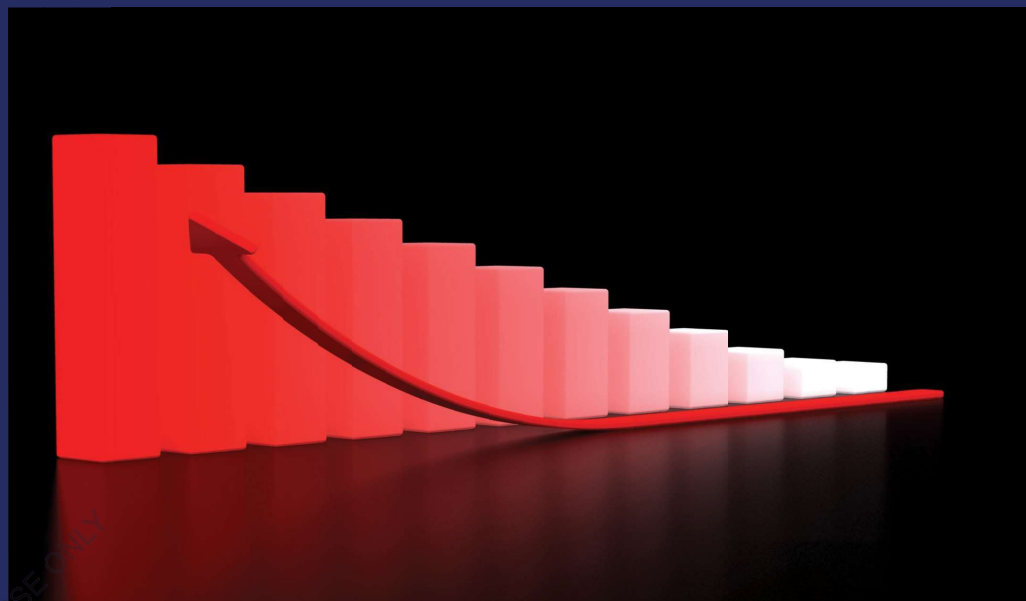


Most of the real life problems exhibit properties of multi-objectivity and fuzziness in nature. The book entitled "AN ALGORITHMIC APPROACH TO FUZZY LINEAR AND COMPLEMENTARITY PROBLEMS" analyses multi-objective optimization, linear complementarity and quadratic programming problems in fuzzy environment and it comprises six chapters. Certain fundamental concepts, definitions of fuzzy set theory and linear complementarity theory related to the book are provided in Chapter 1. Different Solution methodologies for solving multi-objective fuzzy linear programming problems with interval number coefficients are provided in Chapters 2 and 3. Chapter 4 formulates linear complementarity problems and parametric linear complementarity problems with fuzzy numbers. Further, algorithms have been developed to solve them. Chapter 5 presents a Taylor series approach to solve multi-objective fuzzy quadratic programming problems. Chapter 6 confers new algorithms for solving fuzzy quadratic programming problems. Finally in each chapter, to reinforce the ideas described and to reveal the validity of the proposed methods, numerical examples are given together with the outputs through the software MATLAB 7.0.



Irene Hepzibah
Nagoor Gani



Irene Hepzibah - Assistant Professor of Mathematics at T.B.M.L.College, Porayar affiliated to Bharathidasan University, Tiruchirappalli, Tamilnadu, India. Has 23 years of teaching experience. Has published 80 research papers at national and international level. Is serving as Editorial Board member & Reviewer in many International Journals.

An Algorithmic Approach to Fuzzy Linear and Complementarity Problems



Hepzibah, Gani

LAP LAMBERT
Academic Publishing

Imprint

Any brand names and product names mentioned in this book are subject to trademark, brand or patent protection and are trademarks or registered trademarks of their respective holders. The use of brand names, product names, common names, trade names, product descriptions etc. even without a particular marking in this work is in no way to be construed to mean that such names may be regarded as unrestricted in respect of trademark and brand protection legislation and could thus be used by anyone.

Cover image: www.ingimage.com

Publisher:

LAP LAMBERT Academic Publishing

is a trademark of

International Book Market Service Ltd., member of OmniScriptum Publishing Group

17 Meldrum Street, Beau Bassin 71504, Mauritius

Printed at: see last page

ISBN: 978-620-3-19774-7

Copyright © Irene Hepzibah, Nagoor Gani

Copyright © 2021 International Book Market Service Ltd., member of OmniScriptum Publishing Group

FOR AUTHOR USE ONLY



ICOPAM - 2022

INTERNATIONAL CONFERENCE ON PURE AND APPLIED MATHEMATICS

24th & 25th March 2022
(VIRTUAL)



Organised by

PG & RESEARCH DEPARTMENT OF MATHEMATICS
T.B.M.L COLLEGE, PORAYAR – 609 307,
TAMILNADU, INDIA
(Affiliated to Annamalai University, Chidambaram)

IN ASSOCIATION WITH
KERALA MATHEMATICAL ASSOCIATION



“Love Conquers All ”

ICOPAM-2022

INTERNATIONAL CONFERENCE ON
PURE AND APPLIED MATHEMATICS
(VIRTUAL)

IN ASSOCIATION WITH
KERALA MATHEMATICAL ASSOCIATION

24th and 25th MARCH, 2022

Organized by

PG & RESEARCH DEPARTMENT OF MATHEMATICS
TRAQUEBAR BISHOP MANIKAM LUTHERAN COLLEGE(TELC)
PORAYAR-609307, MAYILADUTHURAI DT,
TAMIL NADU, SOUTH INDIA.

Title of the book : INTERNATIONAL CONFERENCE ON PURE AND APPLIED
MATHEMATICS

Chief Editor : Dr. R. ANGELINE SARGUNA GIFTA
: Dr. THANGARAJ BEAULA
: Dr. J. JOSELINE MANORA

Organized by : PG & RESEARCH DEPARTMENT OF MATHEMATICS,
T.B.M.L COLLEGE,
PORAIYAR-609 307
TAMIL NADU.

First Edition : 2023

Pages : XXVI + 31

ISBN : 978-93-90188-84-0

Published : ESN PUBLICATIONS,
3/151-A, Muthuramalingapuram,
Kalloorani Post,
Virudhunagar District,
Tamilnadu,
India, Pincode-626105

© Department of Mathematics, 2023. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any other information storage and retrieved system, without prior permission in writing from the publishers.

The Editors and publishers are not responsible for the statements/opinions expressed by the author(s) of the published articles.

TELC



TRANQUEBAR BISHOP MANIKAM LUTHERAN COLLEGE

(Affiliated to Annamalai University, Chidambaram)

Porayar – 609307, Mayiladuthurai District, Tamilnadu.

Web: www.tbmlcollege.ac.in

Fax: (04364) 289592

e-mail: tbmlcollege@gmail.com

Dr. GENE GEORGE, M.Sc., M.Phil., Ph.D.,

Date: 24.03.2022

Principal



MESSAGE

I am very much elated to be engaged as a part of the “International Conference on Pure and Applied Mathematics” (ICOPAM) being organised by the PG and Research Department of Mathematics, T.B.M.L College, Porayar on 24.03.2022 & 25.03.2022.

Mathematics is a powerful tool for global scientific understanding and provides an effective way for building mental discipline. It plays a critical role in all aspects of life and it also helps in analytical thinking.

I express my ardent wishes to the Department of Mathematics for its strenuous efforts in releasing the souvenir as the International Conference is a great landmark and an achievement in the annals of historical and intellectual arena of the college. I hope that this conference will be a great initiative in kindling the young researchers to contribute a lot in the expansion of Mathematical vista.

With Best Wishes

Principal

TELC



TRANQUEBAR BISHOP MANIKAM LUTHERAN COLLEGE

(Affiliated to Annamalai University, Chidambaram)

Porayar – 609307, Mayiladuthurai District, Tamilnadu.

Web: www.tbmlcollege.ac.in

Fax: (04364) 289592

e-mail: tbmlcollege@gmail.com

Dr. THANGARAJ BEAULA, M.Sc., M.Phil., Ph.D.,

Date: 24.03.2022

Head & Convener



MESSAGE

I am delighted to pen down my views about the “International Conference on Pure and Applied Mathematics”(ICOPAM) on 24.03.22& 25.03.2022 as it is the maiden attempt of organising an International Conference by our Department.

The main objective of the conference is to create intellectual space for presentation of current research papers in the field of Mathematics. It provides a platform for eminent academicians, researchers and research scholars to exchange ideas, to discuss new advances, findings in the field of Mathematics. We are glad to inform that the papers presented are published in UGC Care, Web of Science and Scopus Indexed Journals.

As the Head of the Department and Convener of the Conference, I acknowledge the hard work all persons involved in designing and organising the International Conference.

I extend my wishes and felicitate the excellent job executed by the Organising Secretary Dr.R.Angeline Sarguna Gifta, the Department of Mathematics. I wish all participants – Guest Speakers, Paper Presenters, Researchers and Students good luck and pray God Almighty to bless their sincere attempt and accomplishment.

With Best Wishes

Dr. Thangaraj Beaula
Head & Convener

TELC



TRANQUEBAR BISHOP MANIKAM LUTHERAN COLLEGE

(Affiliated to Annamalai University, Chidambaram)

Porayar – 609307, Mayiladuthurai District, Tamilnadu.

Web: www.tbmlcollege.ac.in

Fax: (04364) 289592

e-mail: tbmlcollege@gmail.com

Dr.R.ANGELINE SARGUNA GIFTA, M.Sc., M.Ed., M.Phil., Ph.D.,
Assistant Professor & Organising Secretary

Date: 24.03.2022



MESSAGE

With all humility, I bow and thank Lord God Almighty, for giving me this opportunity to Organise International Conference on Pure and Applied Mathematics-ICOPAM 2022 on 24th and 25th March 2022 at T.B.M.L College, Porayar.

As the Queen of Science, Mathematics promotes intellectual knowledge in all fields of life which includes Physical Science, Natural Science, Engineering, Medicine, Finance, Computer Science, Statistics and so on. Mathematics is a systematic and symbolic representation of nature and mental calibration. Higher Mathematics at research level is the ladder for advanced thinking in inventions and discoveries which paves the way for great developments in the fields of Science and Technology.

Conferences open the windows for researchers to bring out their own concepts and ideas to achieve their intellectual ability courageously which will initiate and enable the students to perform their activities successfully in future.

As the Organising Secretary, I hereby render my heartfelt thanks to the Management, and Principal of our College for permitting me to organise this Conference. I also record my sincere thanks to all the Guest Speakers, Head of the Department, Members of the Staff of the Department, Guides, Research Scholars, Students, Participants and Volunteers for their encouragement, cooperation, support, and hard work to make this International Conference a grand success.

I am sure this Conference intellectually stimulates all the researchers and academicians.

With Best Wishes

Dr.R.Angeline Sarguna Giftha
Organising Secretary

COLLEGE PROFILE

MOTTO: Amor Vincit Omnia“ (LOVE CONQUERS ALL) ”

VISION:

A Brave New World we seek to create through provision of quality education reflecting Christian values with emphasis on character building, gender justice, rural empowerment and service to the marginalized.

MISSION:

1. Academic excellence through provision of quality infra-structure.
2. Imparting knowledge, skills and values for adapting to the changing socio-economic scenario.
3. Developments of personality of students vide meaningful co-curricular and extracurricular programmes.
4. Interface with community through extension activities

Tranquebar Bishop Manikam Lutheran College (TELC)- recent Offshoot of the Teaching Ministry of the First Protestant missionary Ziegenbalg who started the first formal school for Boys and Girls in India in 1707 in erstwhile Danish Colony, Tranquebar was inaugurated in 1972 at Porayar, the Head Quarters of Tranquebar, Taluk of Mayiladuthurai District, Tamilnadu, South India.

Established and administered by the Tamil Evangelical Lutheran Church (TELC) near Tranquebar, The Queen of Coramendal Coast -TBML college is the only Government Aided Christian College in this Region which caters to the intellectual and moral needs of aspiring first generation learners of this God-forsaken, backward, rural corner of Tamilnadu, populated mostly with Dalits, Fisherfolks and other most backward Communities.

In 1972 Porayar Town Panchyat had only a handful of graduates who were also migrated to bigger cities. With advent of TBML College, Renaissances emerged in this region resulting in producing many graduates and Post-Graduates in every household who sing the glory of this College around the world.

Though Inaugurated as a PUC College in 1972, today TBML College proudly boasts of providing as many as 14 Disciplines of UG courses,12 PG courses, 8 M.Phil and 7 Ph.D Research Courses-Both in Day and Evening Sessions. Of the 70 Day Session Teaching Staff, most are Doctorates and all others with M.Phil. are researching for their Ph.D.

COURSES OFFERED

1. Undergraduate Programmes:

B.A: English & History

B.Litt: Tamil

B.Sc: (Physics, Chemistry, Mathematics, Zoology, Computer Science, Bio-Chemistry).

B.C.A

Commerce: B.Com. B.Com.,(Cooperation)

Management: B.B.A

2. Post -Graduate Programmes:

M.A: English & History

M.Sc: Chemistry, Physics, Mathematics, Zoology, Computer Science.

M.C.A

Commerce: M.Com, M.Com (Cooperation)

Management: M.B.A.

3. Research Programmes:

Master of Philosophy: English, History, Cooperation, Chemistry, Physics, Mathematics, Zoology, Commerce.

Doctor of Philosophy: History, Cooperation, Chemistry, Physics, Mathematics, Zoology Commerce.

Extra- Curricular & Co –Curricular Activities:

Games & Sports, National Cadet Corps (NCC), Youth Red Cross(YRC), National Service Scheme(NSS), Red Ribbon Club(RRC), College Choir, Oratorical Club, Quiz Club & Young Writers form.

DEPARTMENT PROFILE

The Department of Mathematics of T.B.M.L. College, Porayar, came into existence when the college was inaugurated in 1972 as Pre-University College affiliated to Madras University. Late in 1976 it bloomed as a Degree teaching Department and then in 1985 it matured as a Postgraduate Department. By this time the College became affiliated to Bharathidasan University, Trichy. In due course many of the faculty members upgraded themselves as M.Phil and Ph.D holders. The Department came to fruition as a Research Department producing M.Phil and Ph.D. holders. All the staff in the Department became Doctors of Philosophy who guided hundreds of researchers to obtain M.Phil Degrees and 53 earned their Doctorate Degrees. Now it stands tall like a University Department with high profile staff producing employable youths in all walks of life. From 2021 – 22 T.B.M.L College becomes affiliated to Annamalai University.

Besides making students intellectuals through committed teaching the Department organizes Outreach Programmes to improve standards of Mathematics in neighbouring Higher Secondary Schools and Orphanages. Periodic Seminars, webinars and conferences are conducted by the Department to inspire PG students and Research Scholars of other Colleges in Tamil Nadu and thereby remains vibrant always.

It has been the cherished goal of the Department to inculcate in students a desire to excel, to demonstrate originality and to develop the sense of responsibility to the society. Our Department strives hard to uphold the torch of advanced knowledge to enlighten younger India!

DEPARTMENT PROFILE

NAME	EXPERIENCE	SPECIALIZATION
Dr. THANGARAJ BEAULA Head & Associate Professor	36 YEARS	FUZZY FUNCTIONAL ANALYSIS, FUZZY TOPOLOGY



Dr.J.JOSELINE MANORA Associate Professor	35 YEARS	GRAPH THEORY
--	-----------------	---------------------



Dr.STEPHEN DINAGAR Associate Professor	35 YEARS	FUZZY OPTIMIZATION
--	-----------------	---------------------------



Dr. RAJAN Associate Professor	27 YEARS	FUZZY STOCHASTIC PROCESS, FUZZY ALGEBRA
---	-----------------	--



DEPARTMENT PROFILE

NAME	EXPERIENCE	SPECIALIZATION
Dr. LILLY ESTHER RANI Associate Professor	22 YEARS	FUZZY ANALYSIS



Dr. T. JEYARAJ Assistant Professor	20 YEARS	NUMERICAL ANALYSIS
--	-----------------	-------------------------------



Dr. R. ANGELINE SARGUNA GIFTA Assistant Professor	6 YEARS	FUZZY NORMED LINEAR SPACE
---	----------------	--------------------------------------



Dr. R. IRENE HEPZIBAH Assistant Professor	18 YEARS	FUZZY MATHEMATICS
---	-----------------	------------------------------



DEPARTMENT PROFILE

NAME	EXPERIENCE	SPECIALIZATION
Dr.S.CHRISTINAL GUNASEELI Assistant Professor	9 YEARS	FUZZY TOPOLOGY



Dr.P.JAYASINGH MANOHAR Assistant Professor	16 YEARS	OPERATIONS RESEARCH
--	-----------------	--------------------------------



Dr.M. MERLIN PRIYANGA Assistant Professor	4 YEARS	FUZZY SOFT NORMED LINEAR SPACE
---	----------------	---



Mr.S.VIGNESH Assistant Professor	6 YEARS	GRAPH THEORY
--	----------------	---------------------



ORGANISING COMMITTEE

Dr.Thangaraj Beaula, Head & Associate Professor.

Dr.Joseline Manora, Associate Professor

Dr.Stephen Dinagar , Associate Professor.

Dr.D.Rajan, Associate Professor.

Dr.D.Lilly Esthar Rani, Associate Professor.

Dr.T.Jeyaraj, Assistant Professor.

Dr.R.Angeline Sarguna Gifita, Assistant Professor

Dr.R.Irene Hepzibah, Assistant Professor.

Dr.S.Christinal Gunaseeli, Assistant Professor.

Dr.P.Jayasingh Manohar, Assistant Professor.

Dr.M.Merlin Priyanga, Assistant Professor.

Mr.S.Vignesh , Assistant Professor.

ADVISORY COMMITTEE:

Dr.Nirmala P.Ratchagar,

Dean, Faculty of Science, Professor of Mathematics,
Annamalai University, Chidambaram.

Dr.G.Thangaraj,

Professor & Head of Mathematics,
Thiruvalluvar University, Vellore.

Dr.T.Robinson,

Head & Associate Professor of Mathematics,
Madras Christian College, Chennai.

Dr.S.Meena,

Head & Associate Professor of Mathematics,
Government Arts College, C.Mutlur, Chidambaram.

Dr.V.Chinnathurai,

Professor of Mathematics,
Annamalai University, Chidambaram.

KEY NOTE SPEAKER

Dr.Sunny Kuriakose

Chief Administrator & Dean Research,
Mar Baselios Institute of Technology & Science,
Nellimattom, Ernakulam, Kerala.

RESOURCE PERSONS

TECHNICAL SESSION I

Dr.D. Gnanaraj Thomas

HOD of Mathematics,
Saveetha School of Engineering,
Poonamallee, Chennai

TECHNICAL SESSION II

Dr. Meenakshi Paramasivan

Professor of Mathematics,
University of Trier, Germany.

TECHNICAL SESSION III

Dr.A.Nagoor Gani

Associate Professor of Mathematics,
Jamal Mohamed College, Trichy.

TECHNICAL SESSION IV

Prof. Dr.Sonajharia Minz,

Vice-Chancellor,
Sido Kanhu Murmu University, Jharkhand
and
Professor and Former Dean,
School of Computer & Systems Sciences,
Jawaharlal Nehru University, New Delhi.

TBML COLLEGE, PORAYAR
PG & RESEARCH DEPARTMENT OF MATHEMATICS

TWO DAY INTERNATIONAL CONFERENCE ON
PURE AND APPLIED MATHEMATICS – ICOPAM 2022

DATE : 24.03.2022

DAY-1

TIME :10.00 am TO 1.00 pm & 2.00 pm TO 5.00 pm

INAUGURAL SESSION

TIME:10.00 am to 10.45am

OPENING PRAYER

:Dr.S. Christinal Gunaseeli
Assistant Professor

WELCOME ADDRESS

:Dr.Thangaraj Beaula
Head & Convener

PRESIDENTIAL ADDRESS

:Dr.Gene George
Principal.

RELEASING CONFERENCE SOUVENIR:
INTRODUCTION OF THE SPEAKER

Principal & Head of the Department

:Dr. D. Rajan
Associate Professor

KEYNOTE ADDRESS

:Dr.Sunny Kuriakose
Chief Administrator and Dean Research,
Mar Baselios Institute of Tech. and Sci.,
Nellimattom, Ernakulam, Kerela.

VOTE OF THANKS

:Dr.R.Angeline Sarguna Gifita
Asst. Prof. & Organising Secretary

TECHINICAL SESSIONS

TECHNICAL SESSION I

TIME:10.45 am to 1.00 pm

INTRODUCTION OF THE SPEAKER

:Dr.D. Lilly Esthar Rani
Associate Professor

INVITED TALK

:Dr.D. Gnanaraj Thomas
HOD of Mathematics,
Saveetha School of Eng., Chennai

PAPER PRESENTATION-CHAIRPERSON

:Dr.D.Stephen Dinagar
Associate Professor

TECHNICAL SESSION II

TIME:2.00 pm to 5.00 pm

INTRODUCTION OF THE SPEAKER

:Dr.Thangaraj Beaula
Associate Professor & Head

INVITED TALK

:Dr. Meenakshi Paramasivan
Professor of Mathematics,
University of Trier, Germany

PAPER PRESENTATION-CHAIRPERSON

:Dr.J. Joseline Manora
Associate Professor

TBML COLLEGE, PORAYAR
PG & RESEARCH DEPARTMENT OF MATHEMATICS

TWO DAY INTERNATIONAL CONFERENCE ON
PURE AND APPLIED MATHEMATICS – ICOPAM 2022

DAY-2

DATE: 25.03.2022

TIME:10.00 am TO 1.00 pm & 2.00 pm TO 5.00 pm

OPENING PRAYER

: Dr.M.Merlin Priyanga

Assistant Professor

TECHINICAL SESSIONS

TECHNICAL SESSION III

TIME:10.00 am to 1.00 pm

INTRODUCTION OF THE SPEAKER

:Dr.D.Stephen Dinagar

Associate Professor.

INVITED TALK

: Dr.A.Nagoor Gani

Associate Professor of Mathematics,
Jamal Mohamed College, Trichy

PAPER PRESENTATION-CHAIRPERSON

:Dr.Thangaraj Beula

Head & Associate Professor

TECHNICAL SESSION IV

TIME:2.00 pm to 5.00 pm

INTRODUCTION OF THE SPEAKER

:Dr.J.Joseline Manora

Associate Professor

INVITED TALK

:Dr.Sonajharia Minz

Vice Chancellor,
Sido Kanhu Murmu University,
Jharkhand

PAPER PRESENTATION-CHAIRPERSON

:Dr.D.Rajan

Associate Professor.

VALEDICTORY FUNCTION

PRAYER

:Dr.R.Irene Hepzibah

Assistant Professor

WELCOME ADDRESS

:Dr.D.Stephen Dinagar

Associate Professor.

VALEDICTORY ADDRESS

:Dr.Gene George

Principal

FELICITATION

:Dr.J.Joseline Manora

Associate Professor

FEEDBACK BY THE PARTICIPANTS

REPORT OF THE CONFERENCE

:Dr.R. Angeline Sarguna Gifta

Asst. Prof. & Organising Secretary

VOTE OF THANKS

:Dr.R. Angeline Sarguna Gifta

Asst. Prof. & Organising Secretary

Paper Presentation - I

Time : 11.30 am to 1.00 pm

Date : 24. 03. 2022

Chair Person : Dr. D. Stephen Dinagar

Duration : 5 Minutes per Paper

S. No	Name	College	Title	Remark
1	Dr. A. Nagoor Gani and R. Yogarani	Jamal Mohamed College, Trichy	A New Approach on Fuzzy l_1 Penalty Method Sparse Regulaization with Fuzzy Linear Programming Problem.	
2	Dr. A. Nagoor Gani, M. Affrose Begum and P. Muruganantham	Jamal Mohamed College, Trichy	An Application of Triangular Fuzzy Number Matrices with Triplet Operator in Medical Diagnosis.	
3	Dr. R. Irene Hepzibah and D. Leonita	T.B.M.L College, Porayar.	A Method to Evaluate the Evidence Dependability on the Stimulus of Neutrosophic Set.	
4	Dr. R. Irene Hepzibah, G. Ragasudha and R. Idamalarselvi	T.B.M.L College, Porayar.	A Mathematical Analysis of DSSC Parameters Estimation Using Fuzzy Sets Based on Organic Dyes 5 – Methyl Salicylidene and 5 – Nitho Salicylidene for Dye Sensitized Solar Cell using TiO_2 and V_2O_5 Compounds.	
5	M. Nandhini and R. Lavanya	CIT, Coimbatore	Sensitivity Analysis of the Covid -19 Model in Hospital Environment.	
6	NU. K. Shyni and Dr. R. Lavanya	CIT, Coimbatore	Modelling the Transmission Dynamics of Candida Ausis Infections Among Patients in Critical Care Facilities: Sensitivity Analysis and Numerical Investigations.	
7	Dr. R. Irene Hepzibah and	T.B.M.L College, Porayar.	On Solving Fully Fuzzy Neutrosophic	

	N. Sudha		Linear Complementarity Problem.	
8	Dr. S. Mallika	Dharmapuram Adhinam Arts College, Mayiladuthurai.	Max – Max Operation on a Upper Level Partition of Fuzzy Square Matrices.	
9	V. Vijaya and D. Rajalakshmi	SRC, Trichy	Finding Critical Path in a Fuzzy Project Network using Neutrosophic Fuzzy Number.	
10	V. Vijaya and D. Rajalakshmi	SRC, Trichy	Decision Making in Fuzzy Environment using Pythagorean Fuzzy Numbers.	
11	Dr. U. Hari Narayanan and K. Kumaresh	AVC College, Mayiladuthurai	A Note on Rank of Trapezoidal Fuzzy Number Matrices.	
12	Dr. R. Irene Hepzibah and M. Kavitha	T.B.M.L College, Porayar.	Intuitionistic Fuzzy Multi Criteria Analysis using Entropy with Topsis Method in School Education During Covid – 19 Pandemic.	
13	Dr. R. Vidhya and Dr. Irene Hepzibah	T.B.M.L College, Porayar.	A MATLAB Programming Approach for Operators on Single Value Triangle and Trapezoidal Neutrosophic Numbers.	
14	R. Murugesan and T. Esakkiammal	St. John’s College, Palayamkottai	Cassi – An Optimal Zeros Assignment Method for Solving Assignment Problems.	
15	A. Ashika Shereffin and S. Narmadha	Lady Doak College, Madurai.	Mathematical Analysis of a Tuberculosis Epidemic Model with Non – Linear Incidence Rate and Treatment.	
16	S. Eakambaram	Periyar Government Arts College,	Variance Estimation for the Regression and Ratio Estimators in Two Phase Sampling.	
17	S. R. Shreenitha, M. Subathra	Lady Doak College, Madurai.	Graph Theoretical Approacch on Constellation of Stars.	
18	Dr. R. Angeline Sarguna Gifta	T.B.M.L College, Porayar.	Fuzzy Norm And Best Approximation In a – Norm On Linear Space	
19	Dr. E. Lilly Esther Rani	T.B.M.L College, Porayar.	An Introduction to Paths on Fuzzy Controlled Grpahs.	

Paper Presentation - II

Time : 3 pm to 5 pm.

Date : 24.03.2022

Chair Person : Dr. J. Joseline Manora

Duration : 5 Minutes per Paper

S. No	Name	College	Title	Remark
1.	M. Sasikala and M. Kaliraja	H. H The Rajah's College, Pudukkottai	Even Intensity and Implementation of Fuzzy Intrinsic Edge – Magic Graphs	
2	Dr. S. P. Nandhini	The Standard Fireworks Rajaratnam College for Women, Sivakasi.	On Complement and Applications of Strongly Edge Irregular Fuzzy Graphs in Aadhaar Card and Various Debit and Credit Cards.	
3	A.B. Anisha and A. Priscilla Paul	Lady Doak College, Madurai.	Cover Edge Pebbling Number for Jahangir Graphs $J_{1,m}$, $J_{2,m}$, $J_{3,m}$, $J_{4,m}$ and $J_{5,m}$.	
4	Dr. S. Meena and G. Gajalakshmi	Government Arts and Science College, Chidambaram.	Odd Prime Labeling of Graphs Related to Circular Ladder.	
5	M. Subathra	Lady Doak College, Madurai.	Well – Coveredness of Line Graphs of Zero Divisor Graphs.	
6	S. Meena and S. Usharani	Government Arts College, Chidambaram.	Product Cordial Labelling for Some Bicyclic Graph.	
7	Dr. A. Nagoor Gani, V. Anusuya and N. Rajathi	Jamal Mohamed College, Trichy	Some Aspects on Fully Complete Domination in Picture Fuzzy Graphs based on Strong Edges.	
8	K. Jeya Daisy, R. Santrin Sabibha, P. Jeyanthi and Maged Z. Yousef.	Holy Cross College, Nagercoil.	K – Product Cordial Labeling of Path Graphs.	
9	Dr. Nagoor Gani, A. Nafunisha, and P. Muruganatham	Jamal Mohamed College, Trichy	The Middle Dominating Fuzzy Graph of a Fuzzy Graph.	

10	T. Aruna and S. P. Jeyakokila	Lady Doak College, Madurai.	Some Results on Rainbow Connection Number of Graph.	
11	S. P. Nandhini and A. Shaarudharshini	The Standard Fireworks Rajaratnam College for Women, Sivakasi.	Antimagic Labeling of Complete Graphs and its Application in Chessboard.	
12	D. Rajalakshmi and V. Vijaya	SRC, Trichy.	Irregular Bipolar Fuzzy Labeling Graph.	
13	Dr. T. Muthukani Vairavel and Dr. J. Joseline Manora	T.B.M.L College, Porayar.	Majority and Connected Majority Domination Edge Addition (Critical) Graphs	
14	Dr. J. Joseline Manora and R. Mekala	T.B.M.L College, Porayar.	Changing and Unchanging of Majority Dom – Chromatic Number When Adding an Edge.	
15	G. Chitra	Kalasalingam Academy of Research and Education, Krishnarkoil.	Primer Distance Anti – Magic Labeling and its Spectral Values on Some Special Graphs.	
16	D. Rajalakshmi and V. Vijaya	SRC, Trichy.	Complement in Fuzzy Labeling Graphs.	
17	A.Haritha, J. Chithra.	Lady Doak College, Madurai.	Some New Results on Paley Graphs.	
18	Dr. P.A. Shanthi	Srisairam Engineering College, Chennai.	The Effect of Edge Removal in Peterson Graphs.	
19	S. Sivagnanapriya, V. T. Chandrasekaran and G. Rajasekar	Jawahar Science College, Neyveli	Di – domination Pair of Simple Graphs.	

Paper Presentation - III

Time : 11 am to 1 pm

Date : 25. 03. 2022

Chair Person : Dr. Thangaraj Beaula

Duration : 5 Minutes per Paper

S. No	Name	College	Title	Remark
1	Dr. Thangaraj Beaula, R. Abirami	T.B.M.L College, Porayar.	Some Fixed Point Theorems in 2 – Fuzzy 2 – Hilbert Space	
2	S. Suriyakala	Mannar Thirumalai Naicker College, Madurai.	On Connectedness in Ideal Topological Spaces.	
3	Dr. A. Nagoor Gani, B. Shafina Banu and P. Muruganatham	Jamal Mohamed College, Trichy.	Fixed Point & Common Fixed Point Theorems on Fuzzy Semi – Norm	
4	A.Pappa, P. Muruganatham and A. Nagoor Gani	Jamal Mohamed College, Trichy.	A Note on Compatible Norm of Circulant Fuzzy Matrices.	
5	M. S. Srinivasan, R. Helen	Poompuhar College, Melaiyur.	On Bounds For Certain Closed Neighbourhood Topological Indices.	
6	P. Srividhya & T. Indira	SRC, Trichy.	On Nano Regular b – Closed Sets and Nano Regular b – Open sets in Nano Topological Spaces.	
7	Dr. S. Barkavi	C. Kandaswami Naidu College for Women, Cuddalore.	Fuzzy Soft Vector Space.	
8	R. H. Aravinth & R. Helen	Poompuhar College, Melaiyur.	Computation of Numerous Topological Indices of Dutch Windmill Graph D_n^m	
9	P. Lakshmi Kumari and V. Thiruvani	Saiva Bhanu Kshatriya College, Aruppukottai.	S – Topological Be – Algebras.	
10	Nirmala Rebecca Paul and R. Sangeetha	Lady Doak College, Madurai.	Identification of Efficacious Algorithm Via Rough Sets.	
11	S. Princiya and S. N. Leena Nelson	WCC, Nagercoil.	Fixed Point Theorems in Fuzzy 2 – Banach Space using E. A Property.	

12	E. L Hary Tency and Dr. Pauline Mary Helen	Nirmala College for Women, Coimbatore.	Vague of Functions in Vague Topological Spaces.	
13	Dr. D. Stephen Dinagar and M. Manvizhi	T. B. M. L. College, Porayar.	A Novel Approach to the Ranking of Generalized Quadrilateral Fuzzy Numbers.	
14	Dr. D. Stephen Dinagar and M. Manvizhi	T. B. M. L. College, Porayar.	Fuzzy Economic Inventory Model in Cloudy Fuzzy Environment.	
15	Dr. Thangaraj Beaula and S. Saravanan	T. B. M. L. College, Porayar.	Fuzzy Multi – Objective Assignment Problems using Diagonal Optimal Method.	
16	Dr. Thangaraj Beaula and L. Mohan	T. B. M. L. College, Porayar.	Strong and Weak Solution of Fuzzy Linear System of Equations.	
17	A.Arthi, Dr. K. Latha and Dr. K. Thiripurasundari.	Poompuhar College, Melaiyur	Some Special Functions Involving Type – 2 Triangular Mixed Fuzzy Numbers.	
18	M. Kaliraja and T. Bhavani	H.H. The Rajah's College, Padukkottai.	Interval Valued Secondary K – Range Symmetric Fuzzy Matrices.	
19	Dr. J . Jayasingh Manohar	T.B.M.L College, Porayar.	Fixed Point Theorem In Generalized Fuzzy Metric Spaces	

Paper Presentation - IV

Time : 3 pm to 5 pm

Date : 25. 03. 2022

Chair Person : Dr. D. Rajan

Duration : 5 Minutes per Paper

S. No	Name	College	Title	Remark
1	S. Sriram and A. David Christopher	National College, Trichy	Polynomial Representation of a Common Generalization of Ramanujan r Function and Unrestricted Partition Function.	
2	R. Kalyanaraman and G. Janani	Annamalai University, Chidambaram.	Finite Population Single Server Batch Service Queue with Compulsory Vacation.	
3	Dr. N. Paranjothi, Dr. L. Mohanapriya and C. Arivumani	Annamalai University, Chidambaram.	A Study of Queuing Models in Café.	
4	Dr. Thangaraj Beaula and R. Seetha	T.B.M.L College, Porayar	An analysis of Multi – Objective Fuzzy Stochastic Non – Linear Programming Models.	
5	Dr. R. Hema and Anitha alias and D. Ponnammal	Annamalai University, Chidambaram.	Picture Fuzzy Ideals in Gamma Semi Groups.	
6	M. Rajthilak, V. Sridhar and R. Irene Hepzibah	T.B.M.L College, Porayar.	Novel Level Shifted PWM Technique for unequal and Equal Power sharing in Ruasi Z Source cascaded Multi Level Inverter for PV Systems in Fuzzy Environment.	
7	S. Gayathri and G. Roni	SRC, Trichy	Analysis of Variance and Standard Deviation of FM/M/1/K Interdependent Stochastic Feedback Arrival Model with Finite Capacity and Single Server	
8	R. Kalyanaraman and Hellen	Annamalai University, Chidambaram.	M/M/2 Hetrogeneous Server Queue with Variant Breakdown and with Discouraged arrivals.	

9	R. Suguntha Kunthalambigai and Dr. D. Rajan	T.B.M.L College, Porayar.	On Forecasting Time Series Analysis under Fuzzy Environment.	
10	R. Suguntha Kunthalambigai and Dr. D. Rajan	T.B.M.L College, Porayar.	Annual Rainfall Forecasting under Fuzzy Logic Interval Based Partitioning in Different Intervals.	
11	Dr. R. Irene Hepzibah and D. Leonita	T.B.M.L College, Porayar.	An Evidential Model for Environmental Risk Assessment in banana Production Using Dempster Shafer Theory of Evidence.	
12	K. Lalitha, N. Bhuvaneshwari and T. Muthuraji	Annamalai University, Chidambaram.	Commutative Monoid and Monoid Homomorphism using Luka – Implication Operation over Fermatean Fuzzy Matrices.	
13	Dr. A. Nagoor Gani and T. Shiek Pareeth	Jamal Mohamed College, Trichy.	A Spreed of Minimum Vertex Cover of Optimization Matching Techniques in the Bipartite Graph for Solving w- Pentagonal Fuzzy Linear Sum Bottleneck Assignment Problems.	
14	Dr. R. Irene Hepzibah and S. Shilpa Ivin Emimal	T.B.M.L College, Porayar.	On Solving Neutrosophic Unconstrained Optimization Problems by Newton’s Method.	
15	B. Visali, Dr. K. Latha and Dr. K. Thiripurasundari	Poompuhar College, Melaiyur.	S – Bidiagonal Type – 2 Triangular Fuzzy Matrices.	
16	K. Ruth Isabel, G. Arul Freeda Vinodhini	Saveetha School of Engineering, Chennai.	Material Selection for Dental Implant – If VIKOR MCDM Technique.	
17	M. Kaliraja and T. Bhavani	H.H. The Rajesh’s College, Pudukkottai.	Interval Valued K – Kernal Symmetric Fuzzy Matrics.	
18	S. Sivagnanapriya, V. T. Chandrasekaran and G. Rajasekar.	Jawahar Science College, Neyveli	Di – domination Pair of Wheel and its Related Graphs.	
19	Dr. S. Christinal Gunaseeli	T.B.M. L College, Porayar.	On Comparison Of Fuzzy Transportation Problem With The Existing Method	
20	Dr. D. Rajan and Dr. C. Senthil Murugan	T.B.M.L College, Porayar.	Up and Down Shifted Proportional Fuzzy Stochastic Orderings by Using Exponential Triangular Fuzzy Random Variables.	

MEMBRANE COMPUTING AND NP- COMPLETE PROBLEMS

Dr. D. Gnanaraj Thomas
Professor, Department of Applied Mathematics,
Saveetha School of Engineering , Chennai
Former Associate Professor of Mathematics
Madras Christian College, Chennai, India
Email: gnanarajthomas@gmail.com



Abstract

Membrane Computing is a new computability technique, which is inspired from biochemistry. This new method of computation was proposed by Paun in 1998 and hence this system of computation is called as P System. A sequential rewriting P System (or simply rewriting P system) is a formal language-generating device. A variant of rewriting P system called replicated rewriting P system is capable of solving hard problems in linear time, with exponential space. In this talk, we review rewriting P systems and the associated formal languages. We show that the satisfiability (SAT) problem of propositional formulas in the conjunctive normal form and the Hamiltonian Path Problem (HPP) can be solved in linear time using replicated rewriting P systems. It should be noted that SAT and HPP problems are well-known NP-Complete problems.

References :

- ❖ C.Ferretti, G.Mauri, Gh.Paun, C.Zandron: On three variants of P systems with string-objects, *Theoretical Computer Sci.*, 301(2003), 201-215.
- ❖ S.N.Krishna, R.Rama: P systems with replicated rewriting. *J.Automata, Languages, Combinatorics*, 6(2001), 345-350.
- ❖ Gh.Paun : Computing with membranes, *Journal of Computer and System Sciences* 61(1), 108-143, 2000.
- ❖ Gh.Paun: *Membrane Computing: An Introduction*, Springer-Verlag, Berlin, 2002.

OPERATIONS ON ARRAYS

Dr. Meenakshi Paramasivan

**Professor of Mathematics
University of Trier
Germany**



Abstract

Automata theory is the study of abstract machines. It is a theory in theoretical computer science and discrete mathematics (a subject of study in mathematics and computer science). The word automata (the plural of automaton) comes from a Greek word which means “self-acting”. Automata theory is closely related to formal language theory. The theory of formal languages constitutes the backbone of the field of science now generally known as theoretical computer science.

This talk aims to introduce a few types of automata and grammar models and gives an overview on the class of languages recognized by them in the two-dimensional world. A two-dimensional string (or a picture) is a two-dimensional rectangular array of symbols taken from a finite alphabet. A two-dimensional language (or picture language) is a set of pictures.

TYPES OF GRAPHS IN UNCERTAIN ENVIRONMENT

A. NAGOOR GANI

Associate Professor of Mathematics,

P.G. & Research Department of Mathematics,

Jamal Mohamed College (Autonomous), Tiruchirappalli-620 020



ABSTRACT

In the paper, basic concept of fuzzy sets and fuzzy relation, Soft set, various types of graphs that is Hyper graph, fuzzy graph, fuzzy soft graph, fuzzy soft Hyper graph and related definitions are given with example. Also strong arc fuzzy graph, strong arc degree and strong arc neighborhood degree of a node in fuzzy graph are introduced. Also some basic concepts of dominations using fuzzy graph is discussed.

PARTICIPANT'S ABSTRACTS

SOME FIXED POINT THEOREMS IN 2-FUZZY 2-HILBERT SPACE

¹Thangaraj Beaula and ²R.Abirami

¹ Associate Professor, PG and Research Department of Mathematics, T.B.M.L. College,
(Affiliated to Bharathidasan University) Porayar-609307.

² Research Scholar, PG and Research Department of Mathematics, D.G.G.A. College(W),
(Affiliated to Bharathidasan University) Mayiladuthurai -609001.

¹edwinbeaula@yahoo.co.in; ²mithraa.abi@gmail.com

Abstract

In this paper, the concept of 2-fuzzy 2-Hilbert space is introduced and some fixed point theorems are developed.

ON COMPLEMENT AND APPLICATIONS OF STRONGLY EDGE IRREGULAR FUZZY GRAPHS IN AADHAAR CARD & VARIOUS DEBIT AND CREDITCARDS

S.P.Nandhini

Assistant Professor, Department of Mathematics,

The Standard Fireworks Rajaratnam College for Women, Sivakasi-626 123 (T.N.), India.

spnandhinimani@gmail.com

Abstract

In this paper, Characterization of Strongly Edge Irregular Fuzzy Graphs & Strongly Edge Totally Irregular Fuzzy Graph are studied and they are examined with its complement. Also discussed some applications of Strongly Edge Irregular Fuzzy Graphs in Aadhaar Cards & Various Debit and Credit Cards.

EVEN INTENSITY AND IMPLEMENTATION OF FUZZY INTRINSIC EDGE -MAGIC GRAPHS

¹M. Sasikala and ²M. Kaliraja

¹Assistant Professor, Department of Mathematics,

The American College, Madurai – 625 002.

²Assistant Professor, PG and Research Department of Mathematics

H.H. The Rajah's college (Autonomous), Affiliated to Bharathidasan University,

Pudukkottai – 622001

¹sasi.jose1985@gmail.com

²mkr.maths009@gmail.com

Abstract

A graph labelling is an assignment of integers to the vertices or edges, or both under certain restrictions. A fuzzy graph G is said to be intrinsic edge-magic if it satisfies the intrinsic edge-magic labelling with intrinsic constant $\lambda_c = \sigma(v_i) + \mu(v_i v_j) + \sigma(v_j)$ for all $v_i, v_j \in V$. In this manuscript, we introduce the even intensity of fuzzy intrinsic edge magic graph and the implementation of fuzzy intrinsic edge magic graph is illustrated with suitable example.

POLYNOMIAL REPRESENTATION OF A COMMON GENERALISATION OF RAMANUJAN r FUNCTION AND UNRESTRICTED PARTITION FUNCTION

¹S. Sriram and ²A. David Christopher

¹Assistant Professor, PG & Research Department of Mathematics
National College, (Affiliated to Bharathidasan University), India - 620 001.

²Research Scholar, PG & Research Department of Mathematics
National College, (Affiliated to Bharathidasan University), India - 620 001.

¹sriram.priya02@yahoo.com; ²davidchristopher@americancollege.edu.in

Abstract

For real k , the generalized Ramanujan's tau function, denoted $r_k(n)$, is defined by $q \prod_{m=1}^{\infty} (1 - q^m)^k = \sum_{n=1}^{\infty} r_k(n) q^n$. We will show that: for a fixed positive integer n , the function $r_k(n)$ is a polynomial in k of degree $n - 1$ with its coefficients involving sum-of-divisors function. This polynomial representation permits us to obtain new congruence relations involving $r_k(n)$. Moreover, criterions were obtained to ascertain nonvanishing nature of $r_k(n)$ for some specific integer values of k .

FINITE POPULATION SINGLE SERVER BATCH SERVICE QUEUE WITH COMPULSORY VACATION

¹R. Kalyanaraman and ²G. Janani

Department of Mathematics, Annamalai University, Annamalainagar-608002, India

¹r.kalyan24@rediff.com; ²jananiganesan8619@gmail.com.

Abstract

We consider a finite population single server queue where the arrival process is process poisson and service time distribution is negative exponential. The services are given in batches of fixed size and after each service completion, the server takes vacation whose duration is also negative exponential distribution. We compute the system size probabilities and some performance measures. By taking particular values to the parameter we presents the corresponding a numerical models.

A NEW APPROACH ON FUZZY P_1 PENALTY METHOD SPARSE REGULARIZATION WITH FUZZY LINEAR PROGRAMMING PROBLEM

¹A.Nagoor Gani and ²R. Yogarani

¹Associate professor and ²Research scholar

Research Department of Mathematics

Research Department of Mathematics, Jamal Mohamed College (Autonomous),
(Affiliated to Bharathidasan University), Tiruchirappalli-620 020, India

¹ganijmc@yahoo.co.in, ²yogaranimaths@gmail.com²

Abstract

This article highlights a new technique of the fuzzy regularization least square with a nonconvex, non smooth of the fuzzy Huber function to solve the ill-posed fuzzy linear programming problem. Further, we focus on the fuzzy existence and stability of the fuzzy sparse regularization solution. In this method, a fuzzy P_1 penalty function algorithm is utilised to find the solution to a given problem. This work, in particular, focuses on applying an algorithmic strategy to solve fuzzy numerical problems.

ON CONNECTEDNESS IN IDEAL TOPOLOGICAL SPACES

S. Suriyakala

Department of Mathematics, Mannar Thirumalai Naicker College, Madurai - 625 004, India.
suriyakalaks@gmail.com

Abstract

The notion of ideals in topological spaces and the concept of ideal topological spaces are available in the literature. In this paper the topological concept of connectedness in the context of ideal topological spaces is discussed.

FIXED POINT & COMMON FIXED POINT THEOREMS ON FUZZY SEMI-NORM

¹A.Nagoor Gani, ²B.Shafina Banu and ³P.Muruganantham

PG & Research Department of Mathematics

^{1,2,3}Jamal Mohamed College (Autonomous), Affiliated to Bharathidasan University,
Tiruchirappalli-20, Tamil Nadu, India.

¹ganijmc@yahoo.co.in, ²shafinabanu@yahoo.co.in

Abstract

In the current effort, fixed point & common fixed point theorems on fuzzy semi – norm using ψ – weak contractive, ψ_f – weak contraction & $\psi_{(T,f)}$ – weak contraction are discussed.

A STUDY OF QUEUING MODELS IN A CAFE

¹Dr. N. ParanJothi, ²Dr.L.Mohanapriya and ³C.Arivumani

¹Asst. Professor, Dept of Statistics, Annamalai University, Chidambaram.

²Asst. Professor, Dept of Statistics, Govt. Arts College for women, Hosur.

³Research Scholar, Annamalai University, Chidambaram.

arivu1722@gmail.com

Abstract

This study aims to show the queuing theory of the stochastic model that applied in a practical scenario. Collected data from a famous restaurant in Tirupatur. The various performance measures as utilization rate, waiting time queue length and probability of potential customers to back based on the data have been studied balking using little's formulae. Study in one way is helpful to increase the quality of service in the restaurant by anticipating many customers in the queue; on the otherhand the restaurant can set a target profit that should be achieved on daily basis. By our numerical value we have shown mathematically that the service time is should be improved in preventing customers balking and competitive restaurant. The study gives more significance than the simulation models.

WELL-COVEREDNESS OF LINE GRAPHS OF ZERO DIVISOR GRAPHS

M. Subathra

Assistant Professor, Department of Mathematics, Lady Doak College, Madurai
Subathra@ldc.edu.in

Abstract

For a commutative ring R , the zero divisor graph $\Gamma(R)$ is a graph with nonzero zero divisors as a vertex set and two distinct vertices x and y are adjacent iff $xy = 0$. In this paper, Well-coveredness of line graphs of zero divisor graphs are characterized.

COVER EDGE PEBBLING NUMBER FOR JAHANGIR GRAPHS $J_{1,M}$, $J_{2,M}$, $J_{3,M}$, $J_{4,M}$ AND $J_{5,M}$

¹Priscilla Paul A and ²Anisha

¹Research Scholar, Department of Mathematics,
Sadakathullah Appa College (Autonomous), Rahmath Nagar, Tirunelveli-627011,
Affiliated to Manonmaniam Sundaranar University, Abishekapatti,
Tirunelveli-627012, Tamilnadu, India.

Assistant Professor, Department of Mathematics, Lady Doak College (Autonomous), Madurai, India
(Department of Mathematics, Lady Doak College (Autonomous), Madurai, India)
¹priscillapaul@ldc.edu.in, ²20pgm005@ldc.edu.in

Abstract

Let G be a connected graph. An edge pebbling move on G is the process of removing two pebbles from one edge and placing one pebble on the adjacent edge. The cover edge pebbling number of G , denoted by $CP_E(G)$ is the minimum number of pebbles required to place a pebble on all the edges of G , however might be the initial configuration is. In this paper, we determine the cover edge pebbling number for Jahangir graphs $J_{1,m}$, $J_{2,m}$, $J_{3,m}$, $J_{4,m}$ and $J_{5,m}$.

ODD PRIME LABELING OF GRAPHS RELATED TO CIRCULAR LADDER

¹S.Meena, and ²G. Gajalakshmi.

¹Associate Professor & Head and ²Research Scholar, Department of Mathematics,
Govt. Arts & Science College, Chidambaram– 608 102, India.
gaja61904@gmail.com

Abstract

In a graph $G = (V, E)$ a mapping f is called an odd prime labeling if f is a bijection from V to $\{1, 3, 5, \dots, 2|V|-1\}$ satisfying the condition that for each uv in G the greatest common divisor of the labels of the end vertices $(f(u), f(v))$ is one.. In this paper we prove that odd prime labeling of graphs related to circular ladder of cycle related graphs and we prove that the graphs such as $CL(n)$, $SCL(n)$, $CL(n) \odot K_1$, $CL(n) \odot K_2$, $CL(n) \odot K_3$ are all odd prime graphs.

PRODUCT CORDIAL LABELLING FOR SOME BICYCLIC GRAPH

¹S. Meena and ²S. Usharani

¹Associate Professor and ²Research Scholar Department of Mathematics, Govt. Arts College,
Chidambaram – 608 102, India.
¹meenasaravanan14@gmail.com; ²usharanism@gmail.com

Abstract

A graph $G = (V(G), E(G))$ is said to be a product cordial graph if there exists a function $f : V(G) \rightarrow \{0, 1\}$ with each edge assign the label $f(r) \cdot f(t)$ such that the number of vertices with label 0 and the number of vertices with label 1 differ at most by 1 and the number of edges with label 0 and the number of edges with label 1 differ by at most 1. In this case f is called a product cordial labelling of G . In this paper we investigate the existence of product cordial labelling of some graphs related to bicyclic graphs $B(n, n)$ such as $B(n, n) * S_m$, $B(n, n) * P_2 * S_m$, $B(n, n) * P_3 * S_m$, $B(n, n) * K_2$ and $B(n, n) * K_3$.

AN ANALYSIS OF MULTI-OBJECTIVE FUZZY STOCHASTIC NONLINEAR PROGRAMMING MODELS

¹Thangaraj Beaula and ²Seetha R

¹Department of Mathematics, TBML College, Porayar– 609 307, Tamil Nadu, India.

Affiliated to Bharathidasan University

edwinbeaula@yahoo.co.in

²Department of Mathematics, E.G.S. Pillay Engineering College(Autonomous)

Nagapattinam– 611002, Tamil Nadu, India.

rseethamathi82@gmail.com

Abstract

A novel method is developed for multi-objective fuzzy stochastic nonlinear programming models with some stochastic constraints in which randomness is described by gamma random variables and fuzziness is expressed by L-R fuzzy numbers. The solution for aforesaid model is obtained by three stages: Defuzzification, conversion of MOSNLPP into MONLLP using chance constrained technique and solving multi objective deterministic nonlinear programming problem. An example is exemplified to validate and strengthen the efficacy of proposed technique.

A NOTE ON COMPATIBLE NORM OF CIRCULANT FUZZY MATRICES

¹A. Pappa, ²P. Muruganantham and ³A. Nagoor Gani

*¹Research scholar P.G and Research Department of Mathematics,
Jamal Mohamed College (Autonomous) Affiliated to Bharathidasan University,
Tiruchirappalli-620020, India*

*²Assistant Professor, ³ Associate Professor, P.G and Research Department of Mathematics,
Jamal Mohamed College (Autonomous),*

Affiliated to Bharathidasan University, Tiruchirappalli-620020.India

¹pappa740@yahoo.com, ²pmananthjmc@gmail.com, ³ganijmc@yahoo.co.in

Abstract

Circulant matrix is a square matrix whose rows are obtained by cyclically rotating by its first row. The purpose of this paper introduces some algebraic properties of circulant fuzzy matrices on compatible norm CFM_c . Some idea of reflexive, symmetric, transitive, idempotent, determinant and adjoint of circulant fuzzy matrices (CFM_c) are discussed. A new type of semiring properties have been studied.

PICTURE FUZZY IDEALS IN GAMMA SEMIGROUPS

¹Hema. R and ²Anitha alias Ponnammal. D

*¹Department of Mathematics Annamalai University, Chidambaram
(Deputed to Government Arts and Science College, Nagercoil- 4)*

*²Department of Mathematics Annamalai University, Annamalai Nagar
Chidambaram-608002, Tamil Nadu, India, anithaaravi04@gmail.com*

Abstract

The picture fuzzy ideals in gamma semigroups have been introduced and some of their properties have been investigated. In this paper, the theory is illustrated by some examples connected with the notion of picture fuzzy bi-gamma ideals in gamma semigroups.

ON BOUNDS FOR CERTAIN CLOSED NEIGHBOURHOOD TOPOLOGICAL INDICES

¹M. S. Srinivasan and ²R. Helen

^{1,2} PG & Research Department of Mathematics, Poompuhar College (Autonomous)
(Affiliated to Bharathidasan University, Tiruchirappalli), Melaiyur - 609107, Tamil Nadu, India.
¹mssn84@gmail.com, ²helenranjan@gmail.com

Abstract

Consider $G = (V, E)$ be a simple, finite, undirected and connected graph as having τ edges and η vertices. The vertices s and w are connected by the edge sw . The degree of a vertex $s \in V(G)$, denoted by $d_G(s)$ is the number of vertices that are adjacent to s and $N[w]$ is the closed neighbourhood set of a vertex w that includes w and its neighbours. Using this concept, we derived the lower and upper bounds for some closed neighbourhood topological indices in this paper.

AN APPLICATION OF TRIANGULAR FUZZY NUMBER MATRICES WITH TRIPLET OPERATOR IN MEDICAL DIAGNOSIS

¹A.Nagoor Gani, ²M.Affrose Begum and ³P.Muruganantham

^{1,2,3} P.G. & Research Department Mathematics, Jamal Mohamed College (Autonomous),
(Affiliated to Bharathidasan University), Tiruchirappalli-620020, India.
¹ganijmc@yahoo.co.in@gmail.com, ²affrose786@gmail.com.

Abstract

Fuzzy set theory and fuzzy logic plays an essential role in medical field. Fuzzy logic deals a monotony models in complicated structure of medical diagnosis model. Fuzzy logic systems are excellent in handling ambiguous and imprecise information prevalent in medical diagnosis. A new method of medical diagnostic model using Triplet operator is presented in this paper.

THE MIDDLE DOMINATING FUZZY GRAPH OF A FUZZY GRAPH

¹A. Nagoor Gani, ²A. Nafiunisha and ³P.Muruganantham

^{1,2,3} P.G. & Research Department of Mathematics, Jamal Mohamed College (Autonomous),
(Affiliated to Bharathidasan University), Tiruchirappalli-620020, India
¹ganijmc@yahoo.co.in; ²nishamaths.nisha20@gmail.com

Abstract

In this paper we introduce a new type of Dominating Fuzzy Graph such as The Middle Dominating Fuzzy Graph of a Fuzzy Graph. The Middle Dominating Fuzzy graph is denoted by $MdF(G): (\sigma_m, \mu_m)$ and is defined to be the intersection graph on the minimal dominating sets of vertices in Fuzzy Graph. And characterizations are given for fuzzy graphs whose dominating fuzzy graph is connected and complete. Some other results are established relating to this new Fuzzy Graph.

SOME ASPECTS ON FULLY COMPLETE DOMINATION IN PICTURE FUZZY GRAPHS BASED ON STRONG EDGES

¹A Nagoor Gani, ²V. Anusuya and ³N. Rajathi

¹Associate Professor, PG and Research Department of Mathematics,
Jamal Mohammed College, (Affiliated to Bharathidasan University),
Trichy-20, TamilNadu, India.

²Associate Professor and ³Research Scholar, PG and Department of Mathematics,
Seethalakshmi Ramaswami College
(Affiliated to Bharathidasan University), Trichy-2, TamilNadu, India.
n.rajianand@gmail.com

Abstract

The Picture fuzzy graph is an efficient mathematical tool for dealing ambiguous real world problems where the fuzzy graph and intuitionistic fuzzy graph would not produce high accuracy. It can be used in various situations in which there are multiple choices of such type yes, no, abstain and refusal. The primary aim of this paper is to define the fully complete domination in picture fuzzy graph based on strong edges. Due to the importance of the notion of domination and its applications in numerous instances, we introduce fully complete picture fuzzy dominating set. In addition, many significant properties related to this parameter are obtained. Further, the relation between the fully complete picture fuzzy domination number and its picture fuzzy domination number is discussed. Some theorems are proved with suitable examples. To find the fully complete picture fuzzy dominating set and its domination number, an algorithm is discussed.

FUZZY NORM AND BEST APPROXIMATION IN α – NORM ON LINEAR SPACE

R. Angeline Sarguna Gifta

Assistant Professor of Mathematics

T.B.M.L. College (Affiliated to Bharathidasan University)

Porayar, Tamil Nadu, India.

Email: giftaangelin@gmail.com

Abstract

In this paper, the main aim is to introduce the notion of fuzzy normed linear space as of normed space and ascending family of α -norms corresponding to fuzzy norm is discussed. Also, Best approximation sets in α - norms are defined. We also provide some results on best approximation sets in α -normed space.

K-PRODUCT CORDIAL LABELING OF PATH GRAPHS

K. Jeya Daisy

Department of Mathematics Holy Cross College Nagercoil, Tamilnadu, India. E-mail:
jeyadaisy@yahoo.com

R. Santrin Sabibha

Research scholar Register no.: 20212072092001 Manonmaniam Sundaranar University Tirunelveli,
Tamilnadu, India. E-mail: sanithazhi@gmail.com

P. Jeyanthi

Research Centre, Department of Mathematics Govindammal Aditanar College for Women
Tiruchendur 628215, Tamilnadu, India E-mail: jeyajeyanthi@rediffmail.com

Maged Z. Youssef

Department of Mathematics and Statistics College of Science Imam Mohammad Ibn Saud Islamic
University Riyadh 11623, Saudi Arabia. Department of Mathematics, Faculty of Science Ain
Shams University, Abbassia, Cairo, Egypt. E-mail: mzyoussef11566@yahoo.com

Abstract

The concept of k -product cordial labeling was defined by Ponraj et al. as follows: Let f be a map from $V(G)$ to $\{0, 1, \dots, k-1\}$ where k is an integer, $1 \leq k \leq |V(G)|$. For each edge uv assign the label $f(u)f(v) \pmod k$. f is called a k -product cordial labeling if $|v_f(i) - v_f(j)| \leq 1$, and $|e_f(i) - e_f(j)| \leq 1$, $i, j \in \{0, 1, \dots, k-1\}$, where $v_f(x)$ and $e_f(x)$ denote the number of vertices and edges respectively labeled with x ($x = 0, 1, \dots, k-1$). Inspired by this concept we further studied and established several results. It is yet another study and in this paper we establish that k -product cordial labeling of path graphs P_n .

SENSITIVITY ANALYSIS OF THE COVID-19 MODEL IN HOSPITAL ENVIRONMENT

¹Nandhini M and ²Lavanya R

Assistant Professor, Coimbatore Institute of Technology, Coimbatore.
nandhinimohankumar@gmail.com

Abstract

In this paper, a mathematical model that describes the transmission dynamics of corona virus via infected individuals who died due to COVID-19 is proposed. It will be hazardous to the health and safety of healthcare workers and family members who do not follow guidelines when handling corpses from death to burial. The analysis of the model begins by defining the Meena invariant region. The next-generation matrix is employed to calculate the reproduction number. We investigate the sensitivity of the model to each parameter. In the numerical simulation, we can see the effect of each parameter on the reproduction number graphically. We can control the influencing parameter responsible for increasing the rate of infection spread, thereby allowing us to have an infection-free community.

A METHOD TO EVALUATE THE EVIDENCE DEPENDABILITY ON THE STIMULUS OF NEUTROSOPHIC SET

¹R.Irene Hepzibah and ²D.Leonita

¹PG & Research Department of Mathematics, T.B.M.L.College, Porayar, Tamilnadu, India.
(Affiliated to Bharathidasan University)
ireneraj74@gmail.com

²PG & Research Department of Mathematics, Idhaya College for Women, Kumbakonam,
Tamilnadu, India.
(Affiliated to Bharathidasan University)
leodominic59@gmail.com

Abstract

In Evidence Theory, Basic Probability Assignment plays an important role. The Basic Probability Assignment is usually provided by experts. The evaluation of Evidence Dependability is till open issue, when preliminary data is unavailable. In this paper, we propose a new method to evaluate Evidence Dependability on the stimulus of Neutrosophic Set. The dependability of evidence was evaluated based on the truth degree between Basic Probability Assignments (BPAs). First Basic Probability Assignment were revamp to Neutrosophic set. By the similarity degree between the Neutrosophic set, we can obtain the truth degree between the Basic Probability Assignments (BPAs). Then dependability of evidence can be computed based on its rapport with truth degree. Based on the new evidence dependability, we formulated a new method for combining evidence sources with different dependability degrades. Finally, the validity of the proposed method is exemplified by the real life example.

ON NANO REGULAR **b**-CLOSED SETS AND NANO REGULAR **b**-OPEN SETS IN NANO TOPOLOGICAL SPACES

¹P.Srividhya and ²T.Indira

¹Research Scholar, Department of Mathematics,
²Associate Professor, Department of Mathematics,
Seethalakshmi Ramaswami College(AffiliatedtoBharathisanUniversity),
Tiruchirappalli, TamilNadu, India. drtindira.chandru@gmail.com

Abstract

This paper is to introduce a new class of nano closed and nano open sets namely, Nano regular **b**-closed sets (briefly Nrb-closed sets) and Nano regular **b**-open sets (briefly Nrb-open sets) in nano topological spaces and to compare this with some other Nano closed sets such that Nano regular closed, Nano generalized closed, etc. Then the Nano regular **b**-interior, Nano regular **b**-closure are introduced and some of their properties are discussed.

A MATHEMATICAL ANALYSIS OF DSSC PARAMETERS ESTIMATION USING FUZZY SETS BASED ON ORGANIC DYES 5-METHYL SALICYLIDENE AND 5-NITRO SALICYLIDENE FOR DYE SENSITIZED SOLAR CELL USING TiO_2 AND V_2O_5 COMPOUNDS

¹G Ragasudha, ²R Irene Hepzibah and ³R Idamalarselvi

¹Department of Physics, D G Government Arts College,(Affiliated to Bharathidasan University)
Mayiladuthurai – 609 001, Tamil Nadu, India.

²Department of Mathematics, TBML College,(Affiliated to Bharathidasan University),Porayar–
609 307, Nagapattinam, Tamil Nadu, India.

Abstract

To design the DSSC circuit, light absorption from organic dyes must reach the maximum visible and near infrared spectrum values. This research examined improvement of efficiency DSSC transparent by optimizing of Synthetic organic dyes (5NSA and 5MSA). And the concept fuzzy system by developing a mathematical modeling of the DSSC performance of the solar cell TiO_2 and V_2O_5 with 5NSA, 5MSA and the results conforms the best output of the solar cell. Synthetic organic dye in this research used 5-Nitro salicylaldehyde and 5-Methylsalicylaldehyde with aniline. 5NSA and 5MSA dyes with optimized choice of agents indicated that improved photovoltaic impacts contrasted with organic dyes sensitization and increased the absorption of solar light and allowed utilization of the photon energy more efficiently. With using Doctor blade method coating ,FTO glass with TiO_2 and V_2O_5 as working electrode and opposite electrode used FTO glass with graphite. To determine the efficiency of (TiO_2+5NSA) , (TiO_2+5MSA) , (V_2O_5+5NSA) and V_2O_5+5MSA) DSSC for characterization of using Direct sunlight in different locations (Mayiladuthurai(L1), Nagapattinam(L2), Vedaranyam(L3)) using Digital multimeter. The BPA of the efficiency of DSSC (TiO_2+5NSA) , (TiO_2+5MSA) , (V_2O_5+5NSA) and V_2O_5+5MSA) cell of Mayiladuthurai, vedaranyam have been Nagapattinam are obtained from the questionnaire of some domain experts of our research work.

COMPUTATION OF NUMEROUS TOPOLOGICAL INDICES OF DUTCH WINDMILL GRAPH D_n^m

¹R. H. Aravinth and ²R. Helen

PG & Research Department of Mathematics.

Poompuhar College (Autonomous),

(Affiliated to Bharathidasan University, Tiruchirapalli), Melaiyur 609107, Tamil Nadu, India.

¹aravinthrh@gmail.com, ²helenranjan@gmail.com

Abstract

In this paper, we evaluate sum and product versions of the Forgotten index, Symmetric Degree Division index, Inverse Sum index, Balaban index, first, second, and the third kind of Revan indices along with their hyper versions for D^n . Finally, the Sanskruti index is also computed for the Dutch windmill graphs in terms of n and the number of copies m.

MODELING THE TRANSMISSION DYNAMICS OF CANDIDA AURIS INFECTIONS AMONG PATIENTS IN CRITICAL CARE FACILITIES: SENSITIVITY ANALYSIS AND NUMERICAL INVESTIGATIONS

¹*U K Shyni and* ²*R Lavanya*

¹Research Scholar and ²Assistant Professor

Department of Mathematics

Coimbatore Institute of Technology, Coimbatore

Coimbatore – 641014

¹shyni.uk@cit.edu.in ; ²lavanya.r@cit.edu.in

Abstract

Hospital Acquired Infections (HAI) is one of the secondary causes of death among patients seeking critical care treatments in hospitals. The immune compromised condition of the patients and their history of exposure to wide spectrum antibiotics and antifungals as a part of treatment protocols for underlying medical conditions make them highly susceptible to opportunistic infections in hospital settings. The emergence of one such opportunistic fungal pathogen **Candida Auris** in the recent times has become a cause of grave concern among health practitioners due to its multidrug resisting properties, high probability of laboratory misidentification and its ability to induce infections that can lead to high mortality and morbidity among patients. The aim of this paper is to investigate the role of Health Care Workers and environmental contamination in the dynamics of Candida Auris infection spread among patients through mathematical modeling. We analyze the deterministic model for its basic properties and compute the basic reproduction number using the next generation matrix. Sensitivity analysis performed helps to identify the influence of each model parameter on the general dynamics of the model. The outcomes of the numerical investigation are illustrated graphically.

SOME RESULTS ON RAINBOW CONNECTION NUMBER OF GRAPH

¹*T. Aruna and* ²*S.P. Jeyakokila*

^{1,2} Department of Mathematics, Lady Doak College, Madurai-625002, India.

Abstract

Let G be a connected graph on which an edge coloring $c : E(G) \rightarrow \{1, 2, \dots, k\}$, $k \in \mathbb{N}$, is defined, where adjacent edges may be colored by the same color. The graph G is rainbow connected and the edge-coloring c is called rainbow coloring if there exists a rainbow path between every two vertices of G . Rainbow connection number of a graph G , denoted by $rc(G)$ is the minimum number of colors which are needed in order to make G rainbow connected. In this paper, the rainbow connection number for some graphs such as Cocktail party graph, Onion graph, line graph of Wheel graph are determined and $rc(G) = \sum_{i=1}^n rc(B_i)$ if G is a connected graph with a cut vertex and has 'n' number of blocks B_i , is proved.

ON SOLVING FULLY FUZZY NEUTROSOPHIC LINEAR COMPLEMENTARITY PROBLEM

¹*R. Irene Hepzibah and* ²*N. Sudha*

¹PG & Research Department of Mathematics, T.B.M.L College
(Affiliated to Bharathidasan University, Tiruchirappalli) Porayar, Tamilnadu, India.

²PG & Research Department of Mathematics, Idhaya College for Women,
(Affiliated to Bharathidasan University, Tiruchirappalli) Kumbakonam, Tamilnadu, India.

¹ireneraj74@gmail.com, ²sudhaan551@gmail.com

Abstract

This paper presents, a new approach to solve Fully Fuzzy Neutrosophic Linear Complementarity Problem (FFNLCP). The Neutrosophic Linear Complementarity Problem models with their parameters represented by trapezoidal neutrosophic numbers were presented here. Two ranking functions are introduced according to the problem type, for converting Neutrosophic Linear Complementarity problem to crisp Linear Complementarity problem. The effectiveness of the proposed model was applied to both maximization and minimization problems.

FUZZY SOFT VECTOR SPACE

S. Barkavi,

Assistant Professor, Department of Mathematics,
C. Kandaswami Naidu College for Women, Cuddalore.

barkavi79@gmail.com

Abstract

This paper defines a definition of fuzzy soft vector spaces (FSVS) and the concept of fuzzy soft vector spaces is applied to the elementary definition of vector spaces. With the new concept fundamental notions are those of basis, dimension, span and linear dependence is developed in this paper.

S-TOPOLOGICAL BE-ALGEBRAS

¹*P. Lakshmi Kumari and* ²*V. Thiruveni*

¹Panchayat Union Middle School,
Kuppampatti, Virudhunagar, Tamil Nadu, India.

laksnagarajan@gmail.com

²Saiva Bhanu Kshatriya College,
Aruppukottai, Tamil Nadu, India.

thiriveni2009@gmail.com

Abstract

In this paper, we introduce the concept of S-topological BE-algebra as a generalization of the concept of topological BE-algebra by using the concepts of semi-open sets. We investigate some of its properties. An S- topological BE-algebra is a BE-algebra equipped with a special type of topology, that makes the operation defined on it, S-topologically continuous.

ANTIMAGIC LABELING OF COMPLETE GRAPHS AND ITS APPLICATION IN CHESSBOARD

¹*S.P.Nandhini* and ²*A.Shaarudharshini*

¹ Assistant Professor and ² Research Scholar

The Standard Fireworks Rajaratnam College for Women, Sivagasi
spnandhinimani@gmail.com

Abstract

The Purpose in this work is to extend antimagic labeling in complete graph K_n and defined special type of labeling such as Maximum Arithmetic Antimagic Labeling(MAAL) , Minimum Arithmetic Antimagic Labeling (MIAAL),Maximum Product Antimagic Labeling(MPAL),Minimum Product Antimagic Labeling(MIPAL).In this research we will check whether K_n it satisfies Maximum Arithmetic Antimagic Labeling(or not ie. K_n is MAAL or not and similarly to other 3 mentioned Labeling. Also Additionally discussed some applications of antimagic labeling in Chessboard.

FUZZY MULTI-OBJECTIVE ASSIGNMENT PROBLEMS USING DIAGONAL OPTIMAL METHOD

¹*Thangaraj Beaula* and ²*S. Saravanan*

¹ Associate Professor and Head, P.G and Research Department of Mathematics,
T.B.M.L. College (Affiliated to Bharathidasan University), Porayar – 609 307,
Tamil Nadu, India.

² P.G. Assistant in Mathematics, KMHSS, Mayiladuthurai - 609 001.

¹edwinbeaula@yahoo.co.in; ²yessaravananpg@gmail.com

Abstract

In this paper Fuzzy Multi-Objective Assignment Model with several fuzzy parameters are taken. The Mathematical formulation of Fuzzy Multi-Objective Assignment Model is to find the optimal solution by the proposed Diagonal Optimal Method with numerical problems.

IRREGULAR BIPOLAR FUZZY LABELING GRAPH

¹*D.Rajalaxmi*, and ²*V.Vijaya*,

PG and Research Department of Mathematics, Seethalakshmi Ramaswami College, (Autonomous),
Trichy-2

rajalaxmimat@gmail.com

Abstract

In this paper a new concept of bipolar fuzzy labeling graph is introduced. Irregular, neighbourly irregular and highly irregular graphs are defined, based on the open and closed neighbourhood degrees. And some of the properties of these graphs are discussed. Also the concept of semi regular bipolar fuzzy labeling graph is defined by investigating some of its salient properties.

FINDING CRITICAL PATH IN A FUZZY PROJECT NETWORK USING NEUTROSOPHIC FUZZY NUMBER

¹V.Vijaya and ²D.Rajalaxmi

PG & Research Department of Mathematics,
Seethalakshmi Ramaswami College, Tiruchirappalli-620002, Tamilnadu, India.
(Affiliated to Bharathidasan University, Tiruchirappalli)
vvijayamanikandan@gmail.com, rajalaxmimat@gmail.com

Abstract

Fuzzy systems and Intuitionistic fuzzy systems cannot successfully deal with a situation where the conclusion is adequate, unacceptable and decision-makers declaration is uncertain. Neutrosophic sets are more practical and adequate than fuzzy and intuitionistic fuzzy systems. In this paper, we have used neutrosophic fuzzy numbers to solve the fuzzy critical path problem. A numerical example is given to illustrate the method.

AN INTRODUCTION TO PATHS ON INTUITIONISTIC FUZZY CONTROLLED GRAPH

E. Lilly Esther Rani

Assistant Professor of Mathematics
T.B.M.L. College (Affiliated to Bharathidasan University)
Porayar, Tamil Nadu, India.
jstharrani@gmail.com

Abstract

In this paper, a new type of graph namely, Intuitionistic Fuzzy Controlled Graph IFCG is introduced. The concepts like μ_T – path, strong μ_T – related path, strong ν_F – related path, strong $\mu_T - \nu_F$ related paths, Components and Autonomous are developed for IFCG and some theorems related to these concepts are presented.

ANALYSIS OF VARIANCE AND STANDARD DEVIATION OF FM/M/1/k INTERDEPENDENT STOCHASTIC FEEDBACK ARRIVAL MODEL WITH FINITE CAPACITY AND SINGLE SERVER

¹S.Gayathri and ²G.Rani

¹Research Scholar, ²Associate Professor
PG and Research Department of Mathematics, Seethalakshmi Ramaswami College
(Affiliated to Bharathidasan University), Tiruchirappalli-620 002, TamilNadu, India.
¹gayathrirocking1996@gmail.com, ²grsrc@yahoo.com

Abstract

In this paper, Analysis of variance and standard deviation of Interdependent Stochastic Feedback arrival rate and single server with service rate are considered. The steady-state solution and system characteristics are derived for this model. The analytical results are numerically illustrated by using Maple software and the effect of the nodal parameters on the system characteristics are derived and relevant conclusions are presented. Keywords: Interdependent stochastic feedback arrival rate, single-server with service rate, finite capacity, variance, standard deviation.

NOVEL LEVEL SHIFTED PWM TECHNIQUE FOR UNEQUAL AND EQUAL POWER SHARING IN QUASI Z SOURCE CASCADED MULTILEVEL INVERTER FOR PV SYSTEMS IN FUZZY ENVIRONMENT

¹M.Rajthilak, ²V.Sridhar and ³R.Irene Hepzibah

^{1,2} Department of Electrical and Electronics Engineering, Mookambigai College of Engineering, Kalamavur- 622502, Pudukottai, Tamilnadu India.

Affiliated to Anna University.

sreedhar599@gmail.com, thilakmce@gmail.com

³ PG & Research Department of Mathematics, T.B.M.L.College, Porayar-609307, Tamil Nadu, India.

Affiliated to Annamalai University.

ireneraj74@gmail.com

Abstract

Conventional Phase Shifted Pulse Width Modulation (PS-PWM) is a usual switching technique for Z source/ Trans-quasi-Z-source inverter (Trans-qZSI) based on Cascaded Multilevel Inverters (CMI). PS-PWM scheme causes higher switching losses and creates electromagnetic interference (EMI) problem for higher number of cascaded modules. To address these issues, novel modified Level Shifted PWM (LS-PWM) technique is proposed with the aim of obtaining equal power from cascaded modules under abnormal condition. The direct use of the Alternate Phase Opposed Disposed PWM (APOD-PWM) results in an unequal power sharing between the Trans-qZSI modules, under all operating conditions. An effective carrier rotation is incorporated in the conventional APOD-PWM to make the equal power sharing between the Trans-qZSI modules. Furthermore, the relation between the PS-PWM and APOD-PWM is geometrically obtained, which indicates that the proposed modulation scheme gives higher voltage gain over LS-PWM and PS-PWM techniques. Additionally, detailed switching loss analysis for the proposed PWM methods are added to validate low switching losses and thus high efficiency. A fuzzy simulation based analysis of the proposed system was done using MATLAB and the effectiveness of the proposed system was evaluated by doing a comparative study with the existing system.

MAX-MAX OPERATION ON α -UPPER LEVEL PARTITION OF FUZZY SQUARE MATRICES

S. Mallika

Assistant Professor and Head, Department of Mathematics,
Dharmapuram Adhinam Arts College, (Affiliated to Annamalai University)

Dharmapuram, Mayiladuthurai – 609 001, Tamilnadu, India.

yesmallika14@gmail.com

Abstract

In this paper, Max-max product of α - upper level partition of Fuzzy Square Matrix are defined and its some properties are established.

IDENTIFICATION OF EFFICACIOUS ALGORITHM VIA ROUGH SETS

¹Nirmala Rebecca Paul and ²R.Sangeetha

¹Department of Mathematics,²Department of Computer Science, Lady Doak College Madurai-625002, Tamilnadu, India

¹nirmalarebeccapaul@ldc.edu.in,²rsangeetha@ldc.edu.in

Abstract

The Rough set theory is introduced by Pawlak to deal with imperfect knowledge or vagueness. Many researchers applied the rough set theory concept in their area thereby contributed much to its development. It has application in different fields such as machine learning, knowledge acquisition, decision analysis etc. Rough sets are defined similar to topological operations called approximations. Hence Nano topology and Rough topology are introduced in terms of rough sets. It is proved that Nano topology is finer than Rough topology. In an information system there will be a number of condition attributes but only a few depicts the decision attribute. That is the decision attribute depends not on the whole set of condition attributes but on a subset of it called Core. Two algorithms were developed to find the core of an information system through Nano topology and Rough topology. In this paper another algorithm is developed to find the core of an information system in terms of accuracy of approximation. This algorithm is applied to find the core of an information system and an incomplete information system. Its efficiency is determined by comparing itself with already developed algorithm in terms of time complexity using BigO Notations

FIXED POINT THEOREMS IN FUZZY 2 - BANACH SPACE USING E.A PROPERTY

¹S.Princiya and ²S.N. Leena Nelson

Research Scholar, Department of Mathematics,

Womens Christian College, Nagercoil, Kanniyakumari Dist., Mononmaniam Sundaranar

University, Tirunelveli, Tamilnadu India

prncprincea@gmail.com

Abstract

The purpose of this paper is to obtain common fixed point theorems for weakly compatible mappings satisfying the property (E.A.) using implicit relation in Fuzzy 2 Banach Space allows replacing the completeness requirement of the Space with a more natural condition of closeness of the range.

VAGUE g FUNCTIONS IN VAGUE TOPOLOGICAL SPACES

¹E.L. Mary Tency and ²Pauline Mary Helen

¹Research Scholar and ² Assistant Professor

Department of Mathematics, Nirmala College For Women,

Coimbatore – 18

tencyelawrence@gmail.com

Abstract

In this paper we introduce vague continuous mappings, perfectly vague continuous mappings, completely vague continuous mappings, almost vague continuous mappings and vague irresolute mappings. We investigate some of their properties and also we provide some characterization of the above mappings.

GRAPH THEORETICAL APPROACH ON CONSTELLATIONS OF STARS

¹*Shreenitha S R and* ²*Subathra M*

Department of Mathematics, Lady Doak College, Madurai 625002, Tamilnadu, India.

¹20pgm046@ldc.edu.in²Subathra@ldc.edu.in

Abstract

In our solar system, there are 88 constellations. In this paper, all 88 constellations are considered as graphs. For that graphs, graph theoretical invariants such as independence number, chromatic number, clique number are studied.

A Note on Rank of Trapezoidal Fuzzy Number Matrices

¹*U. Hari Narayanan and* ²*K.Kumaresh*

^{1,2}*PG and Research Department of Mathematics, A.V.C. College,
(Affiliated to Annamalai University), Mannampandal - 609305, India*

hari.narayanan23@gmail.com

Abstract

In this article, some methods are described to find these types of ranks viz, row rank, column rank, fuzzy rank and fuzzy full rank using Trapezoidal fuzzy matrices (TrFMs). Also we investigated the relationship between them under the algorithm for Row Reduced Echelon Form (RREF). We have been studied the cross vector and schein rank under the relationship is illustrated with suitable example.

M/M/2 HETEROGENEOUS SERVER QUEUE WITH VARIANT BREAKDOWN AND WITH DISCOURAGED ARRIVALS

¹*R. Kalyanaraman and* ²*A. Hellen*

Department of Mathematics Annamalai University Annamalainagar - 608002

Tamilnadu, India

¹r.kalyan24@rediff.com,²hellenantonypushparaj@gmail.com

Abstract

In this article, we study a Markovian two heterogeneous server queue with two different breakdowns and with discouraged arrivals. We compute the system size probabilities in steady state with stability condition using Matrix-Geometric method. Also we compute some system performance measures. Finally, we present some numerical illustrations. Keywords: Working vacation; State dependent arrival rate; Matrix-Geometric method. MSC 2010 No.: 90B22, 60K25 and 60K30.

THE EFFECT OF EDGE REMOVAL IN PETERSEN GRAPHS

P.A. Shanthi

Department of Mathematics, Sri Sairam Engineering College Chennai 600 044,

Tamil Nadu, India

shanthi.maths@sairam.edu.in

Abstract

The value of $b_{mt}(G)$ for Petersen graphs $P(n, 1)$ and $P(n, 2)$ are obtained in this paper.

MAJORITY AND CONNECTED MAJORITY DOMINATION EDGE ADDITION (CRITICAL) GRAPHS

¹T. Muthukani Vairave¹ and ²J. Joseline Manora

¹Department of Mathematics, Kalasalingam Academy of Research and Education
(Deemed to be University), Krishnankoil, Srivilliputtur 626126 India.

muthukanivairavel@gmail.com

ORCID: 0000-0001-5627-6987.

²PG and Research Department of Mathematics, T.B.M.L. College, Porayar 609307
India. (Affiliated to Bharathidasan University, Tiruchirappalli)

ORCID: 0000-0002-5265-7413.

Abstract

This research article discusses the effects on the majority domination number $\gamma_M(G)$ and connected majority domination number $\gamma_{CM}(G)$ when the graph G is modified by adding an edge from the complement of a graph G . Further critical edges and redundant edges of G with respect to majority domination number and connected majority domination are studied.

ANNUAL RAINFALL FORECASTING USING FUZZY LOGIC INTERVAL BASED PARTITIONING IN DIFFERENT INTERVALS

¹Sugunthakunthalambigai .R and ²D.Rajan

¹ (Assistant professor), TNAU, Tamilnadu, India,

²Associate Professor of Mathematics, TBML College,
Porayar-609 307, Mayiladuthurai Dist.

Abstract

Fuzzy time series models have been put forward for rainfall forecasting from many researchers around the globe, but the prediction has not been very accurate rates of the existing methods. Frequency density or ratio based partitioning methods have been used to represent the partition of discourse. In this Paper, to make such predictions, we have used interval based partitioning as the partition of discourse and average rainfall of a city of Trichy district as the universe of discourse. Fuzzy models are used for prediction in many areas, like enrolments prediction, stock price analysis, Agricultural production, Horticultural production, Marine production and, weather forecasting.

ON FORECASTING TIME SERIES ANALYSIS UNDER FUZZY ENVIRONMENT

¹Sugunthakunthalambigai .R and ²D.Rajan

¹ (Assistant professor), TNAU, Tamilnadu, India,

²Associate Professor of Mathematics, TBML College,
Porayar-609 307, Mayiladuthurai Dit.

suguntha@gmail.com

Abstract

Fuzzy time series is an effective tool to deal with historical data. In fuzzy time series forecasting various methods have been developed to establish the fuzzy relations on time series data having linguistic values for forecasting the future values. However, the major problem in fuzzy time series forecasting is the accuracy in the forecasted values. In this paper, to forecast the average rainfall of a city of Trichy district using fuzzy time series approach based on average length of intervals.

INTUITIONISTIC FUZZY MULTI CRITERIA ANALYSIS USING ENTROPY WITH TOPSIS METHOD IN SCHOOL EDUCATION DURING COVID-19 PANDEMIC

¹*R. Irene Hepzibah and* ²*M. Kavitha*

¹PG & Research Department of Mathematics, T.B.M.L.College, Porayar, Tamil Nadu, India.
Affiliated to Bharathidasan University
ireneraj74@gmail.com

²Block Resource Center, Kelamangalam Block, Krishnagiri District, Tamil Nadu, India.
kavinmsc@gmail.com

Abstract

Learning method has been changed due to covid-19 pandemic. This research is proposed to analyse 32 criteria in the school education system based on survey data. The criteria performance will be evaluated from responses and it is helpful to find out strong and weak criteria. This Study provides significant inputs to develop the weaker criteria. A new muti-criteria assessment model is proposed to analyse criteria in school education during the pandemic situation. Entropy based weighted techniques with intuitionistic fuzzy Topsis method is proposed to analyse the criteria. It will be helpful to the organization to develop the weaker criteria. It is also proposed to apply it in real world problems.

A MATLAB PROGRAMMING APPROACH FOR OPERATORS ON SINGLE VALUED TRIANGLE AND TRAPEZOIDAL NEUTROSOPHIC NUMBERS

¹*R.Vidhya and* ²*R. Irene Hepzibah*

¹ Department of Mathematics, E.G.S.Pillay Engineering College, Nagapattinam, Tamil Nadu, India.

²Department of Mathematics, T.B.M.L College ,Porayar, Tamil Nadu, India.
¹vidhya14m@gmail.com, ²ireneraj74@gmail.com

Abstract

We utilized the concept of the single valued neutrosophic numbers (SVNS) which are a generalization of fuzzy numbers and intuitionistic fuzzy numbers in this paper. A single valued neutrosophic number is treated as an ordinary number whose accurate value is somewhat indecisive from an idealistic point of view. In this work, trapezoidal neutrosophic numbers (SVTraNns) with their properties are considered [Irfan Deli]. The same operations for single valued triangular numbers (SVTriNns) are extended in this work. Some operations and distances of the above numbers are defined. Ranking procedure is also considered. Due to the nature of SVNS, it is not easily possible to use manually in calculations. So, It is decided to include MATLAB programs for them. Some proposed MATLAB programs are discussed in this paper with illustrative examples to check the validity of the new approach with neutrosophic quantities.

CASSI – AN OPTIMAL ZEROS ASSIGNMENT METHOD FOR SOLVING ASSIGNMENT PROBLEMS

¹R. Murugesan and ¹T. Esakkiammal

¹Associate Professor, ²Full time Research Scholar

^{1,2}Department of Mathematics, St. John's College, Palayamkottai-627002

Affiliated to Manonmaniam Sundaranar University, Tirunelveli-627012,

Tamil Nadu, India.

¹rmuruges2020@gmail.com; ²tesakki98@gmail.com

Abstract

An assignment problem (AP) is a meticulous case of a transportation problem, in which the goal is to allocate a number of facilities to an equal number of activities at an overall maximum profit (or minimum cost, distance, time). It occupies a very significant role in the real physical world. The well known method applied to solve the APs is the Hungarian method, which generates optimal solution to most (not all) of the APs. In this research article, we make an attempt to bring in a new technique, known as CASSI for obtaining an optimal solution to any given AP.

MATHEMATICAL ANALYSIS OF A TUBERCULOSIS EPIDEMIC MODEL WITH NON-LINEAR INCIDENCE RATE AND TREATMENT

¹A. Ashika Sheraffin and ²S. Narmatha

^{1,2}Department of Mathematics, Lady Doak College, Madurai, Tamil Nadu, India

narmathasathyaa@gmail.com

Abstract

In this paper, a tuberculosis epidemic model with non-linear incidence rates is mathematically analyzed. This mathematical model involves five variables – susceptible, exposed, infectious (infectious being further classified into categories, latent infectious and resistant) and recovered. The new approach to homotopy perturbation method is used to obtain an approximate analytical solution to the model. In this work, the numerical solution of the problem is also obtained using the MATLAB software. A satisfactory agreement is acquired in the comparison of analytical solution and numerical solution. The effect of the various parameters on the mathematical model is also presented.

CHANGING AND UNCHANGING OF MAJORITY DOM-CHROMATIC NUMBER WHEN ADDING AN EDGE

¹ J. Joseline Manora and ²R. Mekala,

¹ Associate Professor, Department of mathematics, Tranquebar Bishop Manickam Lutheran College

(Affiliated to Bharathidasan University, Tiruchirappalli), Porayar. joseline_manora@yahoo.co.in

² Research Scholar Department of Mathematics, E.G.S Pillay Arts and Science College (Affiliated to Bharathidasan University, Tiruchirappalli), Nagapattinam. mekala17190@gmail.com

Abstract

In this article, for any edge of a graph, whether is or, when is modified by adding an edge between any two vertices are investigated and, are classified for some graphs. Also characterization theorems on and for connected and disconnected graphs are established.

AN EVIDENTIAL MODEL FOR ENVIRONMENTAL RISK ASSESSMENT IN BANANA PRODUCTION USING DEMPSTER SHAFER THEORY OF EVIDENCE.

¹*R.Irene Hepzibah and* ²*D.Leonita*

¹PG and Research Department of Mathematics, T.B.M.L.College, Porayar, Tamilnadu, India.

Affiliated to Bharathidasan University

ireneraj74@gmail.com

²PG and Research Department of Mathematics, Idhaya College for Women,

Kumbakonam, Tamilnadu, India.

Affiliated to Bharathidasan University.

leodominic59@gmail.com

Abstract

Environmental risk assessment is a tool to reduce the effects of various activities on the environment in order to attain enduring development. The probability impact matrix is commonly used in environmental risk assessment. Moreover, in the probability impact matrix method, numerical values of probability and impact of risk occurrence are very difficult and these factors are associated with uncertainty. Dempster Shafer Theory is efficient to deal with uncertain information. And also, Neutrosophic Logic was developed to represent mathematical model of uncertainty, vagueness, ambiguity in data. In this paper, an evidential model for environment risk assessment in Banana production is proposed based on the Dempster Shafer Theory. In addition the proposed model is compared with conventional risk assessment method. The comparative analysis shows that the proposed model has a high conceivability for environmental risk assessment under an uncertain information.

Commutative Monoid and Monoid Homomorphism Using Luka - Implication Operator Over Fermatean Fuzzy Matrices.

¹*K.Lalitha,* ²*N.Buvanewari and* ³*T.Muthuraji*

¹Department of Mathematics, Annamalai University,

Deputed to T.K.Government Arts College, Vridhachalam 606601, India

²Department of Mathematics, Annamalai University, Chidambaram 608002, India

³Department of Mathematics, Annamalai University,

Deputed to PG & Research Department of Mathematics,

Government Arts College, Chidambaram 608002, India,

sudhan_17@yahoo.com, n.buvanvardhana@gmail.com, tmuthuraji@gmail.com .

Abstract

We concentrate some logarithmic properties of the implication operator from Lukasiewicz's over Fermatean Fuzzy Matrices. We broaden these activities of IFMs to Fermatean fuzzy matrices and demonstrated their mathematical properties like distributivity, associativity, commutativity, and complementarity of these activities. We set up the arrangement of all FFMs forms a commutative monoid under these activities. Likewise, we depict a monoid homomorphism over FFM.

VARIANCE ESTIMATION FOR THE REGRESSION AND RATIO ESTIMATORS IN TWO PHASE SAMPLING

S. Eakambaram

Assistant Professor
Department of Statistics
Periyar Govt Arts College
Cuddalore 607001
eakambaram.s@gmail.com

Abstract

Regression analysis is a branch of statistical theory that is widely used in almost all the scientific disciplines. Its applications are extended to almost all the natural, physical and social sciences. The regression estimators and ratio estimators are commonly used in survey practice. In the past more attention has been given to the ratio estimator because of its computational ease and applicability for general sampling designs. The ratio estimator is appropriate for populations whose regression line passes close to the origin. If the intercept of the regression line is significantly non-zero, however, it is much less efficient than the regression estimator. Given the present computing capacity, the computational advantage of the variance of the ratio estimator should be less of a concern and the variance estimation for the regression estimators in Two Phase Sampling will gain wider popularity. This paper considers variance estimation for the regression and ratio estimators in two phase sampling. The result suggest that the variance estimators might provide more accurate standard error estimates foe ratio and regression estimators than those currently in use.

PRIME DISTANCE ANTI-MAGIC LABELING AND ITS SPECTRAL VALUES ON SOME SPECIAL GRAPHS

G. Chitra,

Assistant Professor, Kalasalingam Academy of Research and Education, Krishnankoil.
g.chitra@klu.ac.in

Abstract

A connected graph $G(V,E)$ is said to admit a prime distance anti-magic labeling if there exists an one-one function $f : V(G) \rightarrow \mathbb{Z}$ such that $|f(u) - f(v)|$ is a prime number for every pair of adjacent vertices u and v in G and also all the edge labeling must be distinct. In this paper we are discussed about prime distance anti-magic labeling of some special kind of graphs such as Caterpillar, Spider, Bi-Star, $C_n @ P_m$ and Binary tree graphs. Also we have calculated determinant, characteristic polynomial and characteristic roots of caterpillar and spider graphs.

ON SOLVING NEUTROSOPHIC UNCONSTRAINED OPTIMIZATION PROBLEMS BY NEWTON'S METHOD

¹*R. Irene Hepzibah and* ²*S. Shilpa Ivin Emimal*

^{1,2} P.G & Research Department of Mathematics

T.B.M.L college, Porayar-609 307, Mayiladuthurai Dist, Tamil Nadu, India

Abstract

In this paper, we proposed a method for solving unconstrained optimization problems by Newton's method with Single Valued Neutrosophic Triangular and Trapezoidal Fuzzy Number coefficients. Also, some numerical examples demonstrate the effectiveness of the proposed algorithm. MATLAB programs are also developed for the proposed method.

A NOVEL APPROACH TO THE RANKING OF GENERALIZED QUADRILATERAL FUZZY NUMBERS

¹*D.Stephen Dinagar and* ²*M.Manvizhi*

¹ Associate Professor, P.G. and Research Department of Mathematics
TBML College(affiliated to Bharathidasan University)

Porayar - 609307, Tamilnadu, India

² Assistant Professor, Department of Mathematics

Vivekananda College of Arts and Science for Women(affiliated to Bharathidasan University)

Sirkali - 609110, Tamilnadu, India

Abstract

The ranking of fuzzy numbers plays a critical role in making suitable conclusions in fuzzy decision-making problems. This study will offer a novel approach for the defuzzification of generalized quadrilateral fuzzy numbers(GQFN). In addition, the arithmetic operations on GQFN's and some properties are also provided. Finally, the numerical illustrations demonstrate the applicability and trustworthiness of the presented methodologies.

FUZZY ECONOMIC INVENTORY MODEL IN CLOUDY FUZZY ENVIRONMENT

¹*D.Stephen Dinagar and* ²*M.Manvizhi*

¹ Associate Professor, P.G. and Research Department of Mathematics
TBML College(affiliated to Bharathidasan University)

Porayar - 609307, Tamilnadu, India

² Assistant Professor, Department of Mathematics

Vivekananda College of Arts and Science for Women(affiliated to Bharathidasan University)

Sirkali - 609110, Tamilnadu, India

Abstract

For the advantage of their nature, fuzzy numbers are now frequently employed in various fields. This study proposes a cloudy generalized quadrilateral fuzzy number (CGQFN) as a new variant of the generalized trapezoidal fuzzy number. A new defuzzification method for CGQFN has also been proposed. To the application of CGQFNs, an economic inventory model has been proposed in a Cloudy fuzzy environment. A numerical example is also presented to support the suggested ideas.

DECISION MAKING IN FUZZY ENVIRONMENT USING PYTHAGOREAN FUZZY NUMBERS

¹*V. Vijaya and* ²*D.Rajalaxmi*

PG & Research Department of Mathematics,

Seethalakshmi Ramaswami College,(Autonomous),Tiruchirappalli – 620 002

(Affiliated to Bharathidasan University, Tiruchirappalli)

¹vvijayamanikandan@gmail.com,²rajalaxmimat@gmail.com

Abstract

Pythagorean Fuzzy Sets are usually depicted by four parameters, membership, nonmembership, strength and direction. In this paper, we have used Minkowski's distance to rank Pythagorean Fuzzy Numbers and apply it in decision making problems. A numerical example is provided to illustrate the method.

A SPREAD OF MINIMUM VERTEX COVER OF OPTIMIZATION MATCHING TECHNIQUES IN THE BIPARTITE GRAPH FOR SOLVING m –PENTAGONAL FUZZY LINEAR SUM BOTTLENECK ASSIGNMENT PROBLEMS

¹A. Nagoor Gani and ²T. Shiek Pareeth

PG & Research Department of Mathematics

Jamal Mohamed College (Autonomous)

Tiruchirappalli-620 020, Tamilnadu, India

¹ganijmc@yahoo.co.in, ²shiepareeth.t@gmail.com

Abstract

In this paper we presented a spread of minimum solution of fuzzy optimization matching procedure in the bipartite graph. it provides minimum vertex cover with edge set E for solving ω –Pentagonal Fuzzy Linear Sum Bottleneck Assignment Problems [ω – PFLSAP]. The bottleneck assignment problem is minimum cost and maximum matching in the bipartite graph. The Linear Sum Bottleneck Assignment Cost [LSBAC] we taken as ω –Pentagonal Fuzzy Numbers (ω – PFN).

COMPLEMENT IN FUZZY LABELING GRAPH

¹D.Rajalaxmi, and ²V.Vijaya

Dept. of Mathematics, Seethalakshmi Ramaswami College, Trichy, India – 620 002

Abstract

In this paper, the complement of a fuzzy labeling graph (FLG) is defined. A necessary condition for a fuzzy labeling graph G and G^c to be a fuzzy labeling tree is given. It has been proved that every fuzzy labeling graph G and G^c have $(n-1)$ bridges. If G^* is complete then it has been proved that G is connected. Some relation between the connectedness of G and G^c is derived. And also self complementary in fuzzy labeling graph is defined and it is proved that G^{**} is equal to G, if G^* is a tree.

S - BIDIAGONAL TYPE-2 TRIANGULAR FUZZY MATRICES

¹K.Latha , ²K.Thiripurasundari and ³B.Visali,

^{1,2}Assistant Professor and ³IIM.Sc Mathematics

PG and Research Department of Mathematics,

Poompuhar College, Melaiyur, India.

k.latha1976@yahoo.in

Abstract

The concept of type-2 fuzzy set was introduced by Zadeh as an extension of an ordinary fuzzy set. Type-2 fuzzy sets have grades of membership that are themselves fuzzy. Hence the membership function of a type-2 fuzzy set is three dimensional, and it is the new third dimension that provides new design degrees of freedom for handling uncertainties. Type-2 triangular fuzzy matrices are the generalization of fuzzy matrices. In addition fuzzy matrices play an important role in scientific developments. In this paper, the concept of S-bidiagonal type-2 triangular fuzzy matrices is proposed. Also the properties of S-bidiagonal type-2 triangular fuzzy matrices are discussed.

SOME SPECIAL FUNCTIONS INVOLVING TYPE-2 TRIANGULAR MIXED FUZZY NUMBERS

¹*K.Thiripurasundari*, ²*K.Latha* and ³*A.Arthi*,

^{1,2}Assistant professor, PG and Research Department of Mathematics,
Poompuhar College, Melaiyur, India;

³M.Sc Mathematics, PG and Research Department of Mathematics,
Poompuhar College, Melaiyur, India;
mktps83@gmail.com

Abstract

The concept of a type-2 fuzzy set which is an extension of the concept of an ordinary fuzzy set was introduced by Zadeh . Type-2 fuzzy sets have grades of membership that are themselves fuzzy . Type-2 fuzzy possess a great expressive power and are conceptually quite appealing. This paper deals with exponentiation, extracting nth root, taking logarithm of type – 2 triangular mixed fuzzy numbers using alpha cut method.

FIXED POINT THEOREM IN GENERALIZED FUZZY METRIC SPACES

J .Jayasingh Manohar

Assistant Professor of Mathematics
TBML College (Affiliated to Bharathidasan University)
Porayar, Tamil Nadu, India.

Abstract

In this paper our aim is to prove some fixed point theorems in Generalized Fuzzy Metric spaces through rational inequality. Our results extends and generalizes the results of many other authors existing in the literature. Some applications are also given in support of our results.

INTERVAL VALUED κ – KERNEL SYMMETRIC FUZZY MATRICES

¹*M. Kaliraja* and ²*T.Bhavani*

¹Assistant Professor, P.G. and Research Department of Mathematics, H.H. The Rajah's College,
Affiliated to Bharathidasan University, Pudukkottai, Tamilnadu, India.

²Assistant Professor, Department of Science and Humanities (Mathematics),
Sri Krishna College of Technology, Coimbatore, Tamilnadu, india.
¹mkr.maths009@gmail.com; ²bhavaniskct@gmail.com

Abstract

We enhance the equal characterization of interval valued κ –kernel symmetric fuzzy matrices in this study. Necessary and enough situations are decided for an interval valued matrix to be κ – kernel symmetric. We deliver few end result of interval valued kernel symmetric matrices. This leads to an interval valued κ – symmetric matrices implies interval valued κ – kernel symmetric matrices, but the converse is not required. Fundamental properties of interval valued κ – kernel symmetric fuzzy matrices are derived.

MATERIAL SELECTION FOR DENTAL IMPLANT-IF VIKOR MCDM TECHNIQUE

¹*K. Ruth Isabels, and* ²*G. Arul Freeda Vinodhini*

¹Research Scholar, Saveetha School of Engineering [SIMATS];

Associate Professor Department of Mathematics, Saveetha Engineering College.

²Assistant Professor, Department of Science and

Humanities, Saveetha School of Engineering,

Saveetha Institute of Medical and Technical Sciences [SIMATS]

ruthisabels@saveetha.ac.in

Abstract

Decision-making is the process of finding the best option among the feasible alternatives. Material selection is a complex multiple criteria decision-making (MCDM) problem, which considers several alternatives as well as conflicting criteria. Material selection may be a critical decision and one among the foremost important factors is to think about the planning. Selection of the proper material, which may be the most vital problem that material engineers frequently encounter. This paper aims to decide on the suitable material selection for the dental implant using the Intuitionistic Fuzzy VIKOR MCDM technique. Material alternatives and criteria have been chosen suitable for the discussion. At the end of the discussion, it was found the best material to be used in the design of the implant is chromium cobalt according to the Intuitionistic Fuzzy VIKOR MCDM technique.

ON COMPARISON OF FUZZY TRANSPORTATION PROBLEM WITH THE EXISTING METHOD

S. Christinal Gunaseeli

Assistant Professor of Mathematics

T.B.M.L. College (Affiliated to Bharathidasan University), Porayar, Tamil Nadu, India.

christinalgunaseelis@gmail.com

Abstract

In this article, we proposed two ranking functions called $\bar{\nu}\mu$ (Value Ranking) and \bar{A} (Ambiguity Ranking) to solve the transportation problem. The main aim is to compare the newly defined ranking function with the existing method (Roubast Ranking). Here, we compared it with an example and justified.

DI-DOMINATION PAIR OF SIMPLE GRAPHS

¹*S. Sivagnanapriya,* ²*V.T.Chandrasekaran and* ³*G.Rajasekar*

¹Research Scholar, ²Principal and ³Associate Professor Jawahar Science College, Neyveli

¹sgpriyamaths@gmail.com, ²vtcvtc14@gmail.com, ³grsmaths@gmail.com

Abstract

In this paper a new concept of domination, the definition of Di-dominating pair set of G and minimum cardinality of Di-domination pair are introduced. Di-dominating pair is defined as follows: Let S_1 and S_2 be two domination sets of G with $|S_1| = |S_2|$, If every vertex $v \in \bar{S}_1 \cap \bar{S}_2$ satisfies $N(v) \cap S_1 \neq N(v) \cap S_2$, then the pair (S_1, S_2) is called Di-dominating pair set (simply ddp set). The minimum of $|S_1|$ (or $|S_2|$) is called Di-domination pair number (ddp number) and is denoted as $\gamma_{ddp}(G)$. Also some theorems to find Di-dominating pair set for path, cycle, star, planner k -regular graph, complete graph, Gem graph, and it's some relative haven introduced.

DI-DOMINATION PAIR OF WHEEL AND ITS RELATED GRAPHS

¹S. Sivagnanapriya, ²V.T.Chandrasekaranand and ³ G.Rajaseka

¹Research Scholar, Jawahar Science College, Neyveli

²Principal, Jawahar Science College, Neyveli

³Associate Professor, Jawahar Science College, Neyveli

¹sgpriyamaths@gmail.com, ²vtcvtc14@gmail.com, ³grsmaths@gmail.com

Abstract

Let S_1 and S_2 be two domination sets of G with $|S_1| = |S_2|$, If every vertex $v \in \bar{S}_1 \cap \bar{S}_2$ satisfies $N(v) \cap S_1 \neq N(v) \cap S_2$, then the pair (S_1, S_2) is called Di-dominating pair set (simply ddp set). The minimum of $|S_1|$ (or $|S_2|$) is called Di-domination pair number (ddp number) and is denoted as $\gamma_{ddp}(G)$. In this paper find a Di-dominating pair set and minimum cardinality of Di-domination pair number of wheel and its related graphs. That is, some theorems to find Di-dominating pair set and number of wheel graph, Helm graph, Closed Helm graph, Flower graph, Double Wheel graph.

INTERVAL VALUED SECONDARY κ -RANGE SYMMETRIC FUZZY MATRICES

¹M. Kaliraja and ²T.Bhavani

¹Assistant Professor, P.G. and Research Department of Mathematics, H.H. The Rajah's College, Affiliated to Bharathidasan University, Pudukkottai, Tamilnadu, India.

²Assistant Professor, Department of Science and Humanities (Mathematics), Sri Krishna College of Technology, Coimbatore, Tamilnadu, india.

¹mkr.maths009@gmail.com; ²bhavaniskct@gmail.com

Abstract

In this paper, we have investigated the characterization of interval valued secondary κ - range symmetric fuzzy matrices. The relationship between interval valued s - κ range symmetric, interval valued s - range symmetric, interval valued κ - range symmetric and interval valued range symmetric matrices are discussed. The necessary and sufficient conditions for a matrix to be interval valued s - κ range symmetric fuzzy matrices are established.

SOME NEW RESULTS ON PALEY GRAPHS

¹A. Haritha and ²J. Chithra

¹II, M.Sc., Department of Mathematics,

² Associate professor, Department of Mathematics, Lady Doak College, Madurai-625002, India.

Abstract

$P_q(A, B)$ graph is a Paley graph with vertices $a \in A$ are the elements of finite field F_q and $b \in B$ are edges between elements $x, y \in A$ if and only if $x - y$ is a non-zero square in F_q , where $q \equiv 1 \pmod{4} = p^n$ (p is a prime number, n is any positive integer) is a prime power.. This paper aims to prove some new results on Paley graph. The main new results are Paley graph is its own closure, the planarity of the Paley graphs and the edge pebbling number of a Paley graph.

**ANALYSIS OF VARIANCE AND STANDARD DEVIATION OF FM/M/1/k
INTERDEPENDENT STOCHASTIC FEEDBACK ARRIVAL MODEL WITH FINITE
CAPACITY AND SINGLE SERVER**

¹S.Gayathri and ²G.Rani

¹Research Scholar, and ²Associate Professor

PG and Research Department of Mathematics, Seethalakshmi Ramaswami College
(Affiliated to Bharathidasan University), Tiruchirappalli-620 002, TamilNadu, India..

¹gayathrirocking1996@gmail.com, ²grsrc@yahoo.com

Abstract

In this paper, Analysis of variance and standard deviation of Interdependent Stochastic Feedback arrival rate and single server with service rate are considered. The steady-state solution and system characteristics are derived for this model. The effect of the nodal parameters on the system characteristics is established and using Maple software the analytical results are numerically illustrated and relevant conclusions are presented.

**UP AND DOWN SHIFTED PROPORTIONAL FUZZY STOCHASTIC
ORDERINGS BY USING EXPONENTIAL TRIANGULAR FUZZY RANDOM
VARIABLES**

¹C. Senthil Murugan and ²D. Rajan

¹Assistant Professor in Mathematics,

Swami Dayananda College of Arts and Science, Manjakkudi,
Affiliated to Bharathidasan University, South India.

senthilmurugan1978@gmail.com

²Associate Professor of Mathematics,

Tranquebar Bishop Manickam Lutheran College, Porayar,
Affiliated to Bharathidasan University, South India.

Abstract

L. A. Zadeh generated fuzzy set theory from the classical set theory, every element of the fuzzy set have degrees of membership function, At this point, the fundamentals of classical probability theory are used to motivate fuzzy probability theory. J.E.L. Priyakumar et al., (2001), introduced the definition of stochastic ordering of fuzzy random variables under the probability with fuzzy state, D. Rajan et al (2015) presents the stochastic ordering of triangular fuzzy random variables by following J.E.L. Priyakumar.

The exponential distribution correlated to the triangular fuzzy random variables which form a novel idea Exponential triangular fuzzy random variables.

The present paper explores the innovated definitions of stochastic orderings such as up shifted (increasing) proportional, down shifted (increasing) proportional and up & down shifted proportional fuzzy stochastic ordering of exponential triangular fuzzy random variables. Few theorems have been derived with the relationship among the given definitions.

STRONG AND WEAK SOLUTION OF FUZZY LINEAR SYSTEM OF EQUATIONS

¹Thangaraj Beaula, and ²L.Mohan

¹PG and Research Department of Mathematics, T.B.M.L.College, Porayar-609307.

²Dept of Mathematics, SRM Valliammai Engineering College, Kattankulathur,
Chennai -603203.

¹edwinbeaula@yahoo.co.in; ²mohanpckirisamy@gmail.com

Abstract

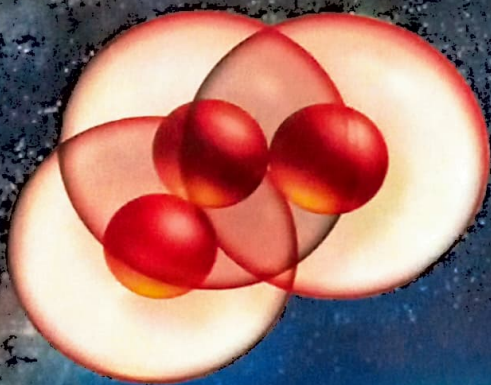
In this paper, strong solution of fuzzy linear system is defined. An algorithm is proposed to solve a fuzzy linear system using α -cuts of fuzzy trapezoidal number as parameters. The method is illustrated by a numerical example.

LOVE CONQUERS ALL



ATMOSPHERIC OZONE

- A Microview




**Johnson Jeyakumar
Vijayalakshmi
Kartharinal Punithavathy**

**Archers & Elevators Publishing House
www.aeph.in**

Our Services


ISBN | ISSN
Conferences | Seminar Collaborations
Marketing of Books
Publication of Books
Subject Books
Edited Volume Books
Ph.D thesis and Journals

AUTHORS PROFILE



Dr.S.JohnsonJeyakumar Studied Under Graduate, Post-Graduate and Re-research degrees at TBML College, Porayar, acquired Doctoral degree for the research carried out on surface ozone at tropical coastal locations, through the same institution, which is affiliated to Bharathidasan University, Tiruchirappalli, India. This first-ever study on ozone at this southern coastal part of India was well recognized by UNEP, during the Post-Tsunami period after G7 Tsunami 2004 extensive research was carried out through his research team. Presently working in the fields of Atmospheric physics, films, Nano technology and energy conservation. He has got more than 30 research articles published in peer reviewed International journals to his credit. Presently working and Associate professor of Physics at the same college and completing 28 years of service. Recognized as a Ph.D Research Advisor by Bharathidasan University and guiding many scholars.

Dr.S.Vijayalakshmi Working as Assistant Professor of Physics at Bharathiyar College of Engineering and Technology at Karaikal for the past 10 years. Wide spectrum of Education and training she acquired at various institutions enriched her knowledge and skill on the research of atmospheric Physics. Completed post-graduation at Pondicherry University, acquired M.Tech Ocean Technology at Cochin University of Science and Technology, then served as a Junior Trainee at SAC, ISRO, Ahmedabad and a Junior Research fellow at IIT, Delhi. Recently obtained Doctoral degree in Physics for the research carried-out on the surface Ozone and Nox studies at coastal atmospheres of Pondicherry UT. There are 06 research articles on her credit published in international journals.



Dr.I.KartharinaPunithavathy Associate professor of Physics, serving more than 30 years at TBML College Porayar, where she could complete her undergraduate, Post-Graduate and pre-research degree too. Her research work leading to Ph.D. degree was on surface ozone and its precursor nitrogen oxides at a remote coastal region in South India. She has published nearly 25 research articles in peer-reviewed International Journals and as Research Advisor, recognized by Bharathidasan University, guiding many research scholars for Ph.D. Presently concentrating in the fields of Atmospheric Physics and Nanotechnology. Received MRP from UGC for her research on Ozone.

Archers and Elevators Publishing House

131, AGB Layout, 6th Cross, Hesaragatta Main Road, Bangalore - 560090
Karnataka, India.

www.aeph.in | archerselevators@gmail.com | +91 91643 62263

Antiviral and Antimicrobial Coatings Based on Functionalized Nanomaterials

Design, Applications, and Devices



Edited by
Shahid Ul Islam
Chaudhery Mustansar Hussain
Sudheesh K. Shukla

2. Synthesis and characteristics of ZnO nanoparticles	369
3. Textile finishing of ZnO nanoparticles	374
4. Conclusions, opportunities, and future trends	381
Acknowledgments	382
References	383
12. Antimicrobial textiles based on nanoparticles and composite, antiviral and antimicrobial coatings based on functionalized nanomaterials	389
Monika Vats, Komal, Mansi Swami, Bharti Sheokand, Varun Rawat, Devendra Singh Negi and Anand Kumar	
1. Introduction	389
2. Types of nanomaterials and their applications	392
3. Synthesis and characterization	399
4. Antimicrobial and antiviral potential of nanomaterials	400
5. Functionalization of nanomaterials	404
6. Functionalized nanomaterials incorporation in textiles for antibacterial and antiviral properties	404
7. Antimicrobial textiles and nanotechnology	408
8. Major toxicity concerns	409
9. Conclusions and future prospects	411
References	412
13. Fabrication of functional nanoparticles onto textile surfaces with the use of metal (oxide) nanoparticles and biopolymers	421
Soorya Srinivasan, M. Jothibas and Noel Nesakumar	
1. Introduction	421
2. Biopolymers in the fabrication of metal nanoparticle functionalized fabrics	423
3. Conclusions and future prospects	438
Acknowledgment	439
References	439
SECTION 5 Functionalized nanoparticles-based antimicrobial coatings for biomedical applications	
14. Drug delivery and functional nanoparticles	447
Dipayan Roy, Anupama Modi, Ritwik Ghosh and Julián Benito-León	
1. Introduction	447
2. Classification	449

CHAPTER 13

Fabrication of functional nanoparticles onto textile surfaces with the use of metal (oxide) nanoparticles and biopolymers

Soorya Srinivasan¹, M. Jothibas¹ and Noel Nesakumar²

¹Research Department of Physics, T.B.M.L College (Affiliated with Bharathidasan University, Tiruchirappalli), Porayar, Tamil Nadu, India; ²School of Chemical and Biotechnology, SASTRA Deemed University, Thanjavur, Tamil Nadu, India

1. Introduction

In the period between 2015 and 2020, the market for functional textiles grew at a rate of 30% per year, demonstrating a significant increase in popularity across numerous industries. In particular, the sports, military, healthcare, fashion, and automotive industries have all made significant contributions to this development. There are numerous functional textiles available on the market with one or more of the following properties: electrically conductive, self-cleaning, wrinkle-resistant, antistatic, thermo-regulating, ultraviolet protective, sensing, windproof, heat-resistant, flame-retardant, odor control, oil/water repellent, and antimicrobial [1–3].

Nanotechnology has been extensively utilized in the fabrication of functional textiles and has the potential to transform clothing technology. Fabrics engineered with nanomaterials contribute to the development of textile-based nanoproducts, offering tailored physico-chemical properties without compromising the functionality and pliability of the substrates [4]. These textile-based nanoproducts are fabricated employing textiles made of nanofabrics or utilizing traditional textiles chemically modified with nanoparticles [5,6]. In particular, metal nanoparticles have been intensively investigated for textile functionalization owing to their unique biological, chemical, and physical characteristics [7,8]. Metal nanoparticles play a significant role in technological advances, as their exceptional surface properties allow them to be more effective than bulky traditional

Antiviral and Antimicrobial Coatings Based on Functionalized Nanomaterials

Design, Applications, and Devices

Antiviral and Antimicrobial Coatings Based on Functionalized Nanomaterials: Design, Applications, and Devices is the first book on functionalized nanoparticles-based coatings that encompasses the majority of aspects of antimicrobial and antiviral coatings. The use of functionalized nanoparticles has revolutionized all fields of science and engineering, and this book provides the reader with a fundamental, interdisciplinary look at this emerging field. It focuses on the most advanced coating systems being utilized by various industries including a discussion of the current challenges to be considered during manufacturing.

This book provides both academics and those working in industry with a broad-based introduction to the area of modern antimicrobial coatings practices.

Key Features

- Describes functionalized nanoparticles-based antimicrobial and antiviral coatings utilized in modern industrial platforms
- Evaluates functionalized nanoparticles-based antimicrobial and antiviral coatings as prime options for sustainable and transformational opportunities
- Serves as a reference for scientists and engineers who are searching for modern design techniques for antimicrobial and antiviral coatings systems

About the Editors

Shahid Ul Islam is a Fulbright Fellow at the University of California, Davis, USA. Prior to this, he has served as a faculty member of Chemistry at the Islamic University of Science and Technology (IUST), and a Principal Project Scientist at the Indian Institute of Technology Delhi (IIT Delhi), India. He is currently working on the interface of materials science and textile technology, with a main emphasis on the design and development of light-activated antibacterial and antiviral materials, films, and nanofibrous membranes for biological protection and food coating applications.

Chaudhery Mustansar Hussain, is an Adjunct Professor, Academic Advisor, and Lab Director in the Department of Chemistry & Environmental Sciences at the New Jersey Institute of Technology (NJIT), Newark, USA. His research is focused on environmental management, nanotechnology, advanced materials, and analytical chemistry of various industries.

Sudheesh K. Shukla works in the field of translational research and development of diagnostic approaches with respect to disease alerts and disorders with a major focus on interfacing chemistry and engineering for better healthcare applications. Currently, his research involves real-sample analysis of biochemical markers for personalized healthcare monitoring.



ELSEVIER

elsevier.com/books-and-journals

ISBN 978-0-323-91783-4



9 780323 917834

APPLICATION ORIENTED MATERIALS IN SCIENCE AND TECHNOLOGY



DR K SENTHILKANNAN

ANU BOOKS

- R. Sathishkumar^a, C. J. Magesh^b, M. Vimalan^c, I. Epsy Devakirubai^a,
S. Tamilselvan^{**} 42
- 11 Influence of SnO₂ Nano Particles on the Structural and Optical
Behaviour of PVA Film
R.Divya, M.Sree Bharati and M.Meena 47
- 12 Cost Effective Synthesis of Magnesium Ferrite Nano Particles for its
Structural and Magnetic Behaviour Analysis
M.Meena¹ and P. Aji Udhaya² 51
- 13 Studies on Photocatalytic activity of CuS_xO_(1-x) Nanocomposites
R.Veeralekshmi, K.U.Madhu 56
- 14 Effect of 60 MeV Si⁵⁺ Swift Heavy Ion Irradiation on the surface
modification of Hydroxyapatite and Polystyrene composite
R. Vani¹, K. Elayaraja² and S. Narayana Kalkura² 60
- 15 Synthesis, Characterization and Catalytic Activity Of Cysteine
Stabilized Silver Nanoparticles
K.murugananthan & R.Shanmugaraja 64
- 16 Refractive Index of 4-Benzeneazoaniline with Taxol
G Dhinakaran¹, K SenthilKannan^{2*}, K Venkatachalam¹, V Neelesh³ 68
- 17 Comparative Study On Mechano Luminescence Of Ce Activated
Aluminate Based Phosphor
Sapana singh¹, R k kuraria¹, S R Kuraria², 70
- 18 Structural and Morphological Properties of Ag doped ZnO Nanoparticles Synthesized by Sol-Gel Method
M. Jothibas^{a*}, A. Muthuvel^a, K.Senthilkannan^b 72
- 19 Studies on Some Amino Acids Substituted Hydroxyapatite
Elisabeth Rani. K, Aarthi. R and Ramachandra Raja. C 78
- 20 Sub-Zero Temperature Thermo-Electrochemical Energy Harvesting
System using Self-heating Negative Temperature Coefficient
CNT-Vanadium Oxide Cathode
S.Ramalingam, T. Prabhu, K. Singaravelan, R. Aarthi 82

Structural and Morphological Properties of Ag doped ZnO Nanoparticles Synthesized by Sol-Gel Method

M. Jothibas^{a*}, A. Muthuvel^a, K.SenthilKannan^b

^aPG Research Department of physics TBML College, Poraiyar, India

^bDepartment of physics/R&D, Edayathangudy GS Pillai Arts and Science College, Nagapattinam, India

Abstract

Pure and different concentration of Ag (1, 3 and 5 at. %)doped ZnO nanoparticles were synthesized by Sol-Gel technique. The products were characterized by X-ray diffraction (XRD), Scanning Electron Microscopy (SEM) with EDS *were studied*. The X-ray diffractometer were characterized Crystal structure and the average crystallite size varied from 17 to 11nm, Scanning Electron Microscopy (SEM), Energy dispersive analysis of X-rays spectroscopy (EDAX) spectrum indicates that the successful dopants of Ag peaks in the ZnO lattice and which indicates the purity of the sample.

Keywords: ZnO, Ag doped ZnO, XRD and SEM

Corresponding Author E-mail: jothibas1980@gmail.com

1. Introduction

Nanostructured semiconductors are of great interest due to their extraordinary physicochemical properties, which differ from their bulk counterparts. In the recent years, a number of investigations have focused on Nanoparticles have been successfully utilised in nano chemistry to enhance the activity of catalysts and their immobilization, in semiconductor in the field of medical and pharmaceutical sciences for the delivery of active pharmaceutical ingredients, in disease diagnostic sensors [1]. Metals such as silver, zinc, gold, have been used for centuries as bactericidal and bacteriostatic agents each with different properties and spectrums of activity. ZnO is a fast maturing semiconductor with significant research effort invested in it all over the world during the past decade. ZnO is II-VI semiconductor materials that



Dr. K. SenthilKannan B.Sc., M.Sc., M.Phil., SLET, Ph.D., in Physics got Goldmedal in M.Sc Degree. He has also completed M.B.A., PGDCA., B.Ed., C.I., M.A., D.C.A., and D.C.H. He is having 19+ years of experience in Teaching and 10+ years of research experience. He has published 88 papers in International Journals, 1 paper in National Journal and communicated 25+ papers in International / National Journals. He has presented 152+ papers in National and International level Conferences, Seminars... during his academic career. He has completed his Ph.D

degree with Highly Commended recommendation. He has presented more than twenty five papers as an 'Invited talk'. He acted as a resource person for student's projects. He got the Best Paper awards in Conferences. He has published 10 books in his academic career. He has guided more than 100+ Students Projects in his academic extent and also he has given more than 10000 academic lectures in physical sciences. He is the Life time member for many associations. He is the Journal Reviewer/Editorial Member for 34+ Journals of International repute. He is the visiting Faculty at many Engineering Colleges. He has organised 16 National & International events. He has guided 62 M.Sc and 10 M.Phil Scholars and guiding Research scholars. *Presently* Professor of Physics, Dean/Director Research & Vice-Principal & Research Scientist at Edayathangudy G S Pillay Arts and Science College Nagapattinam TN India 611002. He Visited many countries for job as well as for Conferences. He received BEST DEAN R&D, BEST VICE PRINCIPAL, BEST INDIAN EDUCATIONIST, BEST ACADEMICIAN AWARDS and also Global SCIENTIST AWARD from Malaysia for his outstanding contributions to academics and research.

Published By :



ANU BOOKS

New Delhi • Meerut • Glasgow (UK)

E-mail : anubooks123@gmail.com

Website : www.anubooks.com

Phone : 0121-2657362, Mob. : 99978 47837 (India)

+44 758 651 3591 (UK)

2018

ISBN : 978-93-87922-44-0



9 789387 922440

₹ 700/-

Progress in Chemical Science Research

Vol. 8

Edited by Prof. Syed A. A. Rizvi



B P International

Contents

About The Editor	i
Preface	ii
Chapter 1	1-37
Study About Fe-TiO₂/AC and Co-TiO₂/AC Composites Prepared from Waste Streams for an Efficient Removal and Photocatalytic Degradation of Cibacron Yellow F-4G Dye	
Roberto Machado Garcia, Robert Carleer, Maria Arada Pérez, Jeamichel Puente Torres, Ying Gu, Pieter Samyn and Jan Yperman	
Chapter 2	38-45
Determination of Physicochemical Properties and Fatty Acid Composition of <i>Tamarindus indica</i> Seeds Oil	
A. E. Adeleke, A. P. Onifade, A. A. Adegbite, A. A. Sangoremi and O. E. Isola	
Chapter 3	46-95
Novel Coordination Compounds of Pterin Ligands Including a Redox Amphoteric W(IV)-pterin Complex: The Redox Chemistry Associated with their Formation and Reactivities	
Samir Sen, Siddhartha S. Baisya and Parag S. Roy	
Chapter 4	96-116
Core-shell Media: A Trendsetter in LC Separation	
R. Vijayalakshmi, V. D. Sundar, N. Appala Raju and S. Princely E. Gnanakani	
Chapter 5	117-130
Charge-discharge Processes of Zn-In and Zn-Sb Alloys in an Alkaline Medium for Batteries Application: A Comparative Study	
Hoda A. El-Shafy Shilkamy, Mahmoud Elrouby and A. Elsayed	
Chapter 6	131-143
Pd (II) Complexes with Schiff Bases: Synthesis, Spectral Characterization, and X-Ray Diffraction Studies	
Julekha A. Shaikh	
Chapter 7	144-163
Study on the Efficiency of Biomedical and Degradation of Dye through CuO Nanoparticles Synthesized at Various Molar Concentrations	
B. Arunkumar, S. Johnson Jeyakumar and M. Jothibas	
Chapter 8	164-172
Phenoplastic Potentials of Cocoyam Species Exposed to Selected Environmental Stressors	
Florence O. Ajah, Julian O. Osuji and Geoffrey O. Anoliefo	

Study on the Efficiency of Biomedical and Degradation of Dye through CuO Nanoparticles Synthesized at Various Molar Concentrations

B. Arunkumar ^{a*}, S. Johnson Jeyakumar ^b and M. Jothibas ^b

DOI: 10.9734/bpi/pcsr/v8/19160D

ABSTRACT

CuO nanoparticles synthesized by different molarities like 0.1, 0.2 and 0.3M at calcinations temperature 500°C. The CuO is heavily convertible metal oxide by its attractive properties. The XRD analysis revealed significant peaks related to the monocrystalline nature of CuO nanoparticles, and the average crystalline size of CuO nanoparticles is smaller as the molarities increase (23-19 nm). CuO nanoparticles may be seen in the SEM image to be well distributed, well linked, and compatible with the crystal system. There was a high cultural character. The blue shift in the absorption spectrum can be due to the CuO nanostructures' tiny size. CuO nanoparticles in the monoclinic phase are identified by FTIR spectra as having a band of characteristics with high intensity broad band peaks at 496.96 cm⁻¹. The synthesis of CuO nanoparticles was calcined temperature at 500°C, the particle size of the nanoparticles was found to be in the range of 23–19 nm. These sizes of integrated CuO NPs is a cost-efficient, biological molecule capable of working with antibiotics against gram positive and gram negative bacteria's like *Staphylococcus saprophyticus*, *Bacillus subtilis*, *Pseudomonas aeruginosa* and *Escherichia coli*.

Keywords: CuO; Sol-gel method; nanoparticles; morphological; photocatalytic and antibacterial activity.

1. INTRODUCTION

CuO is a highly convertible metal oxide due to its attractive properties. It is employed in a variety of technological applications, including lighting, gas sensors, high temperature, and tropical conditions [1]. It is being utilized as an

^a Department of Science and Humanities, Sir Issac Newton College of Engineering and Technology, Pappakovil, Nagapattinam 611102, Tamilnadu, India

^b Department of Physics, T B M L College, Porayar-609307, Tamilnadu, India

*Corresponding author. E-mail: bvarun2030@gmail.com.

London Tarakeswar

Registered offices

India: Guest House Road, Street no - 1/6, Hooghly, West Bengal, India,
Corp. Firm Registration Number: L77527,
Tele: +91 7439016438 | +91 9748770553, Email: director@bookpi.org,
(Headquarters)

UK: 27 Old Gloucester Street London WC1N 3AX, UK
Fax: +44 20-3031-1429, Email: director@bookpi.org,
(Branch office)

Dr. S. Mohammed Mumtaj Begum is currently the Head, Department of English, Avvaayar Govt. College for Women, Karakkal, Pudukkottai. She has more than 26 years of teaching and her specialization includes American Drama, Post-Colonial Writings and Feminist Writings. She has participated in National and International conferences and has published nationally.

Dr. Shiv Kumar has completed B.A. (Hons.) and M.A. English from University of Delhi. He worked on Ageing for his M.Phil. from Jamia Millia Islamia New Delhi and received his doctorate degree from Jamia Millia Islamia on Dalit Autobiographies. He has presented papers in national and international seminar and published on the issue of Dalit. He also has a teaching experience of 8 years in University of Delhi, Ambedkar University of Delhi and Jamia Millia Islamia.

VOICES FROM THE MARGINS

A Diverse Understanding of Margins and Marginality



AUTHORS PRESS
Publishers of Creative & Scholarly Books



ISBN 978-93-89824-26-1
9 789389 824261
₹ 995 | \$ 50

VOICES FROM THE MARGINS

A Diverse Understanding of Margins and Marginality

Edited by
S. Mohamed Mumtaj Begam
Shiv Kumar



VOICES FROM THE MARGINS

A Diverse Understanding
of Margins and Marginality

Edited by

S. Mohamed Mumtaj Begam
Shiv Kumar

Dutt, Palme. *The problem of India*. New York: International Publishers, 1943, p.34.

Gandhi, M.K. *An Autobiography of The story of my experiments with truth*. Trans by Mahadev Desai, 2nd ed., Navjivan Publishing House, Ahmedabad, 1959.

..... *The Problem of Education*. Navjivan Publishing House, Ahmedabad, 1962, p 45.

Gandhi, M.K. *To the students*. Navjivan Publishing House, Ahmedabad, 1949, p. 32-33.

Dimensions of Marginalisation in Mahasweta Devi's *Breast-giver*

E. Benhur Arunodhayam

Abstract

To understand the social discrimination in the Indian context is to understand the complex pattern that prevails within the society. One's status and respect is earned through the hard work or by any other means of necessity. Sometimes money becomes an empowering agent irrespective of the social discrimination. The economical status of an individual plays a role in defining subalternity. The word 'subaltern', literally means a 'military officer of inferior rank'. It has acquired immense significance in post-colonial literary theory ever since the Italian Marxist critic Antonio Gramsci has used the term in his *The Prison Notebooks*. It is said by Ranjit Guha in his Preface to *Subaltern Studies* (Vol. I) that subaltern "... is a name for the general attribute of subordination in South-Asian society... expressed in terms of class, caste, gender,... or any other way" (Guha, vii). Another term that is synonymously used with subaltern is 'Dalit'. However these two terms have a subtle difference when one understands the nature of marginalisation. Both the terms refer to a group of people who occupy a space that is marginal in its relation to the centre of power. Jashoda in the short story *Breast-giver* has Brahminical identity but the identity is not sufficient to run her life. The hardships that she experiences bring to light the other dimension in marginalisation. This paper proposes to make critical study of Mahasweta Devi's short story *Breast-giver* to show how an individual is oppressed in the class divided society.

Key words: Subaltern, Dimension, Oppression

8. Political Parrhesia: Subverting the Logics of Protection in Malalai Joyas's *Raising My Voice*
Dr. R. Kamini 71
9. Revelation of Resistance and Race Consciousness through Reflectivity in Alice Walker's *Everyday Use*
Dr. Akilandeshwari Srinivasan 80
10. 'Submissive to Strong and Sublime' – Changing Colours of Mariam's Primal Trait in Khaled Hosseini's *A Thousand Splendid Suns*
R. Nappinnai 90
11. Emerging Self: A Reading of Tahmima Anam's *A Golden Age*
Dr. S. Padmavathy 97
12. Silence and Invisibility as Resistance in Guillermo del Toro's *The Shape of Water*
Nikita Pinto 103
13. A Candid Account of a Self-Nurtured Woman
Arunima Bajju 112
14. A Glance behind the Mask: Trauma of V in Alan Moore's *V for Vendetta*
Amrutha S. L. and Rachana S. Pillai 126
15. Transgression of Love: A Comparative Study of *The Scarlet Letter* and *Chenmmeen*
T. T. Lasitha 135
16. Children, Dolls and Ghosts: Analysing the Logic of Liminality in Horror Fiction
Heba Thankam Varghese and Ashish Manohar 143
17. Development of Self-Regulation: A Review of Selected Case Studies in Present Scenario
A. Radhika 152
18. Psychologically Affected People are the Most Marginalised: Supportive Ideas from Literature
N.Nalina 163
19. Tawaifs: Women Possessing a Prowess for Art
Agrima Mishra 169
20. Institutionalism of Prostituted Women: A Close Reading of Select Indian Short Stories from Ruchira Gupta's Anthology *River of Flesh and Other Stories*
Rashmi Bhura 179
21. Personality of Woman beyond Religion in Rabindranath Tagore's *The Story of a Muslim Woman*
David Paul. S 186
22. Capturing the Character of Sangeeta Chainani and the World of Academia in Shakuntala Bharvani's *Lost Directions*
Anuradha Singh 194
23. Dimensions of Marginalisation in Mahasweta Devi's *Breast-giver*
E. Benhur Arunodhayam 201
24. Mahesweta Devi's *Rudali*: A Saga of Collective Empowerment
Dr. K. Camalane 207
25. The Concept of Revisioning in Mahasweta Devi's Short Stories *Draupadi* and *Breast Giver*
Thiruvardini K. 213
26. Recognition of Muteness and Assertion of Self-Voice in Anita Nair's *Ladies Coupe*
Krishna R. Nair 218
27. Rejecting the Concept of "New Woman": Reading K. Saraswathi Amma
Bhagyalakshmi Mohan 223
28. Gender Marginalisation: A Study of Arunthathi Roy's *The God of Small Things* and Shashi Deshpande's *That Long Silence*
Dr. S. Mohamed Mumtaj Begam 230

QUESTIONING THE CANON: VOICES FROM THE MARGINS

TECHNOLOGY LEARNING IN CONTEMPORARY WORLD



Editor

Dr. R.UDHAYA MOHAN BABU

TECHNOLOGY LEARNING IN CONTEMPORARY WORLD

Dr. R. Udhaya Mohan Babu

Former Assistant Professor

Sri Raja Rajan College of Education for Women
Karakudi.



Krishna Publication House
Gujarat

CONTENTS

1. **Impact on E-Learning in Teaching Learning Process**
P. Mohanram & Dr. C. Manoharan1
2. **Challenges in the use of Mobile Devices in Classroom Learning**
B. Hemavathi & Depuru Bharathi8
3. **E - Learning and its uses in Educational Sectors**
Dr. G. Sheela Edward19
4. **Effective Methods of Teaching and Learning after COVID-19**
Anil Kumar30
5. **E-Learning Pre-Eminent Digital Connectivity in 21st Century**
Manisha Kakkar40
6. **Digital Tools to Enrich our Virtual Classroom for Innovative Teachers & Students**
Dr Bilal Ahmad Bhat50
7. **A Study on Digital Education**
Dr. Meena Wadgule59
8. **Paradigm Shift in Learning-blended Learning in Indian Context**
Mrs. Sunindita Pan69
9. **Blended Learning - The Future Learning**
Gurjot Kaur75
10. **The Impact of Smart Boards in Enhancing Learning and Teaching**
K. S. Shanthi Sree & Prof. D. Bharathi82
11. **Importance of E-learning Environments in Teaching Learning Process**
B. Hemavathi & Depuru Bharathi92

CONTENTS

12. **Technology Learning for Next Generation Digital Learning**
Dr. Jadhav Surekha Girdharilal &
Miss. Jadhav Reena Girdharilal102
13. **Enhancement of Learning Through Cognitive Technologies**
Dr. P. PandiaVadivu & Ms. K. Sowmiya109
14. **Digital Doctrina : A Swift from Conventional Learning to
Virtual Learning**
Deepthi George & Amritha Alphy Jose116
15. **Role of Technology to Identification of Historical Events**
R. Ambika122
16. **Creative Teaching Through Technology in Current Scenario**
T. Muthukumar125
17. **Attitude Towards Information and Communication
Technology (ICT) Among the Higher Secondary Students
Level in Manapparai Taluk**
Dr. N. Allimuthu 129

Scoring and Consolidation of Data

Scoring of the response sheets were done as per the scoring scheme. The scores obtained in all questionnaires along with the personal data are consolidated and tabulated on consolidation sheet for the purpose of analysis. Each subject was given a specific number, the data concerned with the teachers was entered in the specific line, following a specific order.

Reliability of the Tool

The tools were administered to a group of 200 higher secondary students in Manapparai taluk and the score were computed.

Validity of the Tool:

This can be done through a representative collection of items and a sensible method of test construction.

Population of the Study

Population of the study the investigator decided to collect data from higher secondary students in colleges of the 7 higher secondary schools at Manapparai Taluk. There are 200 higher secondary students are the sample of this study.

Sample for the Study

The investigator selected 200 samples have been collected from higher secondary students for the study, by using Random sampling Techniques.

Statistical Techniques Used

The following statistical techniques were used in the study

Mean, Standard Deviation, 't' test for determining the significance of difference between means of two - sub groups, 'F' test to find out the significance of difference between more than two groups.

Analysis and Interpretation of Data

Hypotheses Testing

1. There is no significant difference between the mean scores of attitude towards ICT among the higher secondary student on the basis of total value, Gender, locality of student and locality of school.

Table - 1

Attitude towards ICT among the higher secondary student on the basis of total value, Gender, locality of student and locality of school.

Sl. No	Categorie s	Variable s	N	calculate d value	Table value at 0.05	Result
1	Total value	Valid	200	79.57	12.765	students have adequate knowledge in ICT
2	Gender	Male	72	79.64	0.073	NS
		Female	128	79.50		
3.	Locality of the Student	Rural	170	79.49	0.14	NS
		Urban	30	79.83		
4.	Locality of the School	Rural	145	81.12	3.04	S
		Urban	55	75.51		

Since the calculated value is greater than the table value (1.98) at 0.05 level of significance, there is no significant difference between the attitude towards ICT among the Higher secondary student on the basis of total value, Gender, locality of student and there is a significant difference between the attitude towards ICT among the Higher secondary student on the basis of locality of school. Hence the hypotheses 1, 2, 3, are accepted and 4 are not accepted.

Major Findings of the Study

The findings arrived from the present study are listed here under

The Higher secondary student have attitude towards ICT is moderate. There is no significant difference between the mean scores attitude toward ICT among the Higher secondary student on the basis of gender and locality of students. There is a significant difference

between the mean scores of attitude towards ICT among the Higher secondary student on the basis of locality of school.

Educational Implication

The result of the present study implied that there was adequate knowledge in ICT among Higher secondary students. It plays a dominant role in all walks of human life. So, it is necessary to know about them in details. ICT opens a window into the world of technology. It will also open new avenue of employment, either self or external agency based. ICT plays a vital role in education. So today, Higher secondary student are using the Technology in their subject and they want to improve their knowledge in ICT while learning.

Conclusion

The present study has investigated the Attitude Towards Information and Communication Technology among Higher secondary student level in Manapparai Taluk. The government should give more funds, for the establishment of ICT programme and more special training programme has to be conducted, to give hands-on-training in operating technologies and other widely used application software to the higher secondary students. Hence, in this way ICT can be profitably used in classroom teaching to make the teaching-learning process more effective in the school.

Reference

1. Karpaga Kumaravel, R., (2002) Integrating Technology into Teaching and Learning Conference papers Vol. I, Society for Edu. Tech, Research and Journals Development, Tiruchirappalli.
2. Anjali Pahad and Avani Maniar (2002). Integrating ICT in Teacher Education. A case study National Conference On Technology Vs Teacher, (CASE) Centre for Advanced Studies in Education, M.S. University, Baroda.
3. Sahoo, P.K., Dhananjai Yadav (2001). University and College Teacher Perception on Future Perspectives of ICT in Education. (CASE) Centre for Advanced Studies in Education, M.S. University, Baroda.

The editor Dr. R. Udhaya Mohan Babu was worked as an Assistant Professor of Sri Raaja Raajan College of Education for Women, Karaikudi, Sivagangai District. He pursued his M.Sc., in Presidency College Chennai and completed his M.Ed., Ph.D., from Alagappa University, Karaikudi. His research areas of specialization are Teacher Education, Cognitive Science, and Educational Technology. He has published research articles in Scopus index International journals, book chapters in books and seminar proceedings. He has presented many papers in the National and International Research Conferences, Seminars and symposium. He Visited the Faculty of Education, University of Malaya, Malaysia & Faculty of Humanities, Ruhuna University, Matara, Sri Lanka.

Published and Printed by



Krishna Publication House

No. 303, YashKunj Apartment,

Devbaug, Anantwadi, Bhavnagar, Gujarat-364002

E-mail: krishnapublication62@gmail.com

Web: www.krishnapublicationhouse.com

ISBN : 978-81-94320-57-1




9 788194 320571



VALIANT INDIAN WARRIORS

**Philosophies, Approaches
And Victories**

Edited by
**Prof. (Dr.) C. B. Bhange
Devidas Vijay Bhosale**

 **Bharti**

Valiant Indian Warriors

Philosophies, Approaches, and Victories

Edited by

Prof. (Dr.) C. B. Bhangé

*Professor and HOD, Dept. of Military Science
Shri Shivaji College Pharbhani, Maharashtra*

Devidas Vijay Bhosale

*Assistant Professor and HOD,
Department of Defence and Strategic Studies
Tuljaram Chaturchand College Baramati, Maharashtra*



Bharti Publications
New Delhi-110002 (India)

CONTENTS

<i>Preface</i>	iii
1. Field Marshal; K. M. Cariappa <i>Major Sanjay Choudhary</i>	1-2
2. Kautilya the Great Political Philosopher <i>Dr. Ram Pandurang Sabade</i>	3-5
3. Kautilya's thought on Good Governance <i>Dr. Ranjana A. Shringarpure</i>	6-9
4. Chandragupta Maurya: A Brave Warrior <i>Mangesh B. Kulkarni</i>	10-14
5. Raja Raja Chola I: A Great Warrior <i>Dr. G. Sheela Edward</i>	15-21
6. Role of Rana Kumbha in Indian Nationalism <i>Dr. B. C. Joshi and Richa Tiwari</i>	22-23
7. The Tiger of Mysore (Major Military Huddle for East India Company in South India Campaing) <i>Mohammad Yusuf</i>	24-36
8. A Comparative Study of Shivaji's Administrative System in the Present Perspective: The Great Freedom Warrior <i>Dr. Amita Joshi</i>	37-40
9. The Great Maratha Warrior-Chhatrapati Shivaji Maharaj: A Study on their Social Point of View <i>Prof. (Dr.) Shivaji Mansingrao Kendre</i>	41-46

10. Role of Shivaji Maharaj in Environment Conservation 47-55
Sandipen Babasaheb Jige
11. Shivaji Maharajas thoughts and its Relevance to Modern Era 56-59
*Dr. Chandrakant Bansiadar Bhange,
Devadas Vijay Bhosale and Amol Popat Lokhande*
12. Contribution in Social Sector by Rajashri Shahu Maharaj 60-65
Dr. Kailas Dnyanoba Sarant
13. Rajarshi Shahu Maharaj A Democratic King 66-74
Dr. Sumita Sanjay Dhapte
14. Sevalal Maharaj is a Brave Warrior and Social Reformer 75-82
Dr. Datta Uditkar Jadhav
15. Bakshi Jagabandhu: A Synonym of Valour and Bravery 83-92
Dr. Pravat Kumar Das
16. Yashwantrao Holkar 93-95
*Dr. Priyanka Mahavir Hake and
Dr. Pranav Mahavir Hake*
17. The Warrior Son of Karnataka: Krantiveera Sangolli Rayanna (15 August 1796-26 January 1831) 96-99
Dr. Vasudha N
18. The Taty Top: A Great Revolutionary Warrior of the Motherland 100-104
Dr. Shikha Srivastava

19. Maharani Lakshmi Bai: A Warrior Queen of India 105-109
Kausar Ansari
20. Tantya Bhil: The Indian Robin Hood 110-115
Dr. Rajvirendrasing Rubji Gavit
21. Umesh Chandra Dutta: An Unsung Social Warrior of Bengali Renaissance 116-120
Prabodh Mandal
22. A Journey to Eternal Spirituality 121-127
Dr. Partha Biswas and Dr. Ruchika Singla
23. Birsa Munda: An Unsung Tribal Valiant Warrior 128-132
Amit Kumar Das
24. Bir Birsa Munda: A Story of Bravery of the Tribal Warrior of India 133-138
Saraj Lama
25. Birsa Munda: An Indelible Tribal Leader 139-145
Baruna Kumar Behera
26. Indomitable Birsa Munda: A Review 146-155
Dr. Kartick Chandra Barman
27. Chittagong Uprising of 1930 156-160
Mt Fotema Khatun
28. Contribution of Pandit Jawaharlal Nehru to Indian Politics: A Critical Study 161-167
Akash Sheshrao Bangar

About the Editors



Prof. (Dr.) C. B. Bhange is currently Professor and HOD, Department of Military Science at MSP Mandal's Shri Shivaji College, Parbhani, Maharashtra. He did Post Graduation in 1997 from University of Pune, Ph.D. in 2003 from University of Pune and Qualified SET Exam in 1998. Dr. Bhange is also Chairman of Board of Studies (BOS) in Military Science, SRTMU Nanded, Member Academic Council, SRTMU, Nanded and Member of Board of Studies (BOS) in Military Science, Dr. BAMU Aurangabad. He achieved and Honors

with various award like Late Dnyandeo Mohekar Paritoshak B.A III, 1995, The Vishwanath Parvati Gokhale Trust Fund Prize in Military Science, April/May 1997, Shri Datta Prasanna Katdare Paritoshik in Defence Studies, Late General Arun Kumar Vaidya Paritoshik, and Late Maj. Gen. Y.S. Paranjape Paritoshik etc. Dr. Bhange participated and attended in various national and international seminars, conferences and webinar. He has edited more than 20 books and more the 50 chapters published in National and International journals and in edited book. Dr. Bhange is Research Guide at various universities and at present 04 research students in Swami Ramanand Teerth Marathwada University Nanded, and 02 research students Shri Jagdish Prasad Jhabarmal Tibrewala University Rajasthan are doing research work under his guidance.



Mr. Devidas Vijay Bhosale, M.A. NET, PhD (Pursuing), Currently working as assistant professor and head at Dept. of Defence and strategic Studies, Tuljaram Chaturchand College Baramati. He is pursuing PhD from SRTMU Nanded. Devidas is author of 2 books and editor of 3 edited books. Devidas has participated in many international conference, national conference, webinars, seminars, and many other research works. Apart from this Devidas has earned various national and international certification like NET = National Eligibility Test (DSS), MCSA = Microsoft

Certified System Administrator, CPTS = Certified Penetration Testing Specialist, MCIEP = Microsoft Certified Innovative Educator Program and NCC B and C certificates. Devidas is member of various academic bodies as follows Chairman Board of Studies Defence and Strategic Studies Tuljaram Chaturchand College Baramati (Autonomous), Member Syllabus Formation Committee Dahivadi College Dahivadi affiliated to Shivaji University Kolhapur, Member Editorial Board of Revista Review Index Journal of Multidisciplinary (RRJM), Member of Institute for Security and Development Studies (ISDS).



Bharti Publications, New Delhi

E-mail: info@bhartipublications.com • bhartipublications@gmail.com

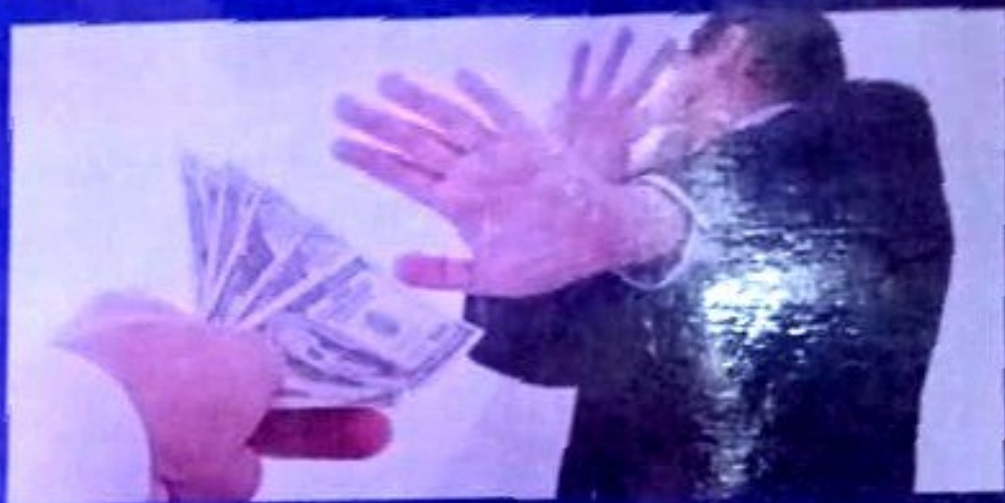
www.bhartipublications.com

ISBN 978-83-90818-06-3



Price- Rs. 600/-

**CORRUPTION:
AS AN OBSTACLE
TOWARDS DEVELOPMENT**



Dr. Punya Shailaja



Published by
Dosh Vikas Publications

**Corruption: As an Obstacle
Towards Development**

**Edited By
Dr. Punya Shailaja**

1527-8564
E251

2348-1269
I7RAR

CONTENTS

Chapter	Chapter Title/ Author	Page No.
UNIT - 1		
Corruption & Anti Corruption		
01	Anti corruption Legal Regulations in India: An overview with reference to Public Officers Dr. Anisa Shaikh	1-9
02	Working of the Lokpal in India: Some Reflections Dr. B. H. Satyanarayana	10-15
03	Anti - Corruption Insights in Tamil Literature: With special reference to Thirukkural Dr. R. Venkatesh	16-24
04	Legislative and Regulatory Framework in Eradicating Corruption Dr. Bhaskar Vempati	25-32
05	A Study on working of Telangana State Anti Corruption Bureau R. Uma Rani	33-47
06	A Study on Lok Ayuktha System in India : An Appraisal Dr. Balabrahma Chary	48-56
UNIT-2		
TRANSPARENCY AND ACCOUNTABILITY		
07	The Role of Indian Policies in Preventing Corruption Dr. Shrikant Nityanath	57-64

08	Land Record System in India- Understanding Inadequacies through case of Visakhapatnam, Andhra Pradesh	65-75
	Ms. Vallary Gupta	
09	Anti -Corruption and Transparency Measures in India	76-84
	Ms. Manpreet Kaur	
10	A Study on Relevance of Transparency and Accountability	85-91
	Naveena Grape Kumari	
11	A Study on Anti Corruption and Transparency in India	92-101
	Shikha Dubey	
12	Anti Corruption and Transparency Measure in India	102-110
	Dr. G. Sheela Edward	

UNIT-3 COMBATING CORRUPTION

13	Need to Fight Corruption in India and Laws available to Curb It	111-118
	Dr. K. Sangeetha	
14	A Study on Role of Education in Combating Corruption	119-127
	Dr. D. Rambabu	
15	The use of ICT Interventions to Combat Corruption and Improves Public Service Delivery in India	128-137
	Dr. L. Thirupathi	

UNIT-4 CORRUPTION - AN OBSTACLE

16	Barrier to Development: Corruption in India	138-147
	B. Chandra Shekar	
17	Corruption - Causes and Effects on Economy	148-155
	Dr. P. Rengarajan	
18	Corruption As an Obstacle towards National Building	156-162
	Suman Tamang & Biswajit Barman	

UNIT-5 ROLE OF TECHNOLOGY IN ERADICATING CORRUPTION

19	Impact of Good Governance in Eradicating Corruption	163-172
	Rameshwaramma	
20	A study on Technology in eradicating Corruption	173-182
	R. Raj Kumar,	
21	Role of Technology Towards Eradicating Corruption	183-189
	Dr. Ashok Kumar Kolluru	

UNIT-6 RTI ACT ROLE IN ERADICATING CORRUPTION

22	Impact of RTI on Corruption in Banking system	190-201
	K. Narasaraj & O. Sharada	
23	Right to Information Act: Impact on Corruption - A Review	202-206
	Dr. Sharad Kumar Singhariya	

24	Impact of Technology and RTI Act in Eradicating Corruption	207-215
	Dr. Srinivasa Padmakar Sivalanka	

UNIT-7
CORRUPTION IMPACT AND CONSEQUENCES

25	Corruption and Its Consequences in India	216-223
	Dr. Vinod Kumar Cherukuri	
26	A Study on Corruption in India: Causes and Consequences	224-233
	Dr. Purva Shailaja	
27	Role of Judiciary System and its Consequences on Corruption	234-242
	Harpisad Dode	
28	A Study on Corruption and its Impact in Indian Society: Causes and Remedies	243-252
	Dr. Kandula Govindu	

1

Anticorruption Legal Regulations in India: An Overview With Reference To Public Officers

Dr. Anisa Shaikh

*Assistant Professor, Department of Law,
Bharati Vidyapeeth (Deemed to be) University, New Law College, Pune,
Maharashtra, India. Email: shaikhag.1981@gmail.com*

ABSTRACT

The corruption and bribery progressively used by society for their benefits so it has extended in large rate. Corruption is an issue that numerous administrations have needed to battle through the ages; it is something that will probably consistently exist. There are no specific laws or statute to regulate private corruption matters in India. It is generally punished under Indian penal Code with general provisions or under specific statutes like Indian Contract Act and Companies Act. All the laws focus on public officials. India has adopted certain statutes for combating issue of corruption. The Prevention of Corruption Act is the prime Act to deal with corruption by Public officials in government organisation and public sectors. All the laws focus on public officials. We need to have strong measures to curb practice of corruption because corruption-the result of unholy alliance between Politicians, Bureaucrats, People with muscle power, and Businessmen. The laws are plenty to tackle corruption but in order to deal with this issue we need to have effective implementation machinery with strong political will.

Key words: *Corruption, Prevention, Public Servant, gratification, Money Laundering, Vigilance, Right to Information, Whistle Blowers, Lokpal and Lokayuktas*

1.0. Introduction

Corruption is seen as unethical practice since the ages. The word corruption is not defined in Act. Corruption is not new to Indian Society because since the ancient times the nation had been managed by organization with ministers, officials, clergymen and other managerial officers. The corruption and bribery progressively used by society for their benefits so it has extended in large rate. There were different forms of punishments inflicted

WORLD POLITICS IN 21ST CENTURY



Edited by
Prof. (Dr.) C. B. Bhange
Dr. Santhosh Mathew
Ajay Kumar | Arbind Kumar

 **Bharti**

World Politics in 21st Century

Editors

Prof. (Dr.) C. B. Bhange, Dr. Santhosh Mathew
Ajay Kumar, Arbind Kumar



Bharti Publications
New Delhi-110002 (India)

CONTENTS

<i>Preface</i>	iii
<i>Acknowledgement</i>	v
1. Impact of Third World Countries on Global Politics <i>Baruna Kumar Behera</i>	1-5
2. Peace and Conflicts in South Asia <i>Prof. Dr. C. B. Bhange, Ajay Kumar and Arbind Kumar</i>	6-9
3. Existing Structural Adjustment Programs Sponsoring Obstacles for South Asian Countries Attaining SDG Goals <i>Dr. Santhosh Mathew</i>	10-23
4. Elements Involved in Political Globalization <i>Prof. Nirmal E.S.</i>	24-28
5. China's Grand Strategy to be A Great Power: A Study of Capabilities and Constraints <i>Vishakha Jha</i>	29-36
6. China-US Trade War. A Shift towards South Asia <i>Adil Qayoom Mallah and Waseem Ahmad Bhat</i>	37-46
7. Russia-Central Asia Relations through the Lens of the Shanghai Cooperation Organization <i>Amit</i>	47-52
8. The Relationship between USA and Russia in the Trump Era <i>Dr. G. Sheela Edward</i>	53-59
9. Economic Relations Between the United States and the European Union in a Changing World Scenario: Actors, Factors and Dynamics <i>Dr. Pravat Kumar Dash</i>	60-71

- | | |
|--|---------|
| 10. Diplomacy as Driver of International Relations:
Transforming Ties
<i>Suman Hati</i> | 72-79 |
| 11. Disarmament Need and Challenges
<i>Dr. Alpana Sharma</i> | 80-87 |
| 12. Role of India as Nuclear State on Disarmament
<i>Priya Das</i> | 88-95 |
| 13. The Study of Disarmament and the Peace
Movement
<i>Aakash Sheshrao Bangar</i> | 96-105 |
| 14. International Law and Cyberwar
<i>Srijata Charan</i> | 106-110 |
| 15. Cyber Terrorism and Cyber Crime: A New Threat
for the World
<i>Soheli Naik</i> | 111-123 |
| 16. Climate Change in the Changing Global
Environmental Perspective
<i>Rajesh Kumar Sinha</i> | 124-129 |
| 17. Burning Problem of Present India: Terrorism,
Naxalism, Provincialism, Linguistics
<i>Dr. Aditi Goswami</i> | 130-136 |
| 18. The Impact of the Current Pandemic on the World
System and its New Born Challenges to the
People of the Entire World
<i>Srujan Lama</i> | 137-142 |

1

Impact of Third World Countries on Global Politics

Bazuna Kumar Behera¹

Introduction

The so called "Third World Countries" emerged in the post World War- II period, when the world was divided into two opposite camps under the power politics of Cold War. During this period, the process of De-Colonization was at its zenith as a result of which many Asian & African countries got independence from foreign yokes and they joined the international community as sovereign entities. These newly born independent countries had their own political, social and economic challenges such as poverty, unemployment, backward economic situation etc. To overcome such problems, independence in economic area/domain was imperative, which could provide safety/cover to their hard earned political independence. Third world countries were aware of the fact that without economic independence, political autonomy could not be ensured in international politics. Therefore third world countries had decided to remain away from cold war power politics and to pursue their own strategy of development. This type of thinking set the stage for the launch of Non Alignment Movement (NAM) in world politics. According to Morton Kaplan, emergence of the third world countries in world politics played an important role as they transformed the Bi-Polar world order into Loose Bi-Polar world

¹ Assistant Professor in Political Science, Khallikote Autonomous College, Berhampur, Ganjam, Odisha

About the Editors

Prof. (Dr.) C. B. Bhange is currently Professor and HOD, Department of Military Science at MSP Mandal's Shri Shivaji College, Parbhani, Maharashtra. He did Post Graduation in 1997 from University of Pune, Ph.D. in 2003 from University of Pune and Qualified SET Exam in 1998. Dr. Bhange is also Chairman of Board of Studies (BOS) in Military Science, SRTMU Nanded, Member Academic Council, SRTMU, Nanded and Member of Board of Studies (BOS) in Military Science, Dr. BAMU Aurangabad. He achieved Honors with various award like Late Dnyandeo Mohekar Paritoshak B.A III, 1995, The Vishwanath Parvati Gokhale Trust Fund Prize in Military Science, April/May 1997, Shri Datta Prasanna Katdare Paritoshik in Defence Studies, Late General Arun Kumar Vaidya Paritoshik, and Late Maj. Gen. Y.S. Paranjape Paritoshik etc. Dr. Bhange participated and attended in various national and international seminars, conferences and webinar. He has edited more than 20 books and more the 50 chapters published in National and International journals and in edited book.

Dr. Santhosh Mathew did his Masters, M.phil, Ph.D in International Relations & Politics from Mahatma Gandhi University, Kottayam with Junior Research Fellowship (UGC). Currently Dr. Mathew serving as an Assistant Professor at Centre For South Asian Studies, Pondicherry Central University, Puducherry. He is the author of five books and presented research papers in national and international conferences, delivered invited lectures and has research papers published in reputed journals. His teaching and research interests include Contemporary international relations, comparative politics, political economy, Mass communication & media studies, international organisations, south Asia, foreign policy etc. He has also an additional Masters in Mass communication and journalism with UGC-JRF. He is a recipient of the Best teacher award from the Pondicherry University in Four consecutive years.

Mr. Ajay Kumar is currently completing his Post Graduation from Department of Political Science, DAV College, Abohar (Punjab). He graduated from Guru Nanak Khalsa College Abohar in the year 2018 and has passed the National Eligibility Test (UGC-NET) in the year 2019. He has also participated and presented papers at many national and international seminars & multiple webinars, conferences, FDP and workshops. He has published many research papers. At the same time, he is very interested in studying international relations, Indian politics and Marxism.

Mr. Arbind Kumar has worked as a Assistant Professor (Political Science) and Research Associate (Gandhian Study Center) at DAV College Abohar, Punjab. He received his bachelor's and master's degrees in political science. He has passed U.G.C. NET in July 2018 in Political science. He started working as Assistant Professor (Political science) in July 2019. He is interested in writing Articles and journals.



Bharti Publications, New Delhi

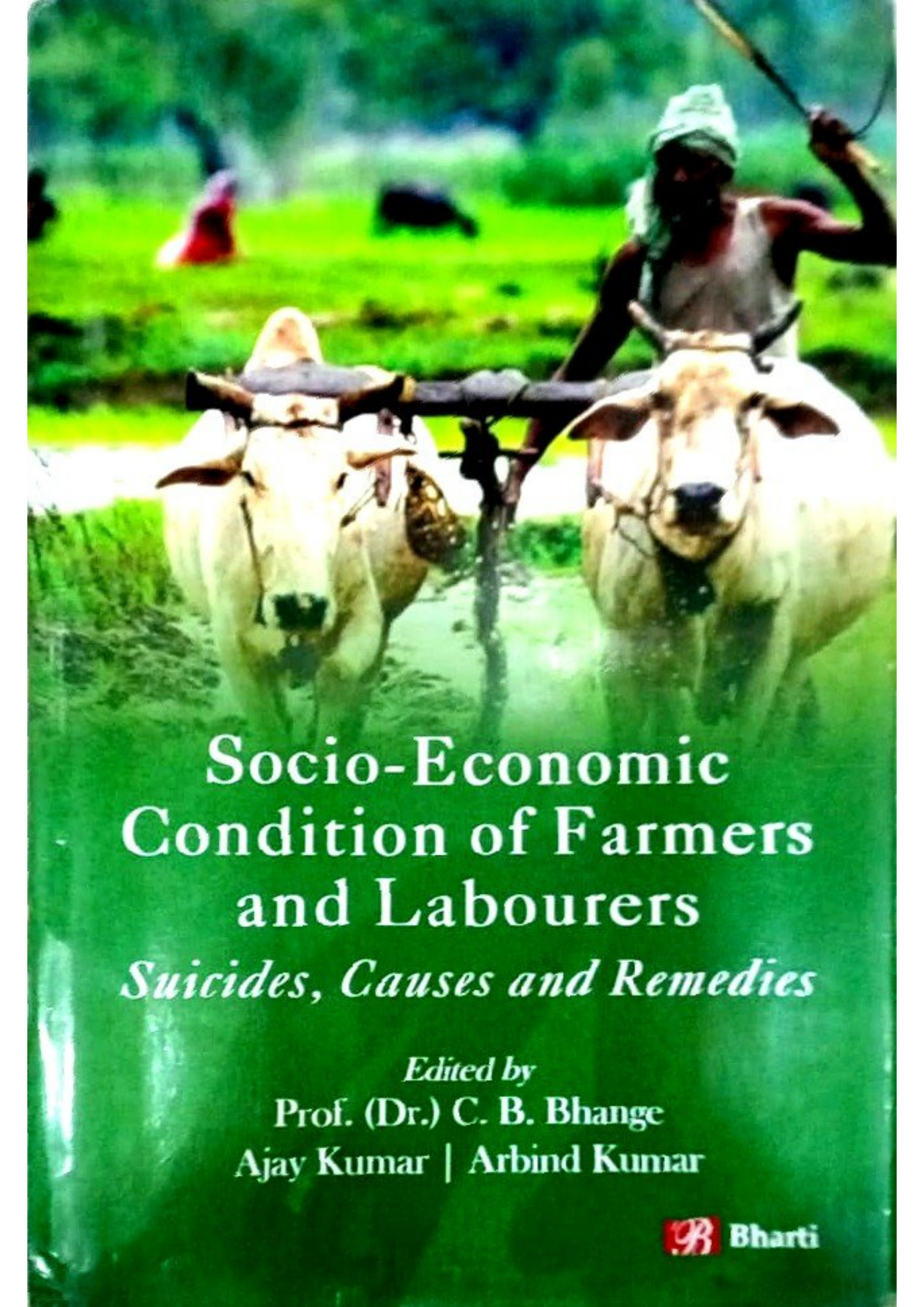
E-mail: info@bhartipublications.com • bhartipublications@gmail.com

www.bhartipublications.com

ISBN 978-81-9375-447-7



Price- Rs. 645/-

A photograph of a farmer wearing a white turban and a white tank top, guiding a pair of white oxen pulling a wooden plow through a green field. The background is a lush green landscape with trees and a small structure.

**Socio-Economic
Condition of Farmers
and Labourers**
Suicides, Causes and Remedies

Edited by
Prof. (Dr.) C. B. Bhange
Ajay Kumar | Arbind Kumar

**Socio-economic Condition of
Farmers and Labourers**
Suicides, Causes and Remedies

Edited by
Prof. Dr. C.B. Bhange
Ajay Kumar
Arbind Kumar



Bharti Publications
New Delhi-110002 (INDIA)

Contents

<i>Preface</i>	<i>iii-iv</i>
<i>Acknowledgment</i>	<i>v</i>

CHA PTER	PARTICULARS	PAGE NO.
1	Small Farmers in India: Challenges and Opportunities Dr. Sunita S. Dhopte	1-8
2	Land Reforms: The Task Ahead Dr. Pravat Kumar Dash	9-20
3	Revolutions and Innovations in Indian Agriculture: An Overview Sharad Kumar Singhariya	21-26
4	The Green Revolution in India: An Analysis Athokpam Marconi Singh	27-33
5	Advantages and Disadvantages of Green Revolution Jitender	34-38
6	A Theoretical Evaluation of Green Revolution Dr. Sreeja Mole S	39-46
7	Swaminathan Reports and its Importance in Agricultural Sector Dr. G. Sheela Edward	47-53
8	The Peasant Resistance and Revolt in Mysore during British Rule Shylaja G.1 & Shashikala A.S.	54-60

9	The Tebhaga Movement in Bengal (1946-1947) Quazi Nurul Hamim & Dr. Md Kamal Hossain	61-68
10	A Brief Historical Analysis of Naxalite Movement in India Santaj Lama	69-74
11	The Naxal Movement Nooraj Singh Manhas	75-91
12	Causes of Farmer's Suicide Md. Imdad Badar	92-98
13	Farmers' Suicides in India Memoorah Baig	99-103
14	Life as a Debt: Farmers' Suicide and the Challenges of Agricultural Scenario Ahana Choudhury	104-110
15	Causes for Farmer's Suicides in India R. Saritha	111-113
16	The Study for Causes and Remedies of Farmer Suicides Dr. Balasahab S. Pawar	114-119
17	Farmer's Suicide in Marathwada Region: A Study with Special Reference to Latur District Vijaykumar Ganpatrao Pawar	120-124
18	"Farmers Suicides Serious Problems in Maharashtra" Dr. Ram Pandurang Sahade	125-128
19	Farming Laws 2020 and the Protesting Farmers: Indian Farming at Crossroads Sovik Mukherjee	129-136

20	Three Farm Bills -A Reality Check Arnala Anna Alex	137-141
21	A Critical Study on the Three Farmer Bills 2020 C.A. Sathiya	142-146
22	Currently the Reality of three Farmers' Bills Prem Kishor Bera & Sumitra Sangwa	147-152
23	THE - PROLETARIAT Adv. Vaishnavi.A.Deshmukh	153-159
24	Karl Marx and the Working Class Deesha Khavnekar	160-166
25	Karl Marx on Working (Proletariat) Class Enamul Haque Molfick	167-172
26	Karl Marx and the Working Class Manpreet Kaur	173-180
27	Labor Movement in India: Issues and Challenges Dr. Manju Chandra	181-187
28	Assessment of 12.5% Scheme of Land Right in Raigad District Kavita Namdeo Ware	188-198
29	COVID 19 and its Impact on Farmer Surendra Prasad Yadav	199-202
30	Impact of India's New Farm Act, 2020 Farmers Prof. Dr. Shivaji Mansingrao Kendre	203-206
31	Need to Understand Indian Farming Issues Prof. Dr. C.B. Bhangre, Ajay Kumar & Arbind Kumar	207-212

Small Farmers in India: Challenges and Opportunities

Dr. Sunita S. Dhopte

HOD, Dept. of Sociology
Smt. Kesharbai Lalwoti Mahavidyalay Amravati
Maharashtra

1. INTRODUCTION AND BACKGROUND

Agriculture plays a pivotal role in the Indian economy. Although its contribution to gross domestic product (GDP) is now around one sixth, it provides employment to 56 per cent of the Indian workforce. Also, the forward and backward linkage effects of agriculture growth increase the incomes in the non-agriculture sector. The growth of some commercial crops has significant potential for promoting exports of agricultural commodities and bringing about faster development of agro-based industries. Thus agriculture not only contributes to overall growth of the economy but also reduces poverty by providing employment and food security to the majority of the population in the country and thus it is the most inclusive growth sectors of the Indian economy. The 12th Five Year Plan Approach Paper also indicates that agricultural development is an important component of faster, more inclusive sustainable growth approach. The structural reforms and stabilization policies introduced in India in 1991 initially focused on industry, tax reforms, foreign trade and investment, banking and capital markets. The economic reforms did not include any specific package specifically designed for agriculture. In the post reform (since 1991) period, India has done well in some indicators such as economic growth, exports, balance of payments, resilience to external shocks, service sector growth, significant accumulation of foreign exchange, information technology (IT) and stock market improvements in telecommunications etc. GDP growth was around 8 to

About the Editors



Prof. (Dr.) C. B. Bhange is currently Professor and HOD, Department of Military Science at MSF Mandar's Shri Shivaji College, Parbhani, Maharashtra. He did Post Graduation in 1977 from University of Pune, Ph.D. in 2003 from University of Pune and Qualified SET Exam in 1998. Dr. Bhange is also Chairman of Board of Studies (BOS) in Military Science, SRTMU Nanded, Member Academic Council, SRTMU, Nanded and Member of Board of Studies (BOS) in Military Science, Dr. BAMU Aurangabad. He achieved Honors with various award like Late Dnyandev Mohekar Paritoshak B.A III, 1995, The Vishwanath Parvati Gokhale Trust Pund Prize in Military Science, April/May 1997,

Shri Datta Prasanna Katdare Paritoshik in Defence Studies, Late General Arunkumar Vaidya Paritoshik, and Late Maj. Gen. Y.S. Paranjape Paritoshik etc. Dr. Bhange participated and attended in various national and international seminars, conferences and webinar. Various publications including in National and International journals and also contributed more than 50 chapters in edited book. He has also joined as a resource person in various National and International webinars. More than six students doing research under his guidance.



Mr. Ajay Kumar is currently completing his Post Graduation from Department of Political Science, DAV College, Abohar (Punjab). He graduated from Guru Nanak Khalsa College Abohar in the year 2018 and has passed the National Eligibility Test (UGC-NET) in the year 2019. He has also participated and presented papers at many national and international seminars & multiple webinars, conferences, FDP and workshops. He has published many research papers. At the same time, he is very interested in studying international relations, Indian politics and Marxism.



Mr. Arbind Kumar has worked as a Assistant Professor (Political Science) and Research Associate (Gandhian Study Center) at DAV College Abohar, Punjab. He received his bachelor's and master's degrees in political science. He obtained his B.Ed. degree in the year 2015. He has passed National Level Examination U.G.C. NET in July 2018 in political science. He has also passed CTET (2016) at central level and Punjab Teacher Eligibility Test (2017, 2018) at the Punjab level. He started working as Assistant Professor (Political science) in July 2019. He has also participated in many national and international seminars & webinars, conferences and workshops. He is also interested in writing articles and journals.



Bharti Publications, New Delhi

Email-info@bhartipublications.com | bhartipublication@gmail.com
www.bhartipublications.com

ISBN 978-93-90818-26-6



Price- Rs 680



G. Sheela Edward

P. Kumaran

Benet Rajadurai

Problems and Prospects of Agriculture

 **LAMBERT**
Academic Publishing

PROBLEMS AND PROSPECTS OF AGRICULTURE"

CHIEF EDITOR'S

Dr. G. SHEELA EDWARD, Assistant Professor, Department of History, TBML College, Porayar, Tiruchirappalli	Dr P. KUMARAN, Assistant Professor, Department of History, C. Abdul Hakeem College Melvisharam, Tamilnadu
Prof J. BENET RAJADURAI, Assistant Professor, Department of Humanities - Sociology, St. Francis De Sales College, Hebbagodi, Bangalore	



About the Chief Editor: Dr. G. Sheela Edward

Dr. G. Sheela Edward is working as Assistant professor in the Department of History, TBML College, Porayar, Affiliated with Bharathidasan University, Tiruchirappalli. She pursued her degrees from Bharathidasan University, Tiruchirappalli. She has 13 years of teaching experience in history for UG and PG courses. She is also a research adviser of master of philosophy in history. She has published research articles in Scopus index international journals, book chapters in books. She has presented nearly 25 research articles in National and international conferences and seminars. Her research areas of specialization are agricultural laborers and women studies.


Agriculture in India is lifeline for a majority of the population and can never be underestimated. Although its contribution in the gross domestic product (GDP) has reduced to less than 20 per cent and contribution of other sectors increased at a faster rate, agricultural production has grown. This has made us self-sufficient and taken us from being a begging bowl for food after independence to a net exporter of agriculture and allied products. Reforms towards privatization, liberalization and globalization affected inputs market at a faster pace. Agricultural marketing reforms after 2003 made changes in marketing of agricultural outputs by permitting private investment in developing markets, contract farming and futures trading, etc. Working conditions of agricultural workers, like industrial, are one of the burning issues in a developing region. It is related to agricultural activities of the workers and their socio-economic status. This book provides various information's on Agriculture and its various dimensions.

93

Dr. G. Sheela Edward is working as an Assistant professor in the Department of History, TBML College, Porayar. She pursued her degrees from Bharathidasan University. She has 13 years of teaching experience in history for UG and PG courses. She is also a research adviser. She has published research articles in Scopus index international journals.



9 786205 527863



**A HANDBOOK ON
RESEARCH METHODOLOGY
FOR SOCIAL SCIENCES**



METHODOLOGY

CHIEF EDITORS
P. THANGARAJ
J. BENET RAJADURAI
Dr. G. SHEELA EDWARD



**Dr. G. Sheela
Edward**

Dr. G. Sheela Edward is working as Assistant professor in the Department of History, TBML College, Porayar, Affiliated with Bharathidasan University, Tiruchirappalli. She pursued her degrees from Bharathidasan University, Tiruchirappalli. She has 13 years of teaching experience in history for UG and PG courses. She is also a research adviser of master of philosophy in history. She has published research articles in Scopus index international journals, book chapters in books. She has presented nearly 25 research articles in National and international conferences and seminars. Her research areas of specialization are agricultural laborers and women studies.

CONTENTS

S.No	Chapter	Page No.
1	Research – An Introduction Mithun Mathew & Sampath Kumar	12
2	Crafting Literature Review Mrs. R. Kusuma & Mr. S.P. Prashanth	30
3	Understanding research design and sampling techniques Prof. Diliya Joseph & Prof. Lakshmi Balakrishnan	48
4	Data Collection – An analysis Nadar Shobana Selvaraj	70
5	Introduction to data interpretation Parasaram Kavya Sri & Dr. Nagaraj M Kotagar	99
6	Referencing in social science Research Dr. Kanchana Goudar	109
7	Publication ethics - Plagiarism Dr. Daisy & Dr. S. Marimuthu	124
8	Structuring a Research report J. Benet Rajadurai & Mr. R. Karthik	141
9	Sampling techniques used in social science research design Fr. Baiju Thomas	153
10	Signposts and mechanism of writing in research Dr. Vidya Nagre	173
11	Research design and types Dr. G. Sheela Edward	191
12	How to write research paper P. Thangaraj	203

About the Chief Editors



Prof P. Thangaraj, working as an Assistant Professor, P.G. & Research Department of History, N.M.S.S. Vellachamy Nadar College, Nagamalai Pudukottai, Affiliated to Madurai Kamaraj University, Madurai. He has completed his P.G. and MPhil degrees in University Rank and also qualified TNSET. He has completed the Rover Course & coordinator of College SC/DUT Unit. He has published Ten papers in reputed journals. His area of specialization is Modern Indian History and Women studies. He has participated and presented Twenty research papers in national and international level. He organized and presented and international level seminars and organized various national level seminars and signed five M.O.U. with various academic institutions. He has Life Membership in Society of India, AGAR Foundation and EAST trust. He received the Best Teacher Award 2021, from Human Rights Cell Unit of Tamilnadu & Puduchery.



Prof J. Benet Rajadurai, currently working as an assistant professor in the Department of Humanities – Sociology, St. Francis De Sales College, Affiliated to Bangalore University, Bangalore. He has completed UG with Gold medal and PG with University Second Rank and also qualified TNSET. He is the editorial board member of UGC care list journal and reviewer of Scopus journal. He has published twenty papers in reputed journals. His area of specialization is Rural Sociology, Social problems and Women studies. He has participated and presented Fifty five research papers in national and international level. He is the state Auction officer for Human Rights Literacy Mission, Delhi. He acted as a resource person for fifteen conferences in National and International level. He has organized various national and international seminars and also he organized various national and international faculty development programme.



Dr. G. Sheela Edward, is working as Assistant professor in the Department of History, TBM College, Porayar, Affiliated with Bharathidasan University, Tiruchirappalli. She pursued her degrees from Bharathidasan University, Tiruchirappalli. She has 13 years of teaching experience in history for UG and PG courses. She is also a research adviser of master of philosophy in history. She has published research articles in Scopus index international journals, book chapters in books. She has presented nearly 25 research articles in National and international conferences and seminars. Her research areas of specialization are agricultural laborers and women studies.



RYAN PUBLISHERS

B-3, LAKSHMI PRIDE,
80 FEET ROAD, 10TH CROSS WEST
THILLAINAGAR,
TIRUCHIRAPPALLI, 620018,
TAMIL NADU, INDIA
Email-contact@ryanpublishers.co.in
editor@ryanpublishers.co.in
website- www.ryanpublishers.co.in

ISSN 078-93-93253-06-1



9 789393 253064 >