n)$ is strong left zero-divisor for any $n \epsilon \mathbb{N}$.

(6) $T(R,R)$ is strong left zero-divisor.

(7) $R[x; x^{-1}]$ is strong left zero-divisor.

(8) $R[\{x_\lambda\}]$*is strong left zero-divisor.*

(9) $R[[\{x_\lambda\}]]$*is strong left zero-divisor.*

Proof Note that if $R$is strong left zero-divisor, then $S = r_R(R) \neq 0$and there exists $0 \neq t(\{x_\lambda\}) \epsilon S[\{x_\lambda\}] \subseteq S[[\{x_\lambda\}]]$such that $R[\{x_\lambda\}]t(\{x_\lambda\}) = 0\ (R[[\{x_\lambda\}]]t(\{x_\lambda\}) = 0)$, hence $R[\{x_\lambda\}](R[[\{x_\lambda\}]])$is strong left zero-divisor. It follows that (1) ⇔ (8)and (1) ⇔ (9).

Making a little medications in the proof of Theorem 1.3, we can prove that (1) ⇔ (2) ⇔ (3) ⇔ (4) ⇔ (5) ⇔ (6).

By Theorem 2.3, we know that $R$is strong left zero-divisor if and only if so is $R[x]$.By analogy with the proof of Proposition 1.4, it is easy to prove that (1) ⇔ (7).

Theorem 2.5*A ring* R *is strong left zero-divisor if and only if so is* $M_n(R)$,*the ring o f* $n \times n$*matrices over* R*, for any positive integer* nn.

proof Assume that $R$is strong left zero-divisor and $A = (a_{ij}) \epsilon M_n(R)$. Then $r_R(R) \neq 0$. For any $0 \neq r \epsilon r_R(R)$,we have $a_{ij}r = 0, \forall 1 \leq i, j \leq n$. Putting $T = (t_{ij}) \epsilon M_n(R)$,where $t_{ii} = r$ and $t_{ij} = 0$ if $i \neq j, 1 \leq i, j \leq n$,we get that $T \neq 0$ and $AT = 0$. Hence $r_{M_n}(R)(M_n(R)) \neq 0$

because A is arbitrary.

Conversely, assume that $(M_n(R)$ is strong left zero-divisor and $r \epsilon R$. Take any $0 \neq A = a_{ij} \epsilon r_{M_{n(R)}}(M_n(R)) \neq 0$, and suppose that some $a_{kl} \neq 0, 1 \leq k, l \leq n$. If we put = (t_{ij})as above, then from $TA = 0$one can get that $ra_{kl} = 0$.. This implies that $a_{kl} \epsilon r_R(R) \neq 0$.

Given a monoid $G$and a ring R, we use $R[G]$to denote the monoid ring of Gover R.

Theorem 2.6*A ring* R *is strong left zero-divisor if and only if so is*$R[G]$*for any monoid*G.

Proof Assume that $r_R(R) \neq 0$ and $\sum r_i g_i \epsilon R[G]$. For any $0 \neq a \epsilon r_R(R)$ we have $(\sum r_i g_i)(ae)$, where $e$is the identity of G. Thus $0 \neq ae \epsilon r_{R[G]}(R[G])$.

Conversely, assume that $R[G]$ is strong left zero-divisor and $a \epsilon R$. If $0 \neq \sum r_i g_i \epsilon r_{R[G]}(R[G])$, then from= $(ae)(\sum r_i g_i = \sum(a_i r_i) g_i$we get that $ar_i = 0$ for any i. This shows that $r_i \epsilon r_R(R)$ for any i, and $r_R(R) \neq 0$.

Let Gdenote a group with identity e, and $R = \bigoplus_{g \epsilon G} R_g$be a G-graded ring. Beattie [1] defined the generalized smash product $R\#G^*$of R and $G$to be the free left R-module $\bigoplus_{g \epsilon G} RP_g$with multiplication defined for elements aP_g and $bP_h$by $(aP_g)(bP_h) = ab_{gh^{-1}}P_h$,and extended to general elements of $R\#G^*$by linearity.

Theorem 2.7*Let $R = \bigoplus_{g \epsilon G} R_g$ be a G-graded ring. Then R is strong left zero-divisor if andonly if so is$R\#G^*$*

Proof Assume that $r_R(R) \neq 0$and $\sum a_i P_{g_i} \epsilon R\#$. Take any $0 \neq r \epsilon r_R(R)$. Since $r_R(R)$is a graded ideal of R, $\left(\sum a_i P_{g_i}\right) r P_e = \sum a_i r_{g_i} P_e = 0$. This implies that $0 \neq r P_e \epsilon r_{R\#G^*}(R\#G^*)$.

Conversely, assume that $R\#G^*$is strong left zero-divisor. Taking

$$0 \neq \sum_i a^{(i)} P_{g_i} \epsilon r_{R\#G^*}(r_{R\#G^*})$$

we get that $0 = r_g P_h\left(\sum_i a^{(i)} P_{g_i}\right) = \sum_i r_g a^{(i)}_{hg_i^{-1}} P_{g_i}$for any $g, h \epsilon G$ and $r_g \epsilon R_g$. Thus for every $g_i \epsilon G, r_g a^{(i)}_{hg_i^{-1}} = 0$. If $a^{(i_0)} \neq 0$,If $a^{(i_0)} \neq 0$, then there exists an $h_0 \epsilon G$such that $a^{(i_0)}_{h_0 g_{i_0}^{-1}} \neq 0$,and hence $a^{(i_0)}_{h_0 g_{i_0}^{-1}} \epsilon r_R(r_g) \neq 0$. Since $g \epsilon G$and $r_g \epsilon R_g$ are arbitrary, we have $a^{(i_0)}_{h_0 g_{i_0}^{-1}} \epsilon r_R(R)$.

Camilla-Nielson [2] introduced the concept of right finite annihilated rings (in short, RFArings) to describe exactly when a direct product or direct sum of rings is right McCoy. A ring$R$ is calledRFAif every finite subset of Rhas a nonzero right annihilator.

Clearly, strong left zero-divisor rings are RFA rings, but the converse does not hold.

Example 2.8 Let $R = \mathbb{Z}[x_1, x_2, x_3, \dots]/(x_1^2, x_2^3, x_3^4, \dots)$,and $A = \langle \overline{x_1}, \overline{x_2}, \overline{x_3} \dots \rangle$be the ideal of Rgenerated by $\overline{x_1}, \overline{x_2}, \overline{x_3}, \dots$ Then $A$is nil, left zero-divisor and RFA. But $A$is neither nilpotent nor strong left zero-divisor.

For RFA rings, we have the following

Proposition 2.9*Let R be a ring and $S = \{(a_n)_{n=1}^{\infty} \in \prod R \mid a_n \text{ is a eventually constant}\}$, a subring of the countable direct product $\prod_{n=1}^{\infty} R$ Then ring R is RFA if and only if so is S.*

ProofIt is a trivial verification.

Theorem 2.10*Let R be a ring. Then the following statements are equivalent:*

(1) $R$is RFA.

(2) $T_n(R)$is RFA for any $n \in \mathbb{N}$.

(3) $QM_2(R)$is RFA.

(4) $S_n(R)$is RFA for any $n \in \mathbb{N}$.

(5) $R[x] = (x_n)$is RFA for any $n \in \mathbb{N}$.

(6) $T(R, R)$ is RFA.

(7) $R[x, x^{-1}]$is RFA.

(8)$R[\{x_\lambda\}]$is RFA

Proof (1) ⇔ (2). Assume that $F = \{A_k = (a_{ij}^k) \epsilon T_n(R), k = 1,2,\dots,m\}$is a finite subsetof $T_n(R)$. Then $E = \{a_{ij}^k \mid 1 \le i,j \le n, k = 1,2,\dots,m\}$is a finite subset of R, there exists$0 \neq t \in R$such that $a_{ij}^k t = 0$ for every $a_{ij}^k (1 \le i,j \le n, 1 \le k \le m)$ since R is RFA. Putting$D = (d_{ij}) \epsilon T_n(R)$with $d_{11} = t$and zeros elsewhere, we have that $A_k D = 0$for $1 \le i,j \le n$.

(2) ⇔ (3). Holds since $QM_2(R) \cong T_2(R)$.

(3) ⇔ (1). For any finite subset $F$of $R, E = \{A_r = \begin{pmatrix} r & 0 \\ 0 & r \end{pmatrix} \mid r \epsilon F\}$is a finite subset of $QM_2(R)$ Then there exists $0 \neq T = \begin{pmatrix} a & b \\ c & d \end{pmatrix} \epsilon\, QM_2(R)$ such that $A_r T = 0$for every $r \epsilon F$, it follows that $ra = rb = rc = rd = 0$. Notice that $T \neq 0$, there is $0 \neq s \epsilon R$such that $Fs = 0$,as desired.

(1) ⇔ (4). Let $F = \{A_k = (a_{ij}^k) \epsilon S_n(R), k = 1,2,\dots,m\}$ be a finite subset of $S_n(R)$.Then$E = \{a_{ij}^k \mid 1 \le i,j \le n, k = 1,2,\dots,m\}$is a finite subset of R, there exists $0 \neq t \epsilon R$such that$a_{ij}^k = 0$for every $a_{ij}^k (1 \le i,j \le n, 1 \le k \le m)$since$R$is RFA.Taking $0 \neq T = (t_{ij}) \epsilon\, S_n(R)$with $t_{1n} = t$and zeros elsewhere, we obtain that $A_k T = 0$for $1 \le k \le m$.

(4) ⇔ (5). Holds by $\frac{R[x]}{x^n} \cong S_n(R)$.

(5) ⇔ (6). Follows from$T(R,R) \cong R[x]/(x^2)$.

(6) ⇔ (1). Let Fbe a finite subset of $R$and $E = \{A_r = \begin{pmatrix} r & 0 \\ 0 & r \end{pmatrix} \mid r \epsilon F\}$. Then there exists $0 \neq T = \begin{pmatrix} t & m \\ 0 & t \end{pmatrix} \epsilon\, T(R,R)$such that $A_r T = 0$for any $r \epsilon F$it follows that $rt = 0$ and $rm = 0$. Notice that $T \neq 0$, we have that $t \neq 0$or $m \neq 0$.Consequently in any case there is$0 \neq s \epsilon R0$such that $Fs = 0$, as desired.

(1) ⇔ (8). Let $E = \{f_i\{x_\lambda\} \mid i = 1,2,\dots,m\}$be a finite subset of $R[\{x_\lambda\}]$. Then $E \subseteq R[F]$for some finite subset $F$of $\{x_\lambda\}$, and the set $H$of coefficients of all $f_i\{x_\lambda\} \subseteq E$ is a finite subset of R. Hence there exists

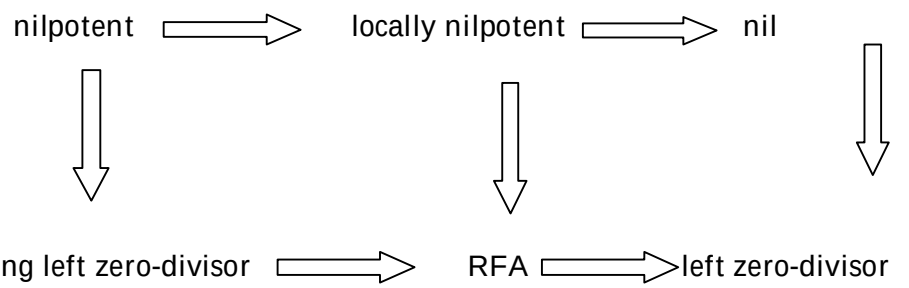
$0 \neq t \in R$ such that $Ht = 0$, it follows that $f_i\{x_\lambda\}t = 0 if f x_\lambda gt = 0$ for $1 \leq k \leq m$.

(8) $\Leftrightarrow$ (1). Let Ebe a finite subset of R. Then $E \subseteq R[\{x_\lambda\}]$, and there exists $0 \neq f\{x_\lambda\} \in R[\{x_\lambda\}]$such that $Ef\{x_\lambda\} = 0$ Thus $Ea = 0$for any nonzero coeficient $a$of $f\{x_\lambda\}$.

(1) $\Leftrightarrow$ (7). The proof is analogous to that of (1) $\Leftrightarrow$ (8).

Example 2.11 Consider the ring $R = \begin{pmatrix} 0 & \mathbb{Z} & \mathbb{Z} \\ 0 & 0 & \mathbb{Z} \\ 0 & 0 & \mathbb{Z} \end{pmatrix}$. For any $A = \begin{pmatrix} 0 & a & b \\ 0 & 0 & c \\ 0 & 0 & d \end{pmatrix} \in RandT = \begin{pmatrix} 0 & 0 & 1 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix}$ we have $AT = 0$, which implies that $s$is strong left zero-divisor.

We conclude this paper with the following chart:



No other implications hold (except by transitivity). Note that Example 2.11 shows that a strong left zero-divisor, left zero-divisor andRFA ring are not necessarily nilpotent, nil and locally nilpotent, respectively; and Example 20.2 in Szasz [6] also shows that a left zero-divisor ring is not necessarily an RFA ring

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(ఆచార్య ఎస్ గంగప్ప వారి బాల గేయాలు – సమసమానత్వం)

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మనిషిని ఆలోచింపచేసి, ఆలోచనా మార్గాన్ని అన్వేషింపచేసే శక్తి సాహిత్యాలకు మాత్రమే పుంది. తెలుగు సాహిత్యంలో ఎంతో మంది కపులు తమ భావాలను కలం ద్వారా సమాజానికి పరిచయం చేశారు. సాహిత్య ప్రక్రియలో "గేయం" ప్రత్యేక స్థానం అలకరించుకుంది. గేయ ప్రక్రియ వివిధ రకాలుగా రూపాంతరం చెందింది. సాహిత్యం వ్యక్తిత్వ వికాసాన్ని జతచేసి 'శ్రావ్యత'తో ఆలోచించినపుడే అది విద్యార్థులను మేల్కొలుపుతుంది.

ఈనాటి విద్యా విధానం చూసినట్లైతే మన అవసరాలకు, మన పరిసరాలకూ అనుగుణంగా లేదని అందరికీ తెలిసిందే "చదువు" అంటే అందరిలో ఒకరికి ర్యాంకులు రావడం కాదు, అందరికీ జ్ఞానం కలగడం. స్వతంత్ర్యంగా తమ నిర్ణయాలను తెలపడం. ఇప్పుడున్న కాలంలో మనిషి యాంత్రిక జీవితాలకి అలవాటు పడుతున్నాడు. దీనికి కారణం విద్యావ్యవస్థలో సరైన మార్గాలు లేకపోవడమే.

ఈ రోజు పిల్లల చదువు సంధ్యల వి షయం చెప్పనక్కర్లేదు. ఒక ముద్దు ముచ్చటాలేదు. ఒక సరదా సంబరమూ లేదు. ఎంతసేపు డాడీ, మమ్మీ అనిపించడం, మన వాడికి ఆంగ్లభాష వచ్చిందనే సంబరములో పడిపోతున్న తల్లిదండ్రులు అనేకం. కానీ వాడి మాతృభాష మరచిపోతున్నాడనే సంగతి మరచిపోతున్నారు.

విమర్శనాత్మక రచనలనే కాక సృజనాత్మక సాహితీ సృష్టిలోను చేయి వేసి సెభాష్ అనిపించు కొన్న రచయిత ఆచార్య ఎస్. గంగప్ప బాలసాహిత్య సృష్టిలోనూ తనదైన శైలిని చూపారు.

అంతర్జాతీయ బాలల సంవత్సరంలో ఆచార్య గంగప్పగారు చేసిన కృషికి ఫలమే బాలగేయాలు. మొత్తం 48 ఖండిక లున్నాయి. పాడుకోవడానికి, ఆడుకోవడానికి, ఆలోచనాత్మకంగా మర్చడానికి ఇవి ఎంతో ముఖ్యమైనవి. పిల్లలను కేవలం పుస్తకాల పురుగుల్లా మార్చే స్థితి నుండి తొలగించి ఆటపాటలతో పిల్లలకు చదువు సంధ్యలు నేర్పవచ్చునని నిరూపించారు.

ఈ గేయాలలో ప్రకృతి, ప్రకృతిలోని వస్తువులు, ప్రాణులు, వైజ్ఞానిక రంగంలో మనం సాధించిన ప్రగతి, యంత్రాలు, మొ॥లైన సంగతులు చెబుతూ నీతని, సందేశాన్ని పిల్లలు మెలగవలసిన తీరుతెన్నులు, అలవరచుకోవలసిన గురుభక్తినీ, దేశభక్తినీ పెంచుకోవలసిన మంచినీ, మానవతను సృష్టం చేశారు రచయిత. వీటిలో కొన్ని మీకు పరిచయం చేస్తాము.

అందమైన బాలలం

అందమైన బాలలం ఆ
నందమైన బాలలం
రంగు రంగుల మెరిసే పువ్వులం ।।అందమైన।।
ఖంగు ఖంగున మ్రోగే మువ్వలం
కిలకిల పలికే చిలకలం
గల గల కులికే వలపులం
ముద్దు ముద్దుగా మురిసే చిట్టిపొరులం
పెద్దల కలలను పండించే భావిపౌరులం
భారత జాతినీతి రక్షకులం
భారతాభివృద్ధి సంరక్షకుల

జీవితానికో లక్ష్యం

పిట్టలు పిట్టలు – ఆకాశంలో
పిట్టలు పిట్టలు ।।పిట్టలు ।।
బారులు బారులుగా పోతున్నాయి
దారులు దారులు చూపుతున్నాయి
నీలి నీలి మెయిళ్ళు నింగిని వెలిశాయి
పాలలాంటి పిట్టలు పసందుగా వెలిగాయి
స్వేచ్ఛగాను బతుకుతాయి
స్వతంత్రంగా ఉంటాయి
అయినా ఉన్నది జీవితానికో లక్ష్యం
అదే వాటి జీవిత గమ్యానికి సాక్ష్యం

అనందం కూర్చాలి

అమ్మకొట్టింది
నాన్న తిట్టాడు ।। అమ్మా ।।
అందమైన బామ్మలాంటి చిట్టి
హంసలాంటి తెల్లటి పావడా గట్టి
పాడు చేసుకొంది బురద మెట్టి
పావడాకు పాప – గట్టిగా

అచ్చెరువు గొలిపే గడుగ్గాయి చిట్టి
అట్టె పట్టబోగా తుర్రుమంది పిట్ట
చుట్టూ తిండికి తిరిగే చీమను పట్టి
కుట్టగా నేలకేసి కసిగా కొట్టింది
హాయిగాను మనము బతకాలి
అక్కాయి అన్నాయిలతో మెలగాలి
నేస్తాలలో గొడవ లేక తిరగాలి
అమ్మా నాన్నలకి ఆనందం కూర్చాలి

అంతర్జాతీయులం మేము

చిట్టి పొట్టి పిల్లలం
చింతలేని పిల్లలం ।। చిట్టి ।।
జాతిమతాలు లేవు మాకు
కులవర్ణాలు లేవు మాకు
మానవత మాజాతి
మమతయే మా మతం
జాలి తలచటం మా కులం
కరుణ చూపడం మా వర్ణం
మాకు కలవు సమతలు
మాకు లేవు సీమలు
జాతీయులమే కాదు – అంత
ర్జాతీయులం మేము

మానవతా వాదులం

మానవతా వాదులం
మంగళ ప్రదాతలం
మంచిని పెంచి ప్రోది చేస్తాం
చెడ్డని గోతిలో పాతేస్తాం
అసలుసిసలైన మొక్కల్ని పెంచుతాం
నసిగాని కలుపు మొక్కల్ని తుంచుతాం ।। మానవతా।।

విద్య విలసిల్లాలి

తొలగాలి తొలగాలి అజ్ఞానపు చీకటులు
వెలగాలి విజ్ఞానపు జ్యోతులు
ఒకనాడు గుళ్ళులేనివి లేవు ఊళ్ళు
అలనాడు బళ్ళుగా వెలశాయి గుళ్ళు
ఈనాడు గుళ్ళుకాదు కావాలి బళ్ళు
చక్కటి గురుశిష్య బంధం వెలిసే బళ్ళు ।।తొలగాలి।।

వందనం పాఠశాలామ తల్లీ

వందనం పాఠశాలమతల్లే - శత
వందనం మాతేట తెలుగుతల్లీ
విజ్ఞానపు నిధి తెలుగు పాఠశాల
సాటిలేని తెలివి తేటల తెలుగుబాల
సిరిసంపద కళల కాణాచి తెలుగునేల
తిరుగులేక అరుగులేక వెలుగునేల ।। వందనం।।

రాముడు రహీము క్రీస్తులు
జాతిమత రహితులైన దోస్తులు
కావాలి బాలలందరు నేస్తులు
పురోగమోచాలి దేశస్థులు ।।వందనం।।

ఆలోచనాత్మకంగా అలసట తేరేవిధంగా ఆరోగ్యకరంగా ఉండేటువంటివి ఎన్నో బాలగేయాలను గంగప్పగారి కాలం నుండి జాలువారాయి. పిల్లలకు సమాజాన్ని గురించి స్పృహ కలిగించే ఈ గేయాలు ఎంతో ప్రాముఖ్యాన్ని సంతరించుకున్నాయి. విశ్వమానవ ప్రేమను, వసుదైక కుటుంబ భావనను ప్రభోధించే ఈ గేయాలలో విలువలు అందరూ గ్రహించడం ఎంతైనా అవసరం.

References (ఆధార గ్రంథాలు)ః

బాలగేయాలు - డా।। ఎన్. గంగప్ప

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PHYSICAL EDUCATION IN ANCIENT INDIA

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Abstract:

India has had a long history of physical instruction, much more old than Greece. However, in our times When the Olympic Games happening at regular intervals have turned out to be likely the greatest planetary occasion, a great many people realize that the Games began more than two thousand years back in Greece. Likewise, Greeks have given the Western world through numerous delightful statues a sharp feeling of substantial flawlessness, a perfect of physical excellence unbeatable right up 'til the present time. There was such an accentuation on the significance of excellence and physical abilities that a portion of the most elevated respects in Greek society were gave on competitors, to a degree obscure before and phenomenal since. Paper deals with the history of physical education in India

Keywords: Divine, History, Physical Education, Origin

Introduction:

India had as of now an extremely refined society maybe a couple centuries at any rate before the Greek arousing around 800 B.C. However, in the event that antiquated Greeks are effortlessly seen as exceptionally physical in their distractions, Indians interestingly are somewhat seen as otherworldly creatures, barely keen on material things. What's more, it is to be sure genuine that at a specific phase of the improvement of Indian culture, a profound impact has been thrown

on Indian aggregate mind, achieving an inclination to consider physical life as fairly incredible.[1]

However India is likewise surely understood as the local spot of Yoga. Consequently learning about body and soul and techniques proper to flawlessness of body and soul could advance in India. Might this be able to have happened in a domain for the most part not interested in physical activities and physical instruction?

We ought to recall the legends that India provided for herself who rep hate awesome characteristics of boldness and valor as well as of physical quality and fabulousness. Here is the manner by which Valmiki. depicts Rama in the opening verses of the Ramayana:

There is a celebrated lord by the name of Rama, conceived in the line of incredible Ikshwaku. He is of stifled sense and of surpassing may. He has powerful arms coming to the knees. His throat is set apart with three promising conch shell lines. He has high and expansive shoulders, all around shaped head, effortless brow, most grounded jaws, and profoundly inserted neckline bones. His eyes are substantial, and his shading is of delicate shiny green. He is neither excessively tall, nor short, yet very much shaped and of symmetrical appendages. This exceedingly lovely and strong Rama is especially savvy, and of smooth discourse.

Hundreds of years after the fact, Rama was portrayed again by the writer Kalidasa resounding Valmiki's depiction:

Youthful, with arms long as the shaft of the burden, with solid shoulders, with a mid-section wide as an entryway board, and a full wide neck, Raghu was over his dad by the greatness of his body, but then through his unobtrusiveness he looked littler.

[1] (Taittiriya Upanishad, 2.1)

Give us a chance to consider Arjuna, portrayed in Mahabharata:

Without him whose arms are long and symmetrical, and forceful and like unto a few iron maces and round and set apart by the scars of the bow-strings and graced with the bow and sword and different weapons and encompassed with brilliant armlets and like unto two or three five-headed snakes, without that tiger among men the sky itself seemeth to be without the sun.

So also for Bhima,

whose body was wonderfully proportioned, immaculate example of masculinity with his wide mid-section, thin waist and slender hips.

what's more, Kama,

tall like a brilliant palm tree equipped for killing a lion.

what's more, numerous others, enriched with brilliant bodies, whose deeds of quality, perseverance and dexterity fill the pages of Mahabharata. These legends are not digest pictures, their bodies are not less applauded than their dedication to dharma, their steadfastness , their commitment or their liberality. [2]

What was the mystery of this superhuman power of body and psyche which we see throbbing in the legends of Ramayana and Mahabharata? What was, it that remained behind a human advancement which delivered such characters? Without an extraordinary and exceptional order including an impeccable training of body, soul and brain, this would have been unthinkable. We will see later how physical training was a necessary part of the instructive educational modules, however first it must be said that, at the premise of the antiquated arrangement of training was the exceedingly essential order of Brahmacharya. Antiquated Indians realized that, similarly a wave is not separate from

[2] (Rig-Veda, 3.53.18)

the sea, man is not separate from the universe and the all inclusive vitality. The same power which moves in stars and planets moves in man. Also, they realized that the wellspring of vitality is profound however in the physical world the premise, the establishment on which it stands is physical. Man can expand his ability as a container of this vitality. By the order of Brahmacharya, by keeping alive his smoldering yearning for the learning of the Brahman, by having control over his wishes and interests, by keeping up an open perspective, he can hold and even to a great extent build vitality in his spirit, mind and body.

Furthermore, for sure, on the off chance that we swing to the old messages, the Vedas and Upanishads, we will see that the body, a long way from being viewed by otherworldly seekers as a hindrance, something to be disposed of, was considered as a repository for quality (bald}. Quality was among physical qualities the most applauded:

The presence of the world is subject to quality. Be given to quality.

We discover various supplications asking that quality may be given: [3]

Furnish our body with quality, O Indra, shower quality in our bulls. Shower quality for life on our offspring. You are verily the bestower of quality.

Thou craftsmanship quality, offer magnificence on me. [4]

Thou craftsmanship intensity, offer power on me.

Thou craftsmanship quality, offer quality on me.

Thou craftsmanship virility, offer virility on me.

Thou craftsmanship power of activity, offer the same on me.

Thou craftsmanship ability, offer ability on me. [5]

[3] (Chhandogya Upanishad 7.8.1)

[4] (Rig-Veda, 3.53.18)

The instructor and his understudy are as one joined in a goal to wind up solid:

Together may we make unto us quality and virility.

There was a considerable measure of gratefulness about the individuals who were solid, forceful and possessing energy and might. Up to twenty-two descriptive words in Sanskrit can be utilized to commend the solid! The Rishis of the Vedas and Upanishads had faith in a body with firm appendages, solid and hard like stone:

May our body get to be invulnerable like a stone.

Amid the Vedic and the Upanishadic periods, and even later, there was an accentuation on the quest for a fundamental point of life, which prevent mined the order of indispensable training. Both the material and profound shafts of the being had their place in this framework. The old Sanskrit saying "Shariram adyam khalu dharma sadhanam" (a sound body is the veritable instrument of the quest for the perfect law of life) underlined the significance of physical training. What's more, without a doubt it involved an imperative spot in the. instructive educational programs. Among the vast assortment of sciences and expressions offered to understudies, 3 Upavedas, or sciences, were somehow identified with the training of the body: the Upaveda of Rigveda, called Ayurveda (the science and specialty of sustenance, assurance and support of long life); the Upaveda of Yajurveda, called Dhanurveda (science managing weapons of war and craft of fighting); and the Upaveda of Samaveda, called Gandharvaveda (investigation of music, singing, moving and shows). [6]

When one studies Ayurveda, the genuine degree of the significance given by old India to the body, its appropriate advancement and its

[5] (Yajur-Veda, 19.9)

[6] (Rig-Veda6.75.12)

legitimate preparing, stands completely uncovered. Ayurveda, otherwise called the science for prolongation of life, makes an intensive investigation of the human body, its distinctive sorts and needs, and proposes as needs be particular activities and strategies for ideal body improvement, with accentuation on quality and spryness. There are numerous essential parts of Ayurveda, for example, its art of nourishment and others; yet in a matter of seconds we might focus on its perspectives on physical activities. In Ayurveda, quality was considered as the premise of wellbeing and physical advancement. By the procurement of quality, every single inner organ, the heart, the cerebrum, the lungs, the liver and the kidneys, the outside faculties, the appendages, should have the capacity to play out their capacities with no issue or turmoil.

Activity or Vyayama was viewed as the surest method for gaining quality. In this way, the learning of physical activities, their temperament, sorts, careful measure of activity, advantages of activity and even contra signs and numerous insights about the study of activity were incorporated into the educational programs expounded by Ayurveda. To give a little case of how point by point were the remedies, it was said, for occasion, that the presence of sweat on the nose, the brow, the joints of hands and legs and dryness in the mouth were the side effects which demonstrated that one has taken activity to the half degree of one's ability. Activity was likewise utilized by the antiquated doctors as a methodology of treatment, as in modem medicinal science. For a portion of the illnesses certain activities were recommended however activities could be restricted out and out in other particular cases. [7]

Ayurveda unequivocally encouraged to practice in right measure. Susruta suggests every day exercise, since it prompts the advancement

[7] Charaka hitha……p.78-106

of the composition of the body, reinforces and shapes the muscles, enhances the longing and delivers gentility in the body, helps in warding off sluggishness and offers energy to persevere through diligent work, mental strain, thirst, frosty or heat. Stupidity and decrepit rot never approach him who practices legitimately, and the muscles of his body stay firm and relentless. Charaka relates the wellness of the body with a non-unhealthy presence: the man who is proportional in tissue, well-weave in figure, and firm of sense is not prone to be overwhelmed by vicious sickness.

Physical activity realizes softness, ability to work, steadiness, safety to diseases, end of morbidities and in addition a decent digestion system. [8]

At the base of Ayurveda is a vital refinement between various sorts of bodies: the body can be of three sorts: Sthula (corpulent), Madhya (medium) and Krsa (dainty). In any case, Ayurveda holds that each individual has his own particular physical identity past these sorts and it ought to be perceived all things considered. Of the three sorts the medium sort identity is viewed as best by Ayurveda. There is another grouping of body sorts based upon the dominance of the three fundamental humors, Vata (wind). Pitta (bile), Kapha (mucus). So there are Vata sorts, Pitta sorts and Kapha sorts. The perfect is to have the three humors similarly adjusted, which prompts immaculate wellbeing. For every sort of body distinctive regimens are recommended. What's more, there are different elements impacting the identity, which are to be mulled over before one starts to take physical activity, for example, quality, diet, and also the period of the year and the physical way of the nation.[9]

One imperative result of a customary routine of suitable physical activity is the symmetrical improvement of body parts. The idea of such

[8] (Charaka 7.32)

[9] Vyayama shashra puritha manusmri p.iv

improvement was very explained in Ayurveda. The Sanskrit writing of the epic time frame has sufficient references portraying the perfect symmetrical body: the neck is solid and stable, the shoulders are expansive and strong, the arms long and overwhelming, the mid-section wide, the waist or support thin like conch, the temple wide and the head round, and so forth. Charaka and Susruta both have portrayed such perfect advancement. They gave minute portrayals of all aspects of the body and of the signs and side effects of their ideal and perfect improvement. They depicted all parts of the body, up to the littlest, from the sole of the feet up to the surface of hairs. Charaka has depicted perfect and proportionate advancement of around thirty three unique parts.

Ayurveda has now and again been called "the art of positive wellbeing", and it is self-evident, if just through the brief notes given over, that at its premise was an unlimited information about the human body, a hypothetical learning as well as an exceptionally down to earth one that had been explained through perception and experimentation.

Of the three Upavedas concentrated on by the young fellows of old India, the second was Dhanurveda. Dissimilar to the name proposes, it doesn't only manage arrow based weaponry, however remains for the investigation of all weapons of war. A military preparing was offered for the most part to kshatriyas yet a long way from only. Firstly, it is intriguing to call attention to that the educators of Dhanurveda (like Dronacharya, the instructor of the Pandavas and the Kauravas) were particularly from the brahmana class. Besides, the Mahabharata alludes to the obtaining of learning about war and weapons for all the four varnas. Kautiliya additionally favors of the investment of vaishyas and shudras in the armed force. Consequently the well known thought that the military calling was the elite, imposing business model of the kshatriyas is without establishment.

To have the capacity to grow high capability in weapons and developments of war, one normally required a ton of continuance, quality, suppleness, speed and for the most part an abnormal state of physical wellness. Every one of these qualities must be produced through activities (Vyayama) and games like chasing (mrigaya). There was a particular preparing — including a great deal of physical effort— in different techniques for fighting. The armed forces comprised of four divisions ("chaturanga": steeds, infantry, elephants, war-chariots); aptitudes in expressions like steed riding, chariot-driving, elephant-riding were taught. Youthful warriors had likewise to take in the utilization of various types of weapons, for example, sword, spear, lance (tomara), hatchet, mace, nooses (pasha), slings, and so on.

Wrestling or Bahuyuddha (truly, battling with arms) was the main kind of battle without weapons. A wrestler should have an exact and point by point information of all the essential parts of the body (marma sthana), the nerves, the muscles, the joints and ligaments. Just with this learning might he be able to vanquish his adversary. In the Mahabharata, we locate a vivacious portrayal of a wrestling competition at the court of ruler Virata. Bhima, who lives there sequestered from everything, is known as the cook of the ruler. In any case, this remarkable cook is demonstrating that he is fit for astonishing physical accomplishments:[10]

What's more, there came competitors from all quarters by thousands, similar to hosts of celestials to the residence Brahma or Siva to witness that celebration. Furthermore, they were endued with gigantic bodies and extraordinary ability, similar to the evil presences called Kalakhanjas. What's more, elated with their ability and glad for their quality, they were exceptionally respected by the ruler. What's more, their shoulders and waists and necks resembled those of lions, and

[10] Asura Vritra pslm...9875.78

their bodies were perfect, and their hearts were comfortable. Also, they had numerous a period won achievement in the rundowns within the sight of lords. Also, amongst them there was one who towered over the rest and tested every one of them to a battle. What's more, there was none that challenged to approach him as he gladly stalked in the field. Furthermore, when the competitors stood miserable and disheartened, the ruler of the Matsyas made him battle with his cook. Also, asked by the ruler, Bhima decided reluctantly, for he couldn't straightforwardly ignore the illustrious command. What's more, that tiger among men then having venerated the ruler, entered the roomy field, pacing with the inconsiderate strides of a tiger. What's more, the child of Kunti then braced up his loins to the colossal pleasure of the observers. What's more, Bhima then summoned to the battle that competitor known by the name of Jimuta who resembled unto the Asura Vrita whose ability was generally known.[11] What's more, them two were had of awesome bravery, and both were endued with awful ability. Also, they resembled two or three incense and gigantic bodied elephants, every sixty years of age. Also, those courageous tigers among men then brightly occupied with a wrestling battle, envious of vanquishing each other. What's more, horrendous was the experience that occurred between them, similar to the conflict of the thunderbolt against the stony mountain-bosom. Also, them two were exceedingly intense, and to a great degree charmed at each other's quality. Furthermore, covetous of vanquishing each other, each stood willing to exploit his foe's omission. What's more, both were incredibly pleased and both looked like rankle elephants of immense size. What's more, different were the methods of assault and guard that they displayed with their held clench hands. Also, each dashed against the other and flung his foe to a separation. What's more, every cast the other down and squeezed him near the ground. What's more, each got up again and crushed the other in his arms. What's

[11] Vrikodara shashtra p.56-97

more, each diverted the other fiercely from his place by boxing him on the bosom. What's more, each got the other by the legs and spinning him round tossed him down on the ground. Also, they slapped each other with their palms that struck as hard as the thunderbolt. Furthermore, they additionally hit each other with their outstretched fingers, and extending them like lances push the nails into each other's body. Also, they gave each other vicious kicks. What's more, they struck knee and head against head, delivering the accident of one stone against another. Also, in this way that incensed battle between those warriors seethed on without weapons, managed mostly by the force of their arms and their physical and mental vitality, to the boundless pleasure of the con course of onlookers. And all individuals... took profound enthusiasm for that experience of those capable wrestlers who battled like Indra and the Asura Vritra.

What's more, they cheered them two with boisterous approvals of commendation. What's more, the expansive chested and since a long time ago furnished specialists in wrestling then pulled and squeezed and spun and flung down each other and hit each other with their knees, communicating at the same time their hatred for each other in uproarious voices. Furthermore, they started to battle with their uncovered arms along these lines, which resembled spiked maces of iron. What's more, finally the effective and strong equipped Bhima, the slayer of his enemies, yelling so anyone might hear grabbed the vociferous competitor by the arms even as the lion grabs the elephant, and taking him up starting from the earliest stage holding him up starting from the earliest stage holding him overtop, started to spin him round, to the immense wonder of the collected competitors and the general population of Matsya[12]. What's more, having spun him round, and cycle a hundred times till he was torpid, the solid equipped Vrikodara dashed him to death on the g found."

[12] Matsya 9.8.4.5.0

Conclusion:

Of the considerable number of specialties of war, arrow based weaponry was unquestionably the noblest. The one has propelled epic artists the most.

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A Study on Co - Γ- Ideals in Γ- Semigroups

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Abstract: In this paper some preliminaries and basic concept of Γ-semigroups were presented. In section 3, we introduced the terms co-Γ-ideals, subtractive are introduced in Γ-semigroups, and proved many results on co-Γ-ideals in Γ-semigroup.

Mathematical subject classification (2010): 20M07; 20M11; 20M12.

***Key Words*:** Γ-semigroup, subtractive, Γ-ideal, co-Γ-ideal, identity.

1. Introduction

The concept of a semigroup is very simple and plays a large role in the development of Mathematics. The theory of semigroups is similar to group theory and ring theory. The earliest major contributions to the theory of semigroups are strongly motivated by comparisons with groups and rings. Semigroup theory can be considered as one of the most successful off-springs of ring theory in the sense that the ring theory gives a clue how to develop the ideal theory of semigroups.In the year 2011,Madhusudhana Rao, Anjaneyulu and Gangadhara Rao[9] studied about pseudo symmetric Γ-ideals inΓ-semigroups and they developed the literature of Γ-ideals in Γ-semigroups. Later in the year 2013, Madhusudhana Rao, Anjaneyulu and Sarala developed the ternary ideal literature in ternary

semigroups. Further Madhusudhana Rao, V.B. Subramanyam. Sitamraju studied about partially ordered gamma semigroups. In the year 2014, Madhusudhana Rao and G. Srinivasa Rao studied the notion of ternary semirins. In this paper we developed co-Γ-ideals in Γ-semigroup.

2. Preliminaries

Definition 2.1[8]: Let S and Γ be two non-empty sets. Then S is called a ***Γ-semigroup*** if there exist a mapping from $S\times\Gamma\times S$ to S which maps $(a, \alpha, b) \to a\alpha b$ satisfying the condition: $(a\gamma b)\mu c = a\gamma(b\mu c)$ for all $a,b,c\in S$ and $\gamma,\mu\in\Gamma$.

Example2.2[8]: Let S be the set of all 2 × 3 matrices over Q, the set of rational numbers and Γ be the set of all 3 × 2 matrices over Q. Define AαB = usual matrix product of A, α, B; for all A, B ∈ S and for all α ∈ Γ. Then S is a Γ-semigroup. Note that S is not a semigroup.

Definition 2.3[8]: An element ***a*** of a Γ-semigroup S is said to be a ***left identity*** of S provided $a\alpha s = s$ for all $s \in S$ and $\alpha \in\Gamma$.

Definition 2.4[8]: An element '***a***' of a Γ-semigroup S is said to be a ***right identity*** of S provided $s\alpha a = s$ for all $s \in S$ and $\alpha \in \Gamma$.

Definition 2.5[8]: An element '***a***' of a Γ-semigroup S is said to be a ***two sided identity*** or an ***identity*** provided it is both a left identity and a right identity of S.

Definition 2.6[8]: Let S be a Γ-semigroup. A nonempty subset T of S is said to be a **Γ*-subsemigroup*** of S if $a\gamma b\in$ T, for all $a, b\in$ T and $\gamma\in\Gamma$.

Note 2.7[8]: A nonempty subset T of a Γ-semigroup S is a Γ-subsemigroup of S iff $T\Gamma T \subseteq T$.

Example 2.8[9]: Let S = [0,1] and Γ = {1/*n* : *n* is a positive integer}. Then S is a Γ-semigroup under the usual multiplication.Let T = [0,

1/2]. Now T is a nonempty subset of S and $a\gamma b \in$ T, for all *a*, *b*∈ T and $\gamma \in \Gamma$. Then T is a **Γ**-subsemigroup of S.

Definition2.9[8]: A nonempty subset A of a Γ-semigroup S is said to be a ***left Γ-ideal*** of S if $s \in S, a \in A, \alpha \in \Gamma$ implies $s\alpha a \in A$.

Note 2.10: A nonempty subset A of a Γ-semigroup S is aleft Γ- ideal of Siff SΓA⊆A.

Definition2.11[8]: A nonempty subset A of a Γ-semigroup S is said to be a ***right Γ-ideal*** of S if $s \in S, a \in A, \alpha \in \Gamma$ implies $a\alpha s \in A$.

Note 2.12: A nonempty subset A of a Γ-semigroup S is aright Γ- ideal of SiffAΓS⊆A.

Definition2.13[8]: A nonempty subset A of a Γ-semigroup S is said to be a ***two sided*Γ- *ideal*** orsimply a **Γ- *ideal***of S if *s* ∈ S, *a* ∈ A, $\alpha \in \Gamma$ imply $s\alpha a \in$ A, $a\alpha s \in$ A.

Note 2.14: A nonempty subset A of a Γ-semigroup S is atwo sided Γ-ideal iff it is both a left Γ-ideal and a right Γ-ideal of S.

Example 2.15[9]: Let *N* be the set of natural numbers and Γ=2N. Then N is a Γ-semigroup and A=3N is a Γ- ideal of the Γ-semigroup *N*.

Definition 2.16[8]: A Γ-ideal A of a Γ-semigroup S is said to be a ***proper Γ-ideal*** of S if A is different from S.

Definition 2.17[8]: A Γ-ideal A of a Γ-semigroup S is said to be a ***trivial Γ-ideal***provided S\A is singleton.

3. Co-Γ-Ideals in Γ-Semigroup

We define co-Γ-ideal of a Γ-semigroup, and investigate its properties.

Definition 3.1: A non-empty subset Aof aΓ-semigroup S is said to be a co-Γ-ideal provided

(1) $a, b \in A$, $\alpha \in \Gamma$ implies $a\alpha b \in A$,

(2) $a \in A$, $s \in S$ and $\alpha \in \Gamma$ implies $a\alpha s \in A$.

Note 3.2: A non-empty subset A of a Γ-semigroup S is a co-Γ-ideal of S iff $A\Gamma A \subseteq A$ and $A\Gamma S \subseteq A$.

Definition 3.3: A co-Γ-ideal I of a Γ-semigroup S is said to be subtractive provided $a, a\alpha b \in A$, $b \in S$ and $\alpha \in \Gamma$, then $b \in A$.

Theorem 3.4: Let A, B are co-Γ-ideal of aΓ-semigroup S. Then

(1) A∩ B is a co-Γ-ideal of S,

(2) AΓB is a co-Γ-ideal of S,

(3) AΓB⊆A∩ B.

***Proof*:** (1) Let $a, b \in A \cap B$ then $a, b \in A$ and $a, b \in B$. Since A, B are a co-Γ-ideals of S and hence $a\alpha b \in A$, $a\alpha b \in B$ for $\alpha \in \Gamma$. Hence $a\alpha b \in A \cap B$.

Let $a \in A \cap B$, $\alpha \in \Gamma$ and $s \in S$. $a \in A \cap B \Rightarrow a \in A$ and $a \in B \Rightarrow a \in A$ and $a \in B$, $\alpha \in \Gamma$ and $s \in S$, A, B are co-Γ-ideals of $S \Rightarrow a\alpha s \in A$ and $a\alpha s \in B$. Thus $a\alpha s \in A \cap B$. Hence $A \cap B$ is a co-Γ-ideal of S.

(2) Let $x \in a\Gamma b \subseteq A\Gamma B$, $y \in a'\Gamma b' \subseteq A\Gamma B$. Then

$x\Gamma y \subseteq (a\Gamma b)\Gamma(a'\Gamma b') = [(a\Gamma a')\Gamma(a\Gamma b')\Gamma(b\Gamma a')\Gamma(b\Gamma b')] \subseteq A\Gamma B$.

Therefore, $x\alpha y \in A\Gamma B$ for $\alpha \in \Gamma$.

Let $r \in S$ then $x\Gamma r = (a\Gamma b)\Gamma r \in A$, since A is a co-$\Gamma$-ideal of S. Hence $A\Gamma B$ is aco-Γ-ideal of S.

(3) Let $x = a\alpha b \in A\Gamma B$ where $a \in A$, $b \in B$, $\alpha \in \Gamma$. Now $a \in A$, $s \in S$, $\alpha \in \Gamma$ and A is a co-Γ-ideal implies $x = a\alpha b \in A$. Similarly, $x \in B$. Hence $x \in A \cap B$ so $A\Gamma B \subseteq A \cap B$.

Lemma 3.5. Every Γ-ideal of a Γ-semigroup S is a co-Γ-ideal of S.

***Proof*:** Let Ais aΓ-ideal ofΓ-semigroup of S and *a, b*∈A, α∈Γ. Then$a\alpha b$∈A. Let *a*∈A, α∈Γand *s*∈S then $a\alpha s$∈A, since Ais aΓ-ideal of S. Thus A is aco-Γ-ideal of S.

Theorem 3.6: Let A, Bbe subtractive co-Γ-ideals of aΓ-semigroup S. Then A∩ B is a subtractive co-Γ-ideal of S.

***Proof*:** By Theorem 3.4(1) we have A∩B is a co-Γ-ideal of S. If *a,* $a\alpha b$∈A∩B,*b*∈S, α∈Γ, then *b*∈A∩ B, since A, Bare subtractive co-Γ-ideals of Γ-semigroup S.

Theorem 3.7: Let A, Bbe subtractive co-Γ-ideals of aΓ-semigroup S. Then AΓB is a subtractive co-Γ-ideal of S.

***Proof*:** By Theorem 3.4(2) we have AΓB is a co-Γ-ideal of S. If *a, b,* $a\alpha b\beta c$∈AΓB,*c*∈S,
α, β∈Γ, then *c*∈AΓB, since A, Bare subtractive co-Γ-ideals of Γ-semigroup S.

Theorem 3.8:Let A, Bbe subtractive co-Γ-ideal of aΓ-semigroup S and *a*∈A, *b*∈B, *c*∈AΓB. Then the following conditions are equivalent

(1) $a\alpha b\beta c$∈AΓB for α, β∈Γ.

(2) *a*∈AΓB or *b*∈AΓB.

(3) *a, b*∈A or *a, b*∈B.

***Proof*:** (1) ⇒(2) Let $a\alpha b\beta c$∈AΓB. Without loss of generality assume that$a\alpha b\beta c$∈A. Since A is a subtractive co-Γ-ideal we have *b*∈A. Hence *b*∈AΓB.

(2) ⇒(3) Let *a*∈AΓB or *b*∈AΓB.We must to show that *a, b*∈A or*a, b*∈B

Case 1. If *a*∈AΓB,since A, B are subtractive co Γ-ideals, then *a*∈A and *a*∈B.

Case 2. If $b \in A\Gamma B$,since A, B are subtractive co Γ-ideals, then $b \in A$ and $b \in B$.

From case1.,2. we have $a, b \in A$ or $a, b \in B$.

(3) $\Rightarrow$(1) Let $a, b \in A$ or $a, b \in B$ then $a\alpha b \in A$ or $a\alpha b \in B$. Since A, B is asubtractive co-Γ-ideal and $c \in A\Gamma B$ we have $a\alpha b\beta c \in A\Gamma B$.

Theorem 3.9: Let A, B be subtractive co-Γ-ideals of aΓ-semigroup S and I be co-Γ-ideal of S such that IΓAΓB≠ ∅. Then I⊆AΓB if and only if I⊆A or I⊆B.

***Proof*:** Let $c \in I\Gamma A\Gamma B$. Let $I \subseteq A\Gamma B$ and $I \nsubseteq A$. Choose $a \in I$ such that $a \notin A$. Then $a \in B$. We claim that $I\Gamma A \subseteq B$. Let $b \in I\Gamma A$. Now$a, b, c \in I$ and I is a co-Γ-ideal implies that $a\Gamma b\Gamma c \subseteq I \subseteq A\Gamma B$. By Lemma 3.7, $a, b \in A$ or $a, b \in B$. Then $a, b \in B$, since $a \notin A$. Hence $I\Gamma A \subseteq B$. NowI = $I\Gamma(A\Gamma B) = (I\Gamma A)\Gamma(I\Gamma B) \subseteq B\Gamma B = B$. Converse is trivial.

Corollary 3.10: Let A, B be subtractive co-Γ-ideals of aΓ-semigroup Sand I be ideal of S such that AΓB≠ ∅. Then AΓB is co-Γ-ideal of S if and only if A⊆B or B ⊆A if and only if I⊆A or I⊆B.

Proof: Let $A\Gamma B$ is a co-Γ-ideal of S. Now $A\Gamma B \subseteq A\Gamma B$ and hence by Theorem 3.9,$A\Gamma B \subseteq A$ or $A\Gamma B \subseteq B$. Then $I \subseteq A$ or $I \subseteq B$.

Conversely let $I \subseteq A$ or $I \subseteq B$ to show that $A\Gamma B$ is a co-Γ-ideal. Let$a, b \in A\Gamma B$ then $a\gamma b \in A\Gamma B$, since A, B are subtractive co-Γ-ideals. Let$a \in A\Gamma B$ and $s \in S$ by Theorem 3.7, $A\Gamma B$ is a subtractive. Thus $a\alpha s \in A\Gamma B$.Hence $A\Gamma B$ is a co-Γ-ideal.

We study properties of co-Γ-ideal in Γ-semigroup Z_0^+.

Lemma 3.11: I_n = {$a \in Z_0^+$: a ≤ n} is a co-Γ-ideal of a Γ-semigroup Z_0^+, Γ = N.

Proof: Let $a, b \in I_n$ then $a, b \in Z_0^+$. Thus $a\Gamma b \subseteq Z_0^+$ so $a\Gamma b \subseteq I_n$. Let $a \in I_n$ and $s \in Z_0^+$ then $a\alpha s \in Z_0^+$ for $\alpha \in \Gamma$. Thus $a\alpha s \in I_n$. Hence I_n is a co-Γ-ideal of Z_0^+.

Theorem 3.12: A non-empty subset I of theΓ-semigroup Z_0^+ is a co-Γ-ideal if and only if $I = I_n$.

Proof: Assume that I is a co-Γ-ideal of Z_0^+. We must show that $I = I_n$. Since I is a non-empty, I has the largest element say n. Let $x \in I_n$ then $x \leq n$ and $x = ny$ for some $y \in Z_0^+$. Now $x \in I$, since I is a co-Γ-ideal. Hence $I_n \subseteq I$. But $I \subseteq I_n$. So $I = I_n$.

Conversely, Assume, that $I = I_n$ by Lemma 3.11, I_n is a co-Γ-ideal of Z_0^+. Thus I is a co-Γ-ideal of Z_0^+.

Conclusion

In this paper mainly we studied about co-Γ-ideals in Γ-semigroup and proved may results of co-Γ-ideals in Γ-semigroup.

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CREATION OF KNOWLEDGE –A FOCUS AREA AND THE ROLE OF TEACHERS IN UNDERGRADUATE COLLEGES

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"Inspire the teacher regardless of his Pay pack or position. He shall inspire the legions alumni....ah, the rest will follow. The sun will never set on India"

In an age of information and explosive application of knowledge the partners are no longer the universities and the traditional research institutions but the private entrepreneurs and researchers, especially in the field of biotechnology and information technology, administration and management. In India the undergraduate colleges have long remained under the tutelage and serfdom of the universities in the name of affiliation an profited little from their bureaucratic and uninspiring guidance. Many gems of teachers and students at the college level have been prevented from ventilating their creativity in the form of science and social projects, seminars, research articles and innovative recommendations in the fields of science, politics, local government, college administration. Parroting the past knowledge and retention of it for immediate material success has become the order of the day. Any talk of innovative ideas ad suggestions is frowned upon by the self- styled Professors of knowledge. Ironically, very few universities in India claim to have original and creative ideas that are published in their research journals. In fact, how many of them have research journals at all and if they have any what could be said of their creativity at the fundamental level and at the applied level.?

As "CREATION" being the focus area of knowledge paradigm and this being no longer the province of any privileged institution, the undergraduate colleges who have reached academic excellence have a role to play in the field of knowledge creation and innovation Knowledge creation is sine qua non for the growth of a nation interested in competitive technologies and better governance and management. Herein lies the role of a college which, while excelling at transfer of skills and knowledge, has a vital role to play in generating new ideas, hypotheses and making new projects. If the holistic goal of the National Knowledge Commission in transforming India into a knowledge society is to be taken with a missionary zeal, it is imperative that an undergraduate college- which in, in fact, is a misnomer, be pressed into service for the explosion of young and vibrant ideas. The teachers and alumni of the undergraduate college are parents of futuristic society and the fund of ideas they nurture in their minds must be given a free play for their creative ventilation. A few recommendations of what could be done at the college level are given below for effective creation of knowledge, a focus area of National Knowledge Commission.

1. The NAAC accredited college teachers and their alumni should be given certain guided projects in science and humanities for which they are specially identified by the UGC or Knowledge Commission.

2. An undergraduate college, if capable, should be assisted in running a research journal in which articles may be published either in English language or any recognized national language and the journal should be open forum for any college teachers interested in that particular field of study.

3. It must be made compulsory for a teacher not only to reorient himself or herself toward the new areas in his subject but to undergo research to upgrade and up skill himself and herself. A periodic

registration and institutional revaluation and auditing of teachers would surely place them on a high pedestal of proficiency, efficiency and surcharged energy.

4. Let the knowledge commission take the leadership in encouraging **"THINK TANKS" "RESERCH TEACHER ASSOCIATIONS AMONG COLLEGES"** lest the college teachers waste away their energies and experience in unfruitful exercise of politics, apathy and pessimism.

5. As to the contribution of alumni in the creation of knowledge and ideas, they too shall be given due share in the publications of articles and in the making of their own favorite academic projects. Let no novel idea be untried, how stupid it might look, for lack of our imagination and contemporary confines of time that may not look beyond its need. After all, the fuels of young minds are purer than those that have been corrupted by uninspiring routine of curriculum.

6. Looks like a discordant note but it is not, and without which no proper finish or crescendo is given to my topic of knowledge creation to which the teacher is the father or the mother of creation. Let the knowledge commission or its wing UGC give a big pat the hordes of contract and unaided teachers who are few potential bombshells of creation and academic excellence but whose daily living does not match the life of a worker in an unorganized sector. Let the potentialities of creation, energy, intelligence and academic acumen of these young minds be taken care of without any apathy and insensitivity of either privileged teachers or the managements or authorities concerned. Let everyone bear in mind that we cannot carry on the labor of creation with the half-starved brethren of our teaching community and let us bear in mind that they have a rightful stake in the knowledge creation, of which they are an integral part.

With these few humble recommendations and suggestions I call upon the knowledge Commission and the UGC to prepare the academic ground and research ambience so that college teachers of all hues may bloom without any prejudice or favour to anybody however high or humble, and take the Higher Education to heights of excellence in teaching and research which is a surefire investment for Future India. On this auspicious occasion let me dedicate this very humble paper to the unaided and contract teachers of college whose lives are of pitiable nature for lack of social and institutional support.

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A SURVEY ON HEART DISEASE PREDICTION USING DATA MINING TECHNIQUES

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Abstract

In healthcare industry, data mining plays a vital role for predicting diseases. These large amounts of data are very important in the field of Data Mining to mine useful information and generate relationships with the attributes. Heart disease prediction system can help health professionals in predicting heart disease status based on the medical data of the patient. Data mining offers the methodology and technology to change these loads of data into helpful information for decision making. This paper intends to give a survey of current techniques of knowledge discovery in databases via data mining techniques in heart disease prediction.

Keywords: Data Mining, Heart Disease, Risk Factors, Prediction, Accuracy.

INTRODUCTION

Data mining is used successfully and extensively in healthcare today. Data mining is the analysis of large data sets to discover patterns and use those patterns to forecast or predict the likelihood of future events. Usually, the mined information is represented as a model of the semantic structure of the dataset. It may be probable to employ the model in the prediction and classification of new data [3]. Healthcare providers use data mining and data analysis to find best practices and the most effective

treatments. These tools compare symptoms, causes, treatments and negative effects and

then proceed to analyze which action will prove most effective for a group of patients. This is also a way for providers to develop the best standards of care and clinical best practices [4].

HEART DISEASES

Heart is an important organ of all living creature, which plays a vital role of pumping blood to the rest of the organs through the blood vessels of the circulatory system. Heart Diseases describe a range of conditions that affect the heart and stand as a leading cause of death all over the world. Together, heart disease and stroke are most widespread and costly health problems facing the nation today. The heart has four valves — the aortic, mitral, pulmonary and tricuspid valves — that open and close to direct blood flow through your heart. Valves may be damaged by a variety of conditions leading to narrowing, leaking (regurgitation or insufficiency) or improper closing [1].

Although heart disease is sometimes thought of as a "man's disease," around the same number of women and men die each year of heart disease in the United States. Following a heart attack, approximately 1 in 4 women will die within the first year, compared to 1 in 5 men. Some conditions and lifestyle choices increase a person's chance for heart disease, including diabetes, overweight and obesity, poor diet, physical inactivity, and excessive alcohol use [2].

High blood pressure, high LDL cholesterol, and smoking are key risk factors for heart disease. Lowering your blood pressure and cholesterol and not smoking will reduce your chances for heart disease [2]. Nowadays, in the world Heart disease is the major cause of deaths. The World Health Organization (WHO) has estimated that of the 30 million hearts Patient in India, 14 million reside in urban areas and 16 million in rural areas.

Some of the risk factors for heart disease are

1. Smoking: Smokers risk a heart attack twice as much as non-smokers.
2. Cholesterol: A diet low in cholesterol and saturated Transfat will help lower cholesterol Levels and reduce the risk of heart disease.
3. Blood pressure: High BP leads to heart Attack
4. Diabetes: Diabetes if not controlled can lead to significant heart damage including heart attack and death.
5. Sedentary life style: Simple leisure time activities like gardening and walking can lower our risk of heart disease.
6. Eating Habits: Heart healthy diet, low in salt, saturated fat, Transfat, cholesterol and refined sugars will lower our chances of getting heart disease.
7. Stress: Poorly controlled stress and danger can lead to heart attacks and strokes.

HEART DISEASE PREDICTION

Data mining techniques are used for variety of applications. In health care industry, data mining plays a significant role for predicting diseases. For identifying a disease, number of tests should be essential from the patient. But using data mining technique the number of test should be condensed. This reduced test plays an important role in time and accuracy. This research paper analyzes how data mining techniques are used for predicting different types of diseases. This paper intends to provide a survey of data mining techniques in heart disease prediction.

SURVEY ON DATA MINING TECHNIQUES

Nidhi Bhatla,Kiran Jyoti et al[5]., proposed fuzzy logic with Decision Tree and Naïve Bayes, the performances of these techniques are to predict more accurately the presence of heart disease with reduced number of attributes. In this observation six attributes are reduced to four attributes, its help to reduce the test to be taken by the Patients.

Indira S.Fal Dessai et al [6]., proposed technique for Intelligent heart disease prediction system. In this research work, a Probabilistic Neural Network is used. It is gives better accuracy 92.10% when compared to other classification methods.

M.Akhil Jabbar, Dr.B.L.Deekshatulu and Dr.Priti Chandra et al[7]., applied Principal Component Analysis in Lazy Associative Classification to generate class association rules, it will be used to predict occurrence of Heart Disease. It gives 90% of accuracy and stated as males are affected more than women.

Purushottam, Prof (Dr) Kanak saxena and Richa Sharma et al[8]., KEEL (Knowledge Extraction based on Evolutionary Learning) tool is an open source Java software tool to assess evolutionary algorithms for Data Mining problems. It predicts that the system has great potential in predicting the risk level of heart diseases at more accurately

S.Suganya and P.Tamije Selvy et al [9]., presented the classification algorithms. They are J48, Bayes Net, Naïve Bayes and Simple Cart algorithms and proposed a REPTREE algorithm to reduce the death rate of people without any awareness and to predict higher accuracy and produce the results that patterns significant to the heart attack prediction are extracted.

Durairaj.M and Revathi.V et al[10]., In this paper Multilayer Perceptorn Back Propagation Algorithm is proposed and it is implemented in MATLAB 7.0. MLPA algorithm is best when compared

to other algorithms and it uses TRAINBR function, gives 96.30% of highest accuracy when compared to all other Training function of Feed Forward Back Propagation algorithm. This paper shows that MLAP can be efficient tool to predict Heart Disease with better accuracy.

In 2014 Aswathy Wilson, Gloria Wilson, Likhiya Joy.K implemented Weighted Associative Classifier WAC and K Means [11]. These techniques can be used with cross industry standard process for data mining (CRISP-DM) methodology is used to improve the classification performance and efficiency of data recovery. After the evaluation, K-Means had better accuracy when compared to weighted association classifier.

Ankur Makwana and Jaymin Patel et. al.[12], proposed the merge of Naive Bayes and Genetic Algorithm. After applying the rules, the analyzer compared with Genetic Algorithm, Naive Bayes Classifier, Decision trees algorithm, Logistic Model Tree Algorithm based on sensitivity, specificity, and accuracy. In this study, the result shows higher accuracy compared to other Data Mining techniques.

Jyoti Soni, Uzma Ansari, Dipesh Sharma and Sunita Soni et.al [13], in this paper Weighted Associative Classifier (WAC) methodology is to be used prediction of accuracy, support and Confidence. It gives 81.51 % accuracy, 25% Support, 80% of Confidence and GUI has to design to predict the heart disease according to rule base.

Yosawin Kangwanariyakul , Chanin Nantasenamat , Tanawut Tantimongcolwat and Thanakorn Naenna et. al[14], proposed three algorithms of neural network and three kernels of support vector machine for prediction of Ischemic heart disease. The outcome shows that back-propagation neural network and Bayesian neural network gave the highest classification accuracy of 78.43 %, while RBF kernel SVM gave the lowest classification accuracy of 60.78%.

Carlos Ordonez et al[15] proposed association rules to predict the degree of narrowing in four arteries based on heart perfusion measurements and risk factors. Four conditions were estimated in this work to reduce the number of rules: item filtering, attribute grouping, maximum item set size, and antecedent/consequent rule filtering. They were used to train and test approach with association rule to predict risk factors and the degree of disease in one artery.

In 2007 Latha Parthiban and R.Subramanian proposed new method that Coactive Neuro-fuzzy inference system (CANFIS)[16]. It is used to identify a nonlinear relationship and mapping between the different attributes. It used to calculate classification accuracy and training performances and it shows 0.000842 mean square error is only.

Sellappan Palaniappan and Rafiah Awang et al[17] developed Intelligent Heart Disease Prediction System (IHDPS) using three data mining techniques that Decision Trees, Naïve Bayes and Neural Network. It shows Neural Network gives the highest percentage of correct predictions (49.34%) followed by Naïve Bayes (47.58%) and Decision Trees (41.85%). If the entire population is processed, Naïve Bayes model appears to perform better than the other two as it gives the highest number of correct predictions (86.12%) followed by Neural Network (85.68%) and Decision Trees (80.4%). 909 records with 15 medical attributes

Shantakumar B.Patil and Dr.Ys.S.Kumaraswamy et. Al[18] proposed an efficient approach to extract significant patterns from the heart disease datasets for heart disease prediction using MAFIA algorithm. Based on the calculated significant weightage, the frequent patterns having value greater than a predefined threshold were chosen for the valuable prediction of heart attack.

CONCULSION

This survey paper provides the information on various data mining techniques that can be used for the identification and prevention of heart disease. The study shows that data mining techniques used with different type of attributes. Those techniques are compared on basis of accuracy. The objective of each technique is to predict higher accuracy of heart disease.

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KINETICS AND MECHANISM OF OXIDATION OF ASCORBIC ACID BY MANGANESE (VII) IN ACIDIC MEDIUM

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Abstract

The kinetic study of oxidation of ascorbic acid (AH_2) by manganese (VII) has been performed in acidic medium by spectrophotometrically λ_{max}550nm. The reaction shows a first order dependence in both ascorbic acid (AH_2) and Mn(VII). The order with respect to hydrogen ion has been found to be inverse first order. The reaction rate increases with increase in ionic strength. The value of energy of activation, enthalpy of activation and entropy of activation have been computed as 55.5 kJ $mole^{-1}$, 53.0 kJ $mole^{-1}$ and –45.31 JK^{-1} $mole^{-1}$, respectively. A mechanism consistent with the experimental data has also been purposed.

Keywords:Kinetics, Mechanism, Oxidation, Ascorbic Acid, Manganese (VII)

1. Introduction:

Ascorbic acid (Vitamin-C) exhibits a strong reducing tendency in aqueous solution (Berka,Vulterin & Zyka, 1965). The oxidation of ascorbic acid with molecular oxygen was reported (Khan & Martell, 1967). The electron transfer reaction between ascorbic acid and a number of metal ion *viz.*Pt (III) (Mehrotra, Agarwal & Mushran, 1970), V (IV)

(Zhang, 2002), Se (IV) (Tripathi & Mehrotra, 2002), Ru (III) (Tripathi & Mehrotra, 2003), Ce (IV) (Tripathi & Mehrotra, 2003) and Mo(VI) (Tripathi & Mehrotra, 2004), respectively were investigated.

2. Literature Review:

Manganese exhibits the widest range of oxidation states *viz* II, III, IV, V, VI and VII, respectively, in aqueous media. All above of the Mn(II) are powerful oxidising agents. The electrode potential of Mn(VII) and Mn(II) is +1.51 V and –1.18 V, respectively, at unit hydrogen ion concentration (Sharpe, 1984). The oxidation of oxalic acid by permanganate catalized by Mn(II), which occurs by successive stepwise reaction with catalyst participation (Taube, 1948). Oxidation of ethanol by permanganate at 400 nm studied (Kreingold, Kefilyn & Antolov, 1977). The bidentate cordinated complexes of mangeanese (II) with ascorbate ion were reported (Kaungo,1990). The present work deals with the kinetics of oxidation of ascorbic acid by manganese (VII) in acidic medium under varied condition of concentration of manganese (VII), ascorbic acid, hydrogen ion and ionic strength at different temperatures. A suitable mechanism in consistent with the experimental data has also been postulated for the reaction.

3. Methodology:

An aqueous solution of ascorbic acid (S.Merck) was prepared daily by dissolving its known amount in double distilled water in a Borosil glass flask. The solution of potassium permanganate (Qualigen's) was prepared by directly weighing of the sample and dissolving it in double distilled water containing a known amount of sulphuric acid. The solutions of known concentration of potassium chloride

(Qualigen's) and potassium sulphate(Qualigen's) were prepared in double distilled water.

Kinetic Procedure

The kinetics of the oxidation of ascorbic acid was studied under the verified Beer's law range for manganese (VII) concentration at λ_{max}550nm. The total volume of the reaction mixture in each case was kept 50ml. An aliquot of 5 ml of the reaction mixture was withdrawn at known time intervals and its optical density was measured in order to follow the progress of the reaction spectrophotometrically, using a ELICO-Digital Spectrophotometer model CL – 27. The concentration of the various components are recorded in the relevant tables. The experiments were performed in the temperature range of 20^0 – 41^0C in each case.

Stoichiometry

The stoichiometry of the reaction between ascorbic acid and manganese (VII) was obtained from several sets of experiments each containing known amounts of ascorbic acid and manganese (VII) in simple integral ratios with hydrogen ion concentration maintained at $16.0x10^{-3}$M and ionic strength $10.0x10^{-2}$ M KCl. The reaction mixture were allowed to stand for 8h at 20^0c in thermostated water bath. The stoichiometry, may be represented as follows :

$$5C_6H_8O_6 + 2[MnO_4]^- = 5C_6H_6O_6 + 2[MnO_4]^{6-} + 10\ H^+$$

Mn (VII) Mn (II)

4. Results and Discussion

Manganese (VII)

The experiments were examined with the variation of [Mn(VII)] between (7.5 – 15) x 10^{-4}M and the values of rate constants (k_1) are recorded in Table 1.

Table 1. Values of rate constants (k_1) at [AH_2] = 5.0 x 10^{-3}M, [H^+] = 16.0 x 10^{-3} M and

I = 10.0 x 10^{-2}M KCl

[Mn(VII)] x10^4M	k_1x10^2min^{-1}			
	20^0 C	27^o C	34^{o}C	41^o C
7.5	3.45	4.70	7.50	10.34
10.5	3.44	4.71	7.51	10.3

The above data shows that the reaction follows a first order dependence with respect to the oxidant, Mn (VII).

Ascorbic acid (AH_2) dependence

The experiments were performed with the variation of [AH_2] between (1.6–9.0) x 10^{-3}M. The values of rate constants k_1 and k_2 obtained are reported in Table 2.

Table 2. Values of rate constants (k_1 & k_2) at [Mn(VII)] = 12.5x 10^{-4}M,[H^+] = 16.0x10^{-3}M and [I] = 10.0x10^{-2}M KCl

[AH_2]x10^3M	k_1x10^2 min^{-1}				$k_2$$dm^3mol^{-1}$ min^{-1}			
	20^0C	27^0C	34^0C	41^0C	20^0C	27^0C	34^0C	41^0C
1.6	1.12	1.50	2.40	3.30	7.00	9.37	15.00	20.62
2.5	1.74	2.36	3.76	5.15	6.96	9.40	15.04	20.60
5.0	3.48	4.71	7.52	10.30	6.96	9.42	15.04	20.60
9.0	6.26	8.48	13.5	18.54	6.96	9.42	15.00	20.60

The above data indicate that the first order rate constant increase proportionately with increase in [AH_2], showing thereby a first order dependence in [AH_2]. The bimolecular rate constant (k_2) have also been calculated and the values obtained indicate that the total order of the reaction is two, being first order both in ascorbic acid and manganese(VII).

Hydrogen ion dependence

The effect of hydrogen ion concentration has been performed at the variation of [H^+] between (4.0–50.0)x10^{-3}M at [Mn(VII)]=12.5 x10^{-4}M, [AH_2] = 5.0 x 10^{-3}M and [I] = 10.0 x10^{-2} M KCl in the temperature range of 20^0 – 41^0C, showing that the reactions have an inverse first order dependence with respect to [H^+].

Temperature dependence

The effect of changing temperature was examined in the range 20^0-41^0C. The value of energy of activation (Ea) has been obtained from the slope of linear Arrhenius plot is 55.5 kJ mole $^{-1}$. The values of the various activation parameters, *viz*. frequency factor(A), entropy of activation (ΔS_a), enthalpy of activation (ΔH_a) were computed as 4.35×10^{10} dm^3 mole $^{-1}$sec^{-1},-45.31 JK^{-1} mole^{-1}and 53.0 kJ mole^{-1}, respectively.

Ionic strength dependence

The change in ionic strength by KCl and K_2SO_4 with the variation of concentration in the range of (2.0 – 20.0) x 10^{-2} M showed a positive salt effect on the values of the rate constants.

Discussion

The oxidation of ascorbic acid (AH_2) involves an overall two electron transfer, ascorbic acid being oxidized to dehydroascorbic acid (A). In general, oxidation of ascorbic acid takes place *via* the formation of ascorbate ion (AH^-) (Erdey, 1952) in a reversible fast step as follows:

$$AH_2 \underset{k_{-1}}{\overset{k_1}{\rightleftharpoons}} AH^- + H^+ \qquad \text{(fast)} \qquad \text{----------(1)}$$

The redox process involves interaction between ascorbate ion and Mn (VII). The reduction of Mn (VII) to Mn (II) may be considered as:

$$AH^- + [MnO_4]^- \xrightarrow{k_2} AH^\bullet + [MnO_4]^{2-} \qquad \text{(slow)} \qquad \text{---------- (2)}$$

$$AH^\bullet + [MnO_4]^{2-} \xrightarrow{k_3} A + [MnO_4]^{3-} \qquad \text{(fast)} \qquad \text{---------- (3)}$$

$$AH^{-} + [MnO_4]^{3-} \xrightarrow{k_4} AH^{\bullet} + [MnO_4]^{4-} \quad \text{(slow)} \quad \text{--------- (4)}$$

$$AH^{\bullet} + [MnO_4]^{4-} \xrightarrow{k_5} A + [MnO_4]^{5-} \quad \text{(fast)} \quad \text{-------- (5)}$$

$$AH^{-} + [MnO_4]^{5-} \xrightarrow{k_6} AH^{\bullet} + [MnO_4]^{6-} \quad \text{(slow)} \quad \text{--------- (6)}$$

$$AH^{\bullet} + [MnO_4]^{5-} \xrightarrow{k_7} A + [MnO_4]^{6-} \quad \text{(fast)} \quad \text{--------- (7)}$$

Mn(V), Mn(III) are analogous to weakly bound less stable intermediates (Sharpe, 1984). The formation of free radical ($AH^{\bullet}$) was confirmed by test as reported earlier (Verma, Chandak & Nand, 1989).

Establishing the differential equation for consumption of Mn(VII), we get:

$$\frac{d[MnO_4^-]}{dt} = k_2[AH^-][MnO_4^-] \qquad \text{----------(8)}$$

Applying the steady state treatment with respect to $[AH^-]$, we get:

$$\frac{d[AH^-]}{dt} = k_1[AH_2] - k_{-1}[AH^-][H^+] - k_2[AH^-][MnO_4^-] - k_4[AH^-][MnO_4]^{3-} - k_6[AH^-][MnO_4]^{5-} = 0$$

Or,

$$[AH^-] = \frac{k_1[AH_2]}{k_{-1}[H^+] + k_2[MnO_4^-] + k_4[MnO_4]^{3-} + k_6[MnO_4]^{5-}} \qquad \text{----------(9)}$$

Now, substituting the value of $[AH^-]$ from equation-9 to equation –8, we obtain:

$$\frac{d[MnO_4^-]}{dt} = \frac{k_1[AH_2][MnO_4^-]}{k_{-1}[H^+] + k_2[MnO_4^-] + k_4[MnO_4]^{3-} + k_6[MnO_4]^{5-}} \qquad \text{-----(10)}$$

As step –2, 4, 6, respectively, are slow and rate controlling only, so $k_{-1} >> k_2, k_4, k_6$ respectively and hence for large hydrogen ion concentration it may be assumed that $k_{-1}[H^+] >> k_2 [MnO_4^-]$, $k_4 [MnO_4^-]^3$, $k_6 [MnO_4^-]^5$, respectively. Thus the overall rate low equation –10 may be transformed to:

$$\frac{d[MnO_4^-]}{dt} = \frac{k_1 k_2 [AH_2][MnO_4^-]}{k_{-1}[H^+]} \quad \text{-----(11)}$$

The rate law equation –11, so obtained.

5. Conclusion

A first order dependence in ascorbic acid and manganese(VII) and an inverse first order dependence in respect to the hydrogen ion concentration, which is in agreement with the observed experimental results. The values of frequency factor (A) and entropy of activation (ΔS_a) were obtained as 4.35×10^{10} dm^3 $mole^{-1}sec^{-1}$ and -45.31 JK^{-1} $mole^{-1}$, respectively, which also support the involvement of two similarly charged ionic species in the rate determining step. Moreover, the addition of neutral salts like, potassium chloride or potassium sulphate increases the rate of oxidation and shows a positive salt effect. Which support the fact that two similarly charged ions are involved in the rate determining step of the mechanism formulated for the oxidation of ascorbic acid by Mn(VII).

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