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Sr. No.	Year	Number of Books	Chapters in Edited Volumes / Books	Papers Published in National/ International Conference Proceedings	Total Publications
1.	2021-22	02	01	01	04
2.	2020-21	07	02	Nil	09
3.	2019-20	Nil	Nil	Nil	Nil
4.	2018-19	02	Nil	01	03
5.	2017-18	Nil	Nil	Nil	Nil
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3.3.2

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and papers published in national/ international conference
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3.3.2

Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during the years 2021-22

List of Books and Chapters in edited Volumes/books Published and Papers published in Conference Proceedings

Sr. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	National / International	ISBN number of the proceeding	Name of the publisher
1.	Dr. Nitin Gaikwad	Recent Advancements in Science and Technology Research	Modified Theories of Gravitation	NA	National	978-81-950858-9-7	Vidhan Publishing Company. Amravati
2.	Dr. Prashant Ambekar	Advanced Engineering Materials- A Complete Text Book for BE- Sem-II;	NA	NA	National	9788195177271	Alliance & Company. Nagpur
3.	Dr. Mrs. Vaishali Meshram	A text Book of Chemistry Sem IV 2021	NA	NA	National	978-93-5202-424-7	Himalaya Publishing House, Nagpur

4.	Dr. Mrs. Shraddha Deshpande	NA	The study of Role of Rotaract Clubs in granting Incentives and Rewards and promoting Motivation with special reference to McClelland's Theory of Motivation	Proceedings of NAAC Sponsored Seminar on Quality Enhancement and Sustenance measures in Teaching, learning and Assessment	National	978-81-925323	Principal, CP & Berar E S College, Tulsibag, Nagpur
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Content

No.	Title	Page No.
1.	Study of Biological Active Herbal Medicines <i>Vitthal N. Gowardipe</i>	1
2.	Diversity of Spiders in the Agricultural Fields from Nandura, District Buldhana (Maharashtra State) <i>Dr. Amit Babanrao Vairale</i>	7
3.	Oxford Nanopore Minion:-Fourth generation sequencing technology <i>Rahul M. Suryawanshi</i>	17
4.	Renewable Resources <i>H.R.Dhanbhar; N.A. Kalambe</i>	26
5.	Wetland Conservation for Better Future <i>Dr. Jayvardhan V Balkhande</i>	34
6.	Estimation of Chlorophyll Content from <i>Some Medicinal Plants</i> <i>Poonam R. Gulhane</i>	39
7	Metronidazole and 2- methylimidazole as corrosion inhibitors in microbiologically influenced corrosion <i>Jitendra D. Girase</i>	45
8.	Modified Theories of Gravitation <i>N. P. Gaikwad</i>	54
9.	Ecocriticism in Romanticism: Teaches Unity in Biodiversity <i>Dr Rajesh Anandrao Ade</i>	58
10.	Laser Treatments in Agriculture <i>Dr. R. R. Mistry</i>	65
11.	Assesment of Fluoride Content In Nagzari Reservoir Tq. Kinwat Dist. Nanded (Maharashtra) <i>Dr. Anand P. Bhalerao and Mr. S.R. Rathod</i>	71
12.	Reducing Single Use Plastic Pollution: Role of Youth <i>Ku. Santoshi S. Agarkar</i>	73
13.	Organizing Business Data for Decision Making By Slicing and Prediction Analytics with Attribute Selection Measures <i>Dr. Aslam Yakub Suriya</i>	76
14.	External morphology and intestinal structure of teleost fish <i>Notopterus notopterus</i> <i>Dr.T A Khadse</i>	84
15.	Therapeutic Potential of Amines In Medicine <i>Vikas D. Umare</i>	90
16.	Avian Diversity of Chaparala Wildlife Sanctuary <i>Dr.Pankaj R. Chavhan, Dr. Sachin D Misar, Dr. P J Khinchi</i>	96
17.	Number System in Computer <i>Dr M N Quadri</i>	99
18.	Review on the Synthesis of Substituted Thiocarbamide Derivatives for Drug Design by Different Path <i>Dasharath M. Chavhan and Premlata M. Sonparote</i>	107

Chapter - 8

Modified Theories of Gravitation

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INTRODUCTION

It is apparent through numerous perceptions and hypothetical realities that our universe is going through a sped-up extension. Researchers guaranteed that dark matter and dark energy are behind this development. Modified hypotheses of gravity effectively clarified the account of the undetectable impacts of dark matter and dark energy. They analyzed different parts of modified relativistic elements and suggested that General Relativity (GR) may be modified to determine various sorts of cosmological issues. It has been observed that our universe contains 76% dark energy and 20 % dark matter. Dark matter is really an obscure type of matter which can't be distinguished in the research centre. The current sped up astronomical extension is the consequence of perceptions, for example, enormous microwave foundation radiations, redshift, Supernovae Type Ia and huge scope structures. These perceptions clarified the job of some baffling powers (that are being liable for the current cosmic development) behind this astronomical extension. It is believed that modified theories of gravity are very useful to explain the present cosmic expansion. Several mathematical models have been introduced to modify GR with the aim to explore the universe. The most important modified theories have been proposed in the last few

decades. Some of these are $f(R)$, $f(G)$, $f(G, T)$, $f(R, T)$ theories of gravity, where R , G , T and ϕ represents the Ricci scalar, Gauss-Bonnet invariant, trace of the energy-momentum tensor and scalar potential respectively.

Many researchers in different part of the world working on Bianchi Type (I, II, III...IX) Dark energy cosmological model with Modified gravity theory. Recently, the people like, Bhardwaj V. K., Pradhan A [1], Tiwari R. K. et al [2], Das K. and Bharali J. [3], Sofuoğlu D. et al [4], Shekh S. H., Chirde V. R. [5], Accelerating Bianchi type dark energy cosmological model with cosmic string in $f(T)$ Gravity, Sahoo P.K., Sivakumar M., [6]. have been working and examining numerous cosmological models in the general and changed hypothesis of gravity with the impacts of dark energy.

MODIFIED THEORIES OF GRAVITATION

To explore the universe, researchers have studied some different types of modified theories of gravity. Some of which are $f(G)$, $f(R)$, $f(G, T)$, $f(R, T)$, and $f(R, \phi)$ theories of gravity, where R is the Ricci scalar and G , T and ϕ stand for the Gauss-Bonnet scalar invariant, trace of the energy momentum tensor and scalar potential, respectively. These modified theories are of great importance because they effectively define the mysteries of the moving galaxies and clusters in the universe as alternative to GR. Lobo, F.S.N., Oliveira, M.A. [7] explained wormhole solutions in the $f(R)$ gravity and also presented a few exact solutions by considering specific shape functions and several equations of state. Researchers explained symmetric vacuum geometries in $f(R)$ theory of gravity and also discussed solutions in light of solar system constraints in $f(R)$ theories of gravity. Capozziello, S.; Cardone, V.F.; Troisi [8] examined spherically symmetric solutions in $f(R)$ theory of gravity by using the Noether symmetric approach. Capozziello, S.; Cardone, V.F.; Troisi [9] discussed extended theories of gravity. Sharif M., Ikram A., [10] introduced one of the most prospective and efficient versions of the alternative theories of gravity named as the $f(G, T)$ gravity and also examined energy constraints for the Friedmann-Robertson-Walker (FRW) spacetime. Shamir M. F., Malik A. [10] studied the behavior of anisotropic compact stars in $f(R, \phi)$ theory of gravity. They Shamir M. F., Malik A. [10], also discussed some exact solutions in $f(R, \phi)$ gravity using FRW universe. Some work related to this theory of gravity has been done in Shamir M. F., Malik A. [10].

The dark energy problem or, why the current universe is expanding with the acceleration, is considered to be one of the most

fundamental theoretical problems of the XXI century. There are various directions aimed to construct the acceptable dark energy model. Specifically, one can mention scalar (quintessence or phantom) models, dark fluid with the complicated equation of state (EoS), more complicated field theories with fermions, abelian or non-abelian vector field, string/M-theory, higher dimensions, etc. Nevertheless, despite the number of attempts still, there is no satisfactory explanation of dark energy origin. This is understandable having in mind that even current values of cosmological parameters are not yet defined with precise accuracy, and even less is known about their evolution.

The modified gravity approach is extremely attractive in the applications for a late accelerating universe and dark energy. Indeed,

- i. Modified gravity provides the very natural gravitational alternative for dark energy. The cosmic speed-up is explained simply by the fact of the universe expansion where some sub-dominant terms (like $1/R$) may become essential at small curvature.
- ii. Modified gravity presents a very natural unification of the early-time inflation and late-time acceleration thanks to the different roles of gravitational terms relevant at small and at large curvature. Moreover, some models of modified gravity are predicted by string/M-theory considerations.
- iii. It may serve as the basis for a unified explanation of dark energy and dark matter. Some cosmological effects (like galaxies rotation curves) may be explained in frames of modified gravity.
- iv. Assuming that the universe is entering the phantom phase, modified gravity may naturally describe the transition from non-phantom phase to phantom one without the necessity to introduce the exotic matter (like the scalar with wrong sign kinetic term or ideal fluid with EoS parameter less than -1). In addition, often the phantom phase in modified gravity is transient. Hence, no future Big Rip is usually expected there.
- v. Modified gravity quite naturally describes the transition from deceleration to acceleration in the universe evolution.
- vi. The effective dark energy dominance may be assisted by the modification of gravity. Hence, the coincidence problem is solved there simply by the fact of the universe expansion.
- vii. Despite quite stringent constraints from Solar System tests, there are versions of modified gravity which may be viable theories competing with General Relativity at current epoch. Nevertheless, more serious check of such theories.

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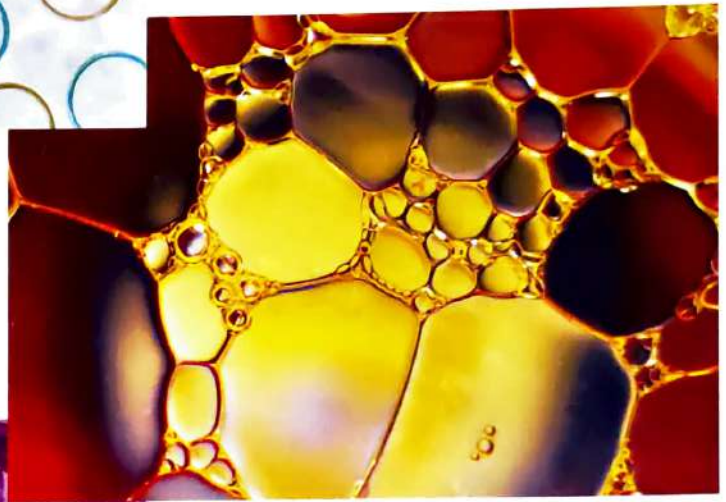
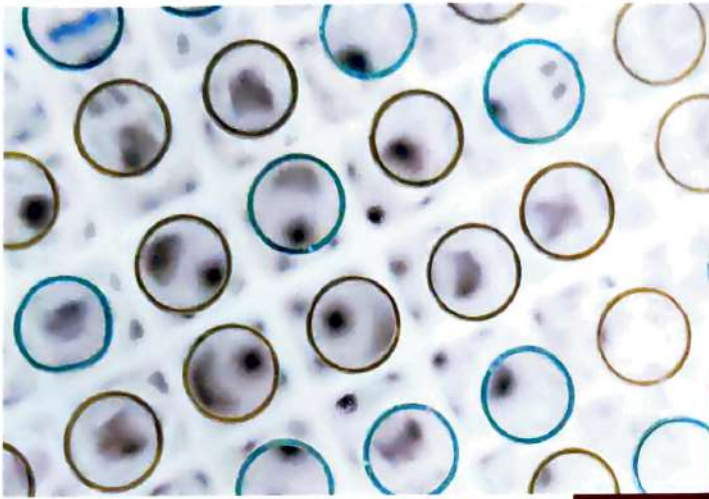
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ISBN 978-81-951772-7-1

2021.

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CONTENTS

Chapter No.	TITLE	Page No.
1	BAND THEORY OF SOLIDS	1-31
2	SEMICONDUCTOR DEVICES	32-77
3	MAGNETIC MATERIALS	78-98
4	SUPERCONDUCTOR	99-118
5	LASERS	119-144
6	NANOSCIENCE AND NANOMATERIALS	145-169
	Bibliography	170

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30.	Blended learning – A Quality Sustenance and Enhancement instrument Dr. Sameer Kailas Kuduple	114
31.	From Conventional to Virtual Learning: Transformation and Adaptability Dr. Shailesh Bahadure	119
32.	Types of Assessment Dr. Sheeba Qumar	124
33.	The study of Role of Rotaract Clubs in granting Incentives and Rewards and promoting Motivation with special reference to McClelland's Theory of Motivation Dr. Mrs. Shraddha. Deshpande	128
34.	Blended Learning: The Need of the Hour Prof. Dr Subhashree Mukherjee	133
35.	Innovation in Teaching and Learning Methods Dr. Swati R. Dame	138
36.	Use of ICT in Teaching and Learning Process: an Overview Dr. Vishnu M. Chavan	143
37.	Advantage and Drawback of Distance and Online Education in New Era Dr. Yogarajsingh R Bais	147
	Recommendations and Follow-up Actions	151

The study of Role of Rotaract Clubs in granting Incentives and Rewards and promoting Motivation with special reference to McClelland's Theory of Motivation

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Abstract:

Community development can be an integral part of students' academic life if they are engaged in authentic learning through their involvement in community services. In addition to this, their life skills such as communication, decision making, problem solving, self-awareness, empathy, emotional intelligence, resilience etc, can be developed as they become aware of the local community needs and issues which otherwise, they would have never learned. By enrolling in Rotaract clubs, students can become members and community partners in helping their society's growth. In this paper it is studied how students can be motivated to be enrolled in such community-based clubs and how such affiliations will help them to achieve incentives, rewards and motivation for their future life.

Keywords: Community Learning, Rotaract Club, McClelland Theory of Motivation

Introduction

Students pursuing higher education are in middle and late adolescent age where they are constantly striving to prove their merit. This transition stage shifts their focus from dependency to being independent in terms of planning and execution. Their sense of individuality brings them face to face with challenges in career, relationships and health. A holistic guidance and motivation at this threshold can prove fruitful in order to avoid risks, which they might encounter because of their untimely half-mature impulses. Spending time with friends, improving fellowships, working in collaborations in peer groups are their foremost needs, if when fulfilled, can form steady and binding relationships. Therefore, academic bodies should

be inclined towards engaging undergraduates in tasks that involve them in interactions, leadership, teamwork, and decision-making. Such enterprising activities will motivate them towards achievement, power, and affiliation, as postulated by American psychologist David McClelland in his theory of motivation. McClelland says that, regardless of our gender, culture, or age, we all have three motivating drivers, and one of these will be our dominant motivating driver. This dominant motivator is largely dependent on our culture and life experiences."In the 1960s he explained that, the needs of individuals vary from time to time and do not necessarily be the result of race, age or location. As this study is specially for Indian students, one needs to understand the role of community in shaping the youth of India. Though diversity in language and traditions is the unique identity of India, its value system followed in these diverse communities is one of the strongest of all nations. Even the Indian education system propagates the worthiness of morals and ethics in the development of professionals inculcating human values. Indian education system is the result of an amalgamation of colonial educational structure and the deep-rooted concept of religion and philosophy. Respect for each other, unity in diversity, helping others, rightful conduct and dutiful actions are few values which are a part of Indian curriculum even today.

"It is inspired by the teachings of Swami Vivekananda, who said" Education is the process by which an individual grows, develops and becomes increasingly well-adjusted in an ever-changing society. Education provides experience that enables a person to form desirable habits, broaden mental horizons, deepen understanding of society, and acquire skills to solve problems encountered in day-to-day life. Therefore, the process of education must help an individual to acquire moral qualities, discipline, dedication and devotion to truth. The mind of an educated person should be fearless and

cultured.

Motivation theory of McClelland'

Motivations are primarily separated into two categories: extrinsic and intrinsic. Good news if neither of these gets the job done. Researchers have identified a third type of motivation that's impressively effective. 'Family' has emerged as a third source of motivation, proven to be a strong source of inspiration — even for those who do not feel intrinsically or extrinsically motivated to do something", opines Brianna Steinhilber in her article in nbcnews.com. In adolescent age, parents and family take a back seat, whereas friends and peers occupy the front ones. Social, cognitive and personal development at this stage is boosted through shared activities with other adolescents, adapting to the concept of homophily. They tend to create personal networks and form core groups based on their distinctive choices they have made

while forming it. They co-evolve, by functioning in small groups, be it knowledge-intensive work or social work; each activity motivates them further to do better in every successive attempt.

McClelland's theory, first principle states, people desire appreciation for their achievements through their performance in a particular field. For example, a student wishes to be known for his academic excellence and wants to be recognized by his teachers for the same. In the same way, students working in groups for a group task or an association strive to prove excellence by involving themselves in innovating and accomplishing new projects. Constant feedback for them is vital, as McClelland's achievement motivation theory suggests, as it "is applicable to people who are comfortable working in a hierarchical system that rewards performance-linked achievements". He also suggested "four characteristics that are consistent with the need for achievement: striving for an average task complexity; responsibility for own performance; the need for feedback, and the use of innovation/creativity."

The second one he laid his opinion on was the need for power. He suggested that one is boosted and motivated when others accept and follow his ideas. This displays his need for authority and he "aims to influence and alter the other person's decision to suit their own wishes". His study also claimed that the need for power influences one to be a good leader. They are adept at managing their own skills and expect others to be disciplined as well. Associations and organizations are a place where these leadership skills can be put to use and fetch them the personal reputation and social standing that they are longing for. The last one of them is the need for affiliation, which shares the same idea as one of the greatest English poets, John Donne's sermons "No man is an Island". This connotes those human beings are social beings who are connected to each other through minor and major communities. This can be achieved through collaborations and alliances pertaining to specific group needs. Friendly and long-term relationships can be formed and maintained, if they follow common goals and intentions. However, affiliations put individuals on secondary stage and focus on joint efforts within a cooperative structure.

What are Rotaract Clubs? What are its goals?

Rotaract brings together adults ages 18-30 to take action in their communities, develop their leadership and professional skills, and have fun. Rotary clubs sponsor them, but Rotaract members manage and fund their clubs independently.

Decoding the secrets of Rotaractors from: 7 things you don't know about Rotaract 1. Rotaractors are experts in their field. 2. They think beyond their clubs 3. They are redefining what it means to be a Rotarian. 4. They excel at recruiting 5. They embrace the opportunity to learn 6. They find creative solutions 7. They know what they want The goals of Rotaract Club of the college are: • To develop professional and leadership skills; • To emphasize respect for the rights of others, and to promote ethical standards and the dignity of all useful occupations; • To provide opportunities for young people to address the needs and concerns of the community and our world; • To provide opportunities for working in cooperation with sponsoring Rotary clubs; • To motivate young people for eventual membership in Rotary.

Research Design Objectives:

1. To observe the development of Life skills among Rotaractors through Rotaract Club activities.
2. To observe the impact of Incentives, Rewards and Motivation among Rotaractors through Rotaract Club activities.

Participants: Students of B.Sc. I, II and III years.

Procedure: Rotaractors participate in and organize various events under the aegis of their Registered Rotaract Club.

Outcomes: Incentives as Achievements

"The incentive theory, sometimes called the Reward Motivation Theory, suggests that motivation is largely fueled by the prospect of an external reward or incentive. The incentive could be tangible (e.g., money) or intangible (praises from someone)." Rotaract Club gives its members an opportunity to achieve something and gets incentives for it. It was observed that, the four members of the club achieved incentives in the form of deduction in the annual fees

of the coming year by the institution for their outstanding contribution as volunteers for Nagpur Municipal Corporation during second and most threatening wave of Covid. Registration fee for camp for deserving members was contributed by the Parent club, Rotary Club of Nagpur Downtown as an appreciation of their participation in the club activities. One of the students got an opportunity to attend a Rotaract Conference as his registration fees were contributed by the Institute. Students' dedication and hard work in conducting events instigated the Parent Club to sponsor their events motivated them to do better in the coming event. All these incentives, the members received in different forms marked their achievement in the present and for the future, too.

Rewards as Power:

A registered Rotaract Club gets an opportunity to prove its merit according to activities the club has conducted during an academic session. A competitive spirit is developed as these Rotaractors from different districts contest each other for scoring points and eventually winning awards for their respective clubs. A score sheet is designed and developed every year, displayed to clubs, who then strive hard to score maximum marks to reach, to stand in the list of top ten clubs among all. When the awards are won, the power of the club is unveiled and the legacy of doing good work is carried forward. The power increases as the number of awards, if taken positively, it influences coming generations. The college club bagged District Rotaract Representative Citation, RID 3030 with Platinum distinction, and was recognized for the participation in district project Nirmalya Collection for Rotaract District Council of RID for R.Y. 2019-20. In the subsequent year 2020 -21, the club once again received Rotary Citation by President, Rotary International. The members also clinched the awards given by the Parent Clubs. Apart from awards, four Rotaract Board of Directors got special recognition from the Department of Higher Education, Ministry of Education, Government of India, for their philanthropic contribution as member of Beat Covid Campaign initiative of Mahatma Gandhi national Council of Rural Education, Hyderabad. These members counseled the pandemic-stricken citizens by attending their phone calls and providing them beds in hospitals for admission. This experience made the members feel capable and authoritative to execute such important and crucial tasks with great responsibility and power.

Motivation for Affiliations

The new face of technology has changed or minimized the interaction between humans, yet the need for companionships and social life, formal or informal, remains the same. "Alone we can do so little; together we can do so much," said Helen Keller, and seems very appropriate, as everyone's desire can be accomplished if carried out in collaboration. The synergy of people with common aims and goals, when utilized effectively, results in success and motivates the team to build more mutually supportive affiliation goals. There are certain initiatives which require sustainable objectives and need suitable manpower; especially in such cases, a tangible outcome can be sought through proper affiliation. When different clubs work on one project, ideas, resources and workforce are exercised in a heterogeneous manner. If the delegation of work is done appropriately and evenly, each member is benefited and empowered through a competitive spirit within the group. Rotaract club of the college

organized various activities in collaboration with different clubs as a host as well as a participant. Each such opportunity proved an impetus to the members, as their internal and external communication improved, leading to more partnerships. While they hosted webinars or organized competitions, the work was efficiently distributed among the participating clubs in such a way, it maintained the hierarchy and compassion among the peers. Hosting events with other clubs, created better leaders, who were self-motivated to display empathy and were more concerned with other's acceptance.

Conclusion Among all the theories of motivation, McClelland's theory helped the institute identify members needs and how they could be motivated through gaining achievements, acquiring power, and winning affiliations. It was observed that the students who became members in their first semesters continued till their final semesters, attaining leadership roles in subsequent years. Initially the members were less in number and knew less about the working of the Rotaract Club, but eventually they were motivated towards their commitment to society by doing smaller projects. When the club was officially registered and the point system was introduced, it provoked a sense of competitor ship and changed their approach from a general to a more goal-oriented behaviour. Thereafter, each member envisioned the club as an assemblage and started working towards achieving excellence through intellectual and experiential novelty. As Jiddu Krishnamurti rightly pointed out, "There is no end to education. It is not that you read a book, pass an examination, and finish with education. The whole of life, from the moment you are born to the moment you die, is a process of learning. The club has given them a learning environment where they are happily and willingly contributing to social and community causes. The consistent efforts made by the club members had won them

accolades not only from parent club but also from government agencies and citations as forms of incentives, rewards and motivation at different levels.

Recommendations "Success is no accident. It is hard work, perseverance, learning, studying, sacrifice and most of all, love of what you are doing or learning to do," Pele opined. As students are interested in doing extracurricular activities along with academics, they should be motivated to do so. The importance of intrinsic motivation is at par with an extrinsic one. The combination of both, if put to use, can bring about comprehensive progress in the personality of an individual. The paper makes a sincere and thoughtful recommendation regarding engaging students in community enhancement activities through such clubs. Introduction of community clubs and registering them on an official platform will motivate the members to enhance their life skills through social work. These real time projects will give them a chance to identify the problem, analyze the possible solutions, and create a vision for solving it. Institutes of higher education should acquaint their learners to Rotaract Club activities, and should register it, which will give, the student as well as the institute a distinct identity on a global platform. Once the club is registered, it should study and understand the scoring system and plan their activities accordingly. The role of Teacher – in charge of the club also is pivotal, as students' needs guidance in certain areas such as communication, teamwork, decision making, and execution. Under the appropriate guidance of the facilitator, the members are motivated to face competitive situations and utilize their potential to overcome their shortcomings. In the whole process, the Contractors achieve different stages of self-actualization through "curiosity; creative living, and fulfilling work, is not necessarily attained or attainable by all humans".

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Sr. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	National / International	ISBN number of the proceeding	Name of the publisher
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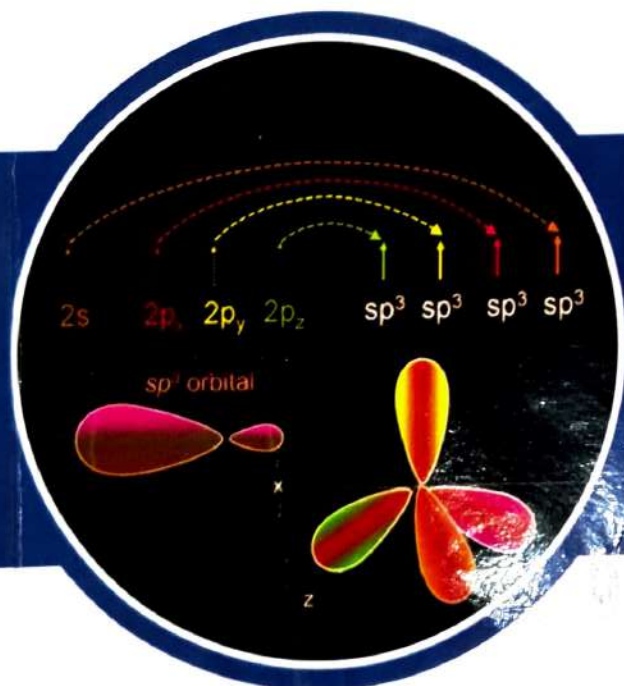
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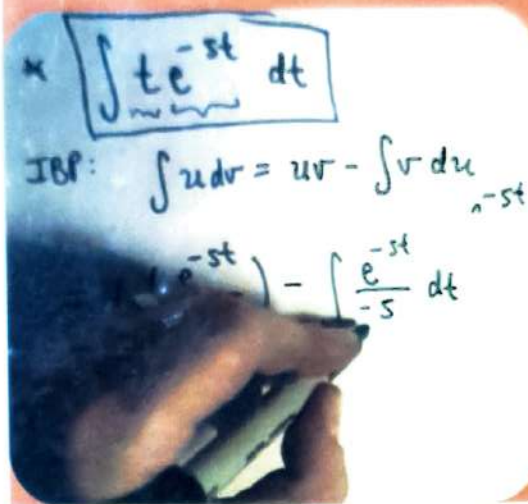


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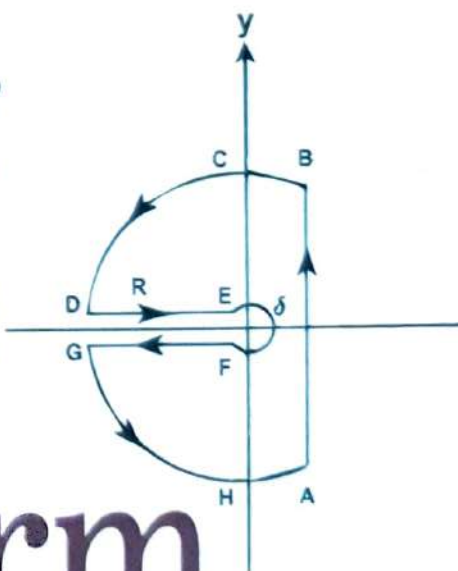
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The Laplace transform is named after mathematician and astronomer Pierre-Simon Laplace, who used a similar transform in his work on probability theory. Laplace wrote extensively about the use of generating functions in *Essai philosophique sur les probabilités* (1814), and the integral form of the Laplace transform evolved naturally as a result. Laplace's use of generating functions was similar to what is now known as the z-transform, and he gave little attention to the continuous variable case which was discussed by Niels Henrik Abel. The theory was further developed in the 19th and early 20th centuries by Mathias Lerch, Oliver Heaviside, and Thomas Bromwich. The current widespread use of the transform (mainly in engineering) came about during and soon after World War II, replacing the earlier Heaviside operational calculus. The advantages of the Laplace transform had been emphasized by Gustav Doetsch, to whom the name Laplace Transform is apparently due.



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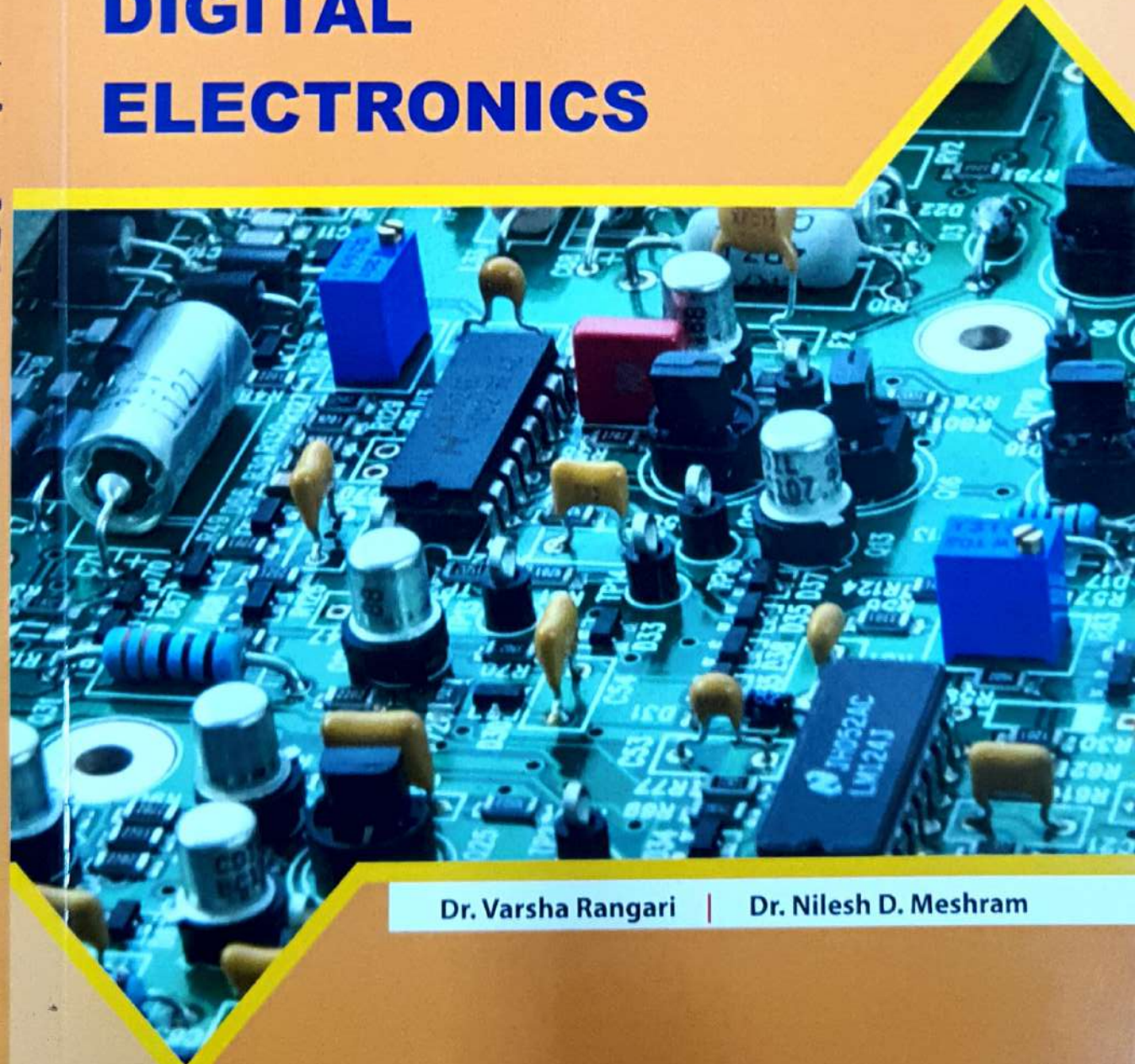


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INDEX

Sr. No.	TITLE	Author/s	Page No.
1	An update on the traditional medicinal potential of Acanthaceae members	Ashwini Sirsat and Pratiksha Kokate (Umale)	1
2	Anti-dandruff activity of <i>Garcinia indica</i>	Abhijit Sahasrabudhe	8
3	Ethnomedicinal investigation of herbal vendors in North Maharashtra (India) combating kidney stones and urinary complaints	Y. A. Ahirrao, M. V. Patil and D. A. Patil	16
4	Qualitative phytochemical screening of <i>Pseuderanthemum atropurpureum</i> (W. Bull) Radlk.	A. M. Shrirame	25
5	Herbs for asthma used by tribals of Gondia District (MS) : Challenges to Covid-19 pandemic	A. A. Jagiya, K. M. Borkar and A. K. Zingare	33
6	Evaluation of cytotoxicity of common vegetables <i>Momordica charantia</i> and <i>Lagenaria siceraria</i> by Allium test system	Aniruddha S. Deshpande, K. D. Aswar and S. N. Malode	40
7	Separation of pigments from few medicinal plants using ascending paper chromatography	Ashwini B. Phokmare	50
8	Floristic survey of economically important plants from Akot region, Dist. Akola (MS) India	Pooja Ingle, Gopal Dhobale and Nikhil Choukhande	55
9	Induction of systemic resistance in plants: a review	Deepak K. Koche and Kapil D. Kamble	73
10	Census of genus <i>Indigofera</i> L. in Jalgaon District, Maharashtra, India	D. N. Undirwade	85
11	Effect of IBA and 2,4-D pre-treatments on seed germinability and rooting of stem cuttings of <i>Jatropha</i> species	Rajesh Shrirangrao Gaikwad	90
12	The recent updates of wild edibles and its nutraceutical values: a review	Manjusha P. Wath and Shubham A. Rathod	99
13	Indian kitchen and unseen immunity against Covid-19 biology	Manoj Patidar	106
14	Study of weed diversity in irrigated crop fields of Digras, District Yavatmal, (Maharashtra) India	P. V. Gadkar and M. M. Dhore	118
15	Mellisopalynological study in some honey sample from Wani Tehsil, Dist. Yavatmal (MS) India	Hemant D. Malekar and Amit V. Khandalkar	122
16	Surveillance for diversity of fungal spores in intramural environment of Anganwadi unit (pre-primary school) at Kamptee (MS) India	Jayshree S. Thaware	129
17	Pharmacognostic studies on <i>Phyla nodiflora</i> (L.) Greene: a ethnic herbal aphrodisiac	U. R. Kanerkar and P. Y. Bhogaonkar	140
18	Morpho-anatomical and pharmacognostic studies of medicinal plant <i>Acalypha indica</i> L.	K. M. Borkar, W. Y. Tagade, and M. V. Kawale	150
19	Conservation of green fodder with the green foliages of Maize and Berseem	K. B. Bendre	157
20	Algae: Source of biofuel	Lalita L. Sawarkar and Shaligram R. Hiwale	162
21	Isolation and screening of flavonoids from <i>Glycine max</i> and <i>Vigna radiata</i>	Neha R. Tiple and Vimal P. Dakhane	167
22	Determination of morphological variability among 10 genotypes of mustard (<i>Brassica napus</i> L.) and their application for DUS testing	N. S. Hinge and S. N. Malode	175
23	Herbal medicine treatment for skin diseases by the Korku tribes of Melghat forest, Amravati region (MS) India	Nitin A. Khandare	187
24	Phytochemical screening of some Lamiaceae members having ethnomedicinal potential	Nutan Rajput	190
25	Effect of various growth regulators on shoot multiplication in rapid regeneration of <i>Enicostemma littorale</i> Blume	Nutanvarsha P. Deshmukh	199
26	An update on phytochemical composition of some members of family Euphorbiaceae	Anand V. Oke, Himanshu S. Jaiswal and Dinesh D. Khedkar	205

27	Pharmacognostic approach and response of <i>Artemisia pallens</i> wall to VAM and algal inoculations by root trainer technique	Pradhnya G. Khapekar	216
28	A note on biodiversity of weeds from Akola District	P. M. Khadse	222
29	Phytochemical analysis of aqueous extract of <i>Moringa oleifera</i> Lam. And <i>Ocimum sanctum</i> Linn.	Pranjali Deshattiwar, L. P. Dalal and Swati Kalode	225
30	Inventory of aquatic macrophytes in Kapsi lake, Kapsi Dist. Akola (MS) India.	P. J. Deshmukh	233
31	Effect of ethyl methyl sulphonate (EMS) on seed germination in <i>Dianthus caryophyllus</i> L. var. Chabaud	P. D. Deshmukh	240
32	Preliminary phytochemical screening of two plant species <i>Syzygium cumini</i> and <i>Nigella sativa</i> , traditionally used to treat diabetes	Mohd. Abuzar Mohsin Ahmad, P. Y. Anasane and S. B. Waghmare	251
33	Monitoring potentially important data of vegetation spot by using GIS and GPS technology as tool	Ranjan B. Kalbande	257
34	Diversity digitized - digital plant images as specimen by applying web technology	Ranjan B. Kalbande	261
35	Impact of nanoparticles and arbuscular mycorrhizal fungi on plants: a review	R. C. Maggirwar, S. P. Khodke and M. M. Malviya	267
36	Pharmacognosy, fluorescence study, phytochemistry and antioxidant activity of <i>Leucas stricta</i> Wall. Ex. Benth.	Rupali P. Shirsat	274
37	Diversity of some aquatic hyphomycetes from two water bodies of Nagpur District of Maharashtra, India	R. T. Jadhav and K. N. Borse	283
38	Study of mycoflora of indoor environment in selected schools of Akola city (MS) India	Rasika N. Patil	291
39	<i>Zingiber capitatum</i> roxb - a new report for Gondia District, (MS) India	Ravindra Zode, Walay Tagade and Mahesh Meshram	302
40	Conservation management of Karanja sohol black buck sanctuary (MS) India	P. B. Ingle, S. S. Rokade, M. V. Sawdekar and A. J. Sawant	308
41	Effect of phosphate sources on growth of <i>Alternaria rassicicola</i> causing <i>Alternaria</i> leaf spot of cabbage	S. G. Yadav	313
42	Embryological investigations in <i>Utricularia aurea</i> Lour (Lentibulariaceae)	S. P. Dakhore and N. M. Dongarwar	317
43	Studies on medicinal importance of crop weed plants of Akot Tahsil, Maharashtra, India	Santosh N. Patole	328
44	Investigation on pollen biology of <i>Adhatoda vasica</i> Nees.	Sneha W. Wagh and Prajakta N. Bathe	334
45	A new edible mushroom with a new hope	Somanjana Khatua and Krishnendu Acharya	344
46	Report of a new Achenal fruit from Deccan Intertrappean Beds of Central India	S. W. Dighe., P. S. Kokate and M. B. Bobade	354
47	Effect of humidity and average temperature on the occurrence of white rust in field under Vidarbha region	Sumit S. Choudhari and S. N. Malode	361
48	A petrified seed <i>Utricularia rodeii</i> gen. Et. Sp. Nov. from the Deccan Intertrappean Beds of Mohgaonkalan, M.P., India	S. V. Pundkar, P. S. Kokate, and K. M. Thorat	366
49	Antifungal activity of some Indian spices against pathogenic fungi	V. S. Patil and P. D. Landkar	374
50	Indirect androgenesis and development of haploids in <i>Catharanthus roseus</i> (L.) G. Don.	V. R. Narkhedkar, J. A. Tidke and N. J. Chikhale	383
51	Antibacterial activity of stem, leaf and flower extracts of <i>Eucalyptus</i> spp.	V. J. Parsodkar and V. W. Patil	398
52	Protein pattern of mucus gland and seminal vesicle in the Indian honeybee, <i>Apis cerana indica</i> (f.)	A. B. Sawarkar	404
53	Diversity and distribution of birds in different	A. J. Wanjari	412

	habitats of Pandharkawada Tahsil (MS), India		
54	Diversity of orb-weavers from Satpuda landscape	Anuradha Rajoria	421
55	Birds of Maljura Nature Interpretation Centre Patur District Akola (MS) India	Amrita M. Shirbhate and Milind V. Shirbhate	429
56	Role of spiders for trapping harmful insect from traditional crop around farm field of Dharni Melghat region	R. B. Bahadure and P. M. Makode	434
57	Current status of family Mastacembelidae in Akola District (MS) India	P. S. Dhabe	439
58	Quantitative distribution of bacteria associated with freshwater crab <i>paratelpusa jacquemontii</i> (Rathbun) from Nal-Damayanti Sagar Dam Tq. Morshi Dist. Amravati (MS) India	A. U. Ghaware and R.G. Jadhao	442
59	An intramural study of airborne fungal spores in laboratories of Govt. Institute of forensic science, Nagpur	Bhupali Bhusari, Archana Mahakalkar and Hemant Sapkal	447
60	Effect of Cypermethrin on heartbeat of <i>Periplaneta americana</i>	J. V. Pawara	457
61	Diversity of Gekkonidae species (wall lizards) in Buldhana region (MS) India	V. R. Kakde and A. C. Thakur	462
62	Morphometric and qualitative analysis of Rotifer in upper Morna reservoir, Medshi, Dist-Washim, Maharashtra (India)	M. R. Solanke and D. S. Dabhade	464
63	Preliminary checklist of Damselflies and dragonflies (Insecta, Odonata) of Karanja Sohul Wildlife Sanctuary	Milind Shirbhate and Amrita Shirbhate	474
64	Migration: an environmental fascinating aspect of the birds life	Nilima M. Kankale	481
65	Cladoceran diversity in lentic ecosystem of Shivan reservoir with reference to physicochemical parameters	P. M. Makode and R. B. Bahadure	484
66	Histophysiological alterations caused due to intoxication of Atrazine herbicide in Wistar albino rats (Male).	P. M. Ramteke	496
67	Spider diversity in organic farming of Dr. Panjabrao Deshmukh Krishi Vidhyapith Campus Akola (MS) India	Prakash P. Ade	504
68	Physico-chemical parameter of kumbhar kini dam of yavatmal district (ms) india	Shubhangi B. Misal	520
69	Characterization of Exochelin an extracellular iron chelator Siderophore of <i>Pseudomonas stutzeri</i> of SGM 1 strain	S. D. Adole and S. M. Chavhan	530
70	A new gall midge (Cecidomyiidae: diptera) from Hingoli (MS)	S. S. Bhalerao	538
71	Effect of environment on the different developmental stages of common Mormon butterfly (Lepioptera: Papilionidae)	Dnyaneshwari M. Satarkar and Nisha V. Warade	542
72	A multifunctional biomaterial: Spider silk	A. S. Sawarkar	547
73	Habitat fragmentation and biodiversity	Sujata Kawade	543
74	Effect of double dose of Carp pituitary extract on the breeding performance of the Snakehead Uurrel, <i>Channa punctatus</i> (Bloch)	Tushar G. Deshmukh	562
75	Diversity of copepods in lentic ecosystem of Sonala Dam, Sonala, Dist. Washim, (MS) India	Ujwala P. Lande	568
76	Allelic frequency of abo and Rh d blood group among the population of endogamous group of Amravati District (MS) India	Sumit Wankhade and Santosh S. Pawar	574
77	Novel covid-19 disease, human health related complications and its prevention	A. S. Pethe	579
78	Lonar lake: Physicochemical qualities of water	A. L. Pawar and P. V. Gadakh	584
79	Application of ash as a natural fertilizer for plant growth	A. A. Balode, S. S. Bhutekar and H.V. Dhanokar	591
80	Probiotication of Papaya juice – an innovative	G. D. Surve, R. R. Pachori and	600

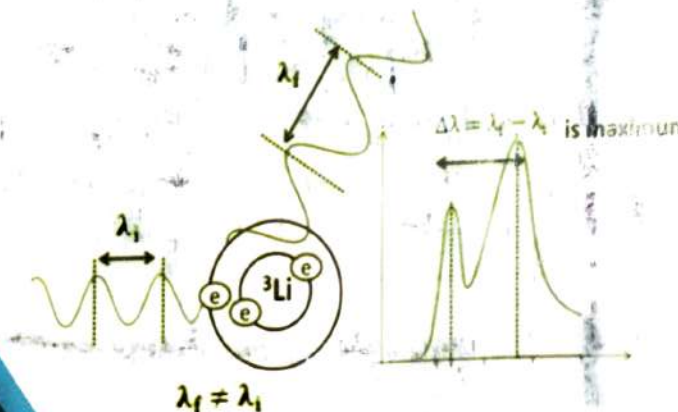
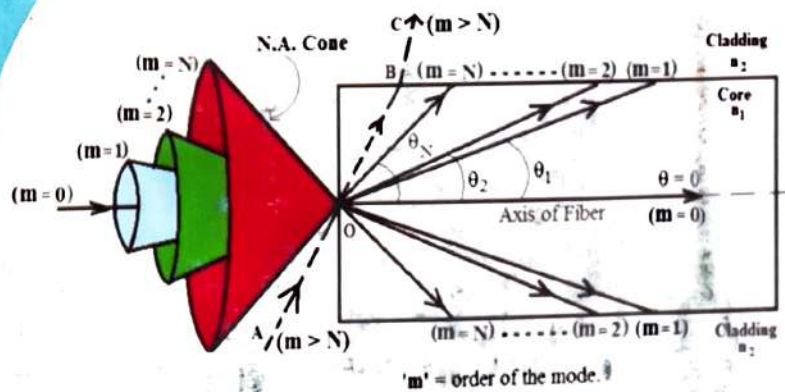
	approach	B. N. Maniyar	
81	Study of antimicrobial, anti-inflammatory and antioxidant activities of phytochemicals extract from <i>Tribulus terrestris</i> L.	S. P. Mahire and S. N. Patel	607
82	Biosurfactant producing bacteria <i>Achromobacter insolitus</i> isolated from petroleum contaminated sites	P. V. Gadakh and A. L. Pawar	612
83	Current scenario of food security in India	R. M. Bhise and P. V. Pohare	621
84	Astrobiology and planetary science	Radhika G. Deshmukh	629
85	Environmental and nutritional factors affecting Rhamnolipid production produced by <i>Pseudomonas aeruginosa</i>	Swati N. Zodpe	638
86	Assessment of <i>in vitro</i> anti-arthritic activity of <i>Nyctanthes arbortristis</i>	S. M. Patil, R. L. Dabhade and Farheen Qausar Abdul Rafique Ansari	647
87	Genetic divergence studies in <i>Lathyrus (Lathyrus sativus</i> L.)	Vandana S. Madke and D. R. Rathod	655
88	Diversity of Microfungi associated with leaf litter from Chikhaldara, District Amravati (MS) India	Dilip Hande, Kishor Suradkar, Suruchi Kadu and Ninad Dharkar	665
89	Minor insect pest on Banana in Anjangaon Surji region, District Amravati, Maharashtra	M. R. Yeotkar	671
90	E-survey to study the site selection for diatomic sample, cleaning methods and staining techniques of diatoms	R. A. Patil Bhagat and K. S. Mawande	675
91	Conservation of the native rock bee <i>Apis dorsata</i> in the Melghat forest region of the Amravati District with the help of Korku tribe	M. T. Wakode, Nitin M. Labhane and Vaishali N. Labhane	683
92	Evaluating role of some medicinal plants having antibacterial property as quorum quenchers	Ruchi Wasnik , Vimal Dakhane and Sonali Bhaizare	689
93	Internet of Things (IoT) in Indian Agriculture: New opportunities and perspectives	Rita Rathod, Darasing R. Rathod, Prashant R. Shingote, Khushal Rathod, Shyam D. Jadhav, Gajanan D. Chandankar, Meghraj T. Chavan, Sandip Gogate, Nitin W. Raut and Dilip T. Dhule	699
94	Adoption of Zero Budget Natural Farming method in India for sustainable agriculture	Meghraj T. Chavhan, Darasing R. Rathod, Prashant R. Shingote, Khushal Rathod, Shyam D. Jadhav, Gajanan D. Chandankar, Rita Rathod, Nitin W. Raut and Dilip T. Dhule	725
95	General Principles of Quality Seed Production	Darasing R. Rathod, Vandana S. Madke, Surendra B. Deshmukh and Sandip M. Gogate	734
96	Types and distribution of Aroids in Bhandara District (MS), India	Pitambar Humane	745
97	Wild plant <i>ocimum americanum</i> and its uses in herbal medicine cosmetics	Sharada K. Ulhe	752



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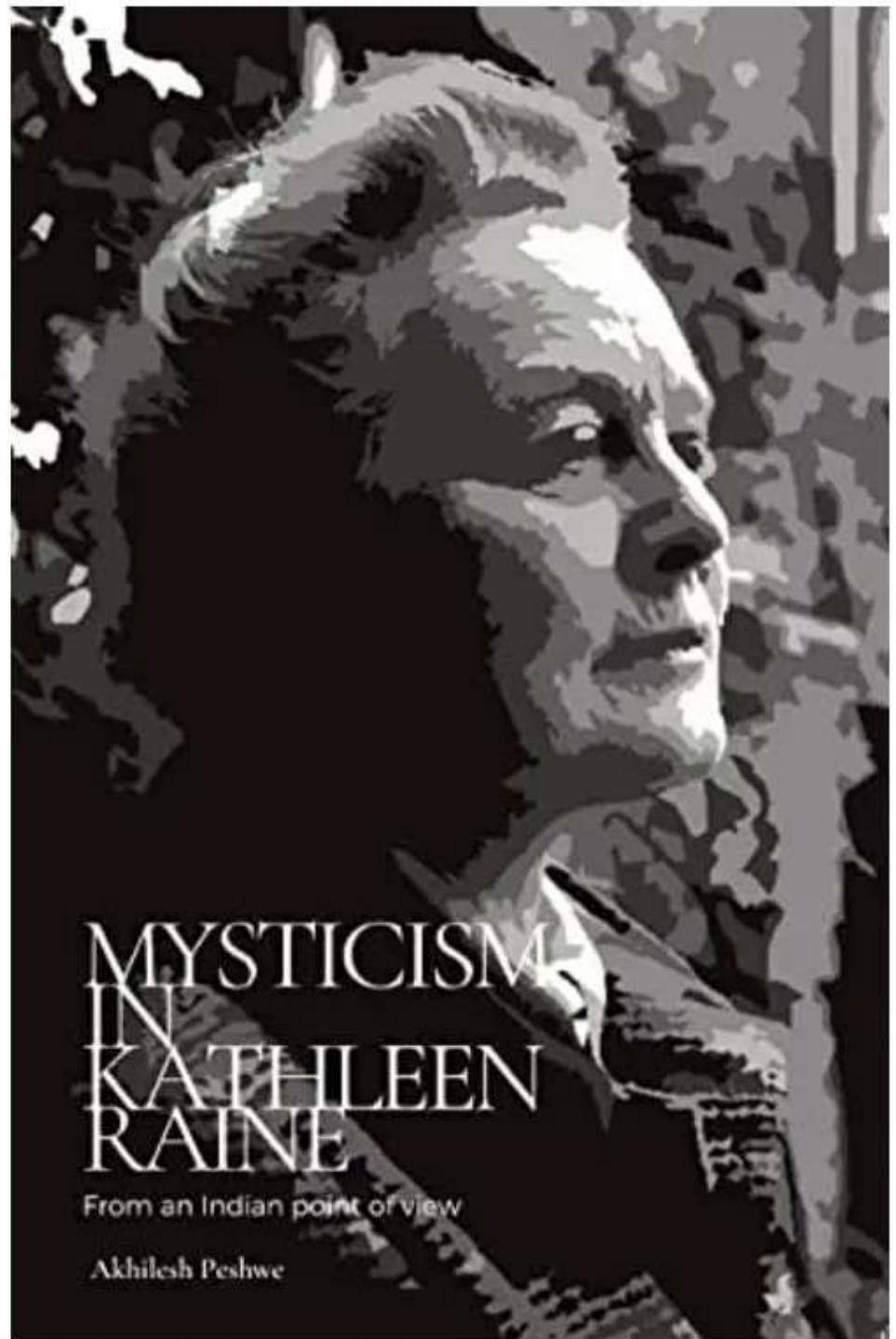
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ISBN: 978-93-5596-416-8



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ISBN: 978-93-5596-416-8

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₹ 250/-

Chemical Methods for Processing Nanomaterials

Editor

Vidya Nand Singh

National Physical Laboratory (CSIR)
New Delhi
India



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Cover images provided by the editor of the book.

First edition published 2021
by CRC Press
52 Vanderbilt Avenue, New York, NY 10017

and by CRC Press
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

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Library of Congress Cataloging-in-Publication Data

Names: Singh, Vidya Nand, 1976- editor.

Title: Chemical methods for processing nanomaterials / editor, Vidya Nand Singh.

Description: First edition. | Boca Raton : CRC Press, Taylor & Francis Group, 2021. | Includes bibliographical references and index.

Identifiers: LCCN 2020029168 | ISBN 9780367085889 (hardcover)

Subjects: LCSH: Nanostructured materials.

Classification: LCC TA418.9.N35 C479 2021 | DDC 660/.282--dc23

LC record available at <https://lccn.loc.gov/2020029168>

ISBN: 978-0-367-08588-9 (hbk)

Typeset in Times New Roman
by Radiant Productions

Preface

The purpose of this book is to summarize the recent developments in the important research field of “Chemical Processing of Nanomaterials”. Book chapters were invited on different methods for fabricating nanomaterials. Finally, the book is being published with fourteen chapters. The topics are focused on chemical methods for processing nanomaterials. The target audience of change the proposed with this book is academia and researchers in the universities and the research laboratories. Nearly 15% of researchers in different area deal with nanomaterials, and among them 60–70% of them employ chemical methods for processing nanomaterials. The present book gives various aspects of chemical processing of nanomaterials. This book describes latest synthesis methods for all kinds of nanostructures using various chemical methods. It also describes the latest techniques used for synthesizing and characterizing nanomaterials of several kinds, such as active groups, core-shell, quantum dots, metal and metal oxide, perovskite nanocrystals, etc. The chapters deal with chemical methods for chalcogenides, nanostructured materials using microemulsions, wet chemical methods for nanomaterial synthesis, chemical vapor deposition method, sol-gel processing of nanocrystalline metal oxide thin films, electrodeposition—a versatile and robust technique for synthesizing nanostructured materials, synthesis of nanomaterials and nanostructures, low dimensional carbon nanomaterials, synthesis and applications of two dimensional materials, methods of manufacturing composite materials, surface modification of nanomaterials, nanomaterials for gas sensing applications and the synthesis process of the quantum dots.

I would like to thank all those who have kindly contributed chapters for this book. Thanks are also due to Dr. Prashant Ambekar and Dr. Jasmirkaur Randhawa for their help in finalizing and improving the contents of the book.

Vidya Nand Singh
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Contents

<i>Preface</i>	iii
1. Chemical Methods for Processing Carbon Nanomaterials <i>Sehmus Ozden</i>	1
2. Synthesis of Nanomaterials and Nanostructures <i>Preeti Kaushik, Amrita Basu and Meena Dhankhar</i>	39
3. Wet Chemical Methods for Nanoparticle Synthesis <i>Abhijit Jadhav</i>	49
4. Electrodeposition—A Versatile and Robust Technique for Synthesizing Nanostructured Materials <i>Pravin S. Shinde and Shanlin Pan</i>	59
5. Nanostructured Materials Using Microemulsions <i>Sonalika Vaidya</i>	83
6. Methods of Manufacturing Composite Materials <i>Anton Yegorov, Marina Bogdanovskaya, Vitaly Ivanov and Daria Aleksandrova</i>	91
7. Quantum Dots and Their Synthesis Processes <i>Prashant Ambekar and Jasmirkaur Randhawa</i>	114
8. Chemical Vapor Deposition (CVD) Technique for Nanomaterials Deposition <i>Abhishek K. Arya, Rahul Parmar, K.S. Gour, Decio B. de F.N., R. Gunnella, J.M. Rosolen and V.N. Singh</i>	125
9. CVD Growth of Transition Metal Dichalcogenides MX₂ (M: Mo, W, X: Se, S) <i>Alejandro Fajardo Peralta, Jose Valenzuela-Benavides, Nestor Perea-Lopez, and Mauricio Terrones</i>	147

10. Metal Oxide/CNT/Graphene Nanostructures for Chemiresistive Gas Sensors	163
<i>Sanju Rani, Manoj Kumar, Yogesh Singh, Rahul Kumar and V.N. Singh</i>	
11. Chemical Route Synthesis and Properties of CZTS Nanocrystals for Sustainable Photovoltaics	195
<i>Shefali Jain, Pooja Semalti, Vidya Nand Singh and Shailesh Narain Sharma</i>	
12. Surface Modification of Glass Nanofillers and Their Reinforcing Effect in Epoxy-Based Nanocomposites	217
<i>Lifeng Zhang and Demei Yu</i>	
13. Gas Sensor Application of Zinc Oxide	228
<i>Bharat R. Pant and Ahalapitiya H. Jayatissa</i>	
14. Titanium Dioxide as A Photo Catalyst Material: A Review	241
<i>Yogesh Singh, Sanju Rani, Manoj Kumar, Rahul Kumar and V.N. Singh</i>	
<i>Index</i>	255

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2.	Dr. Mrs. Snehal Narale	Programming in C	NA	NA	National	9789382683414	M./s. Rajani Prakashan
3.	Dr. Mrs. Vaishali Meshram	Textbook of Chemistry Sem III	NA	NA	National	818917866-0	Central Techno Publications, Nagpur

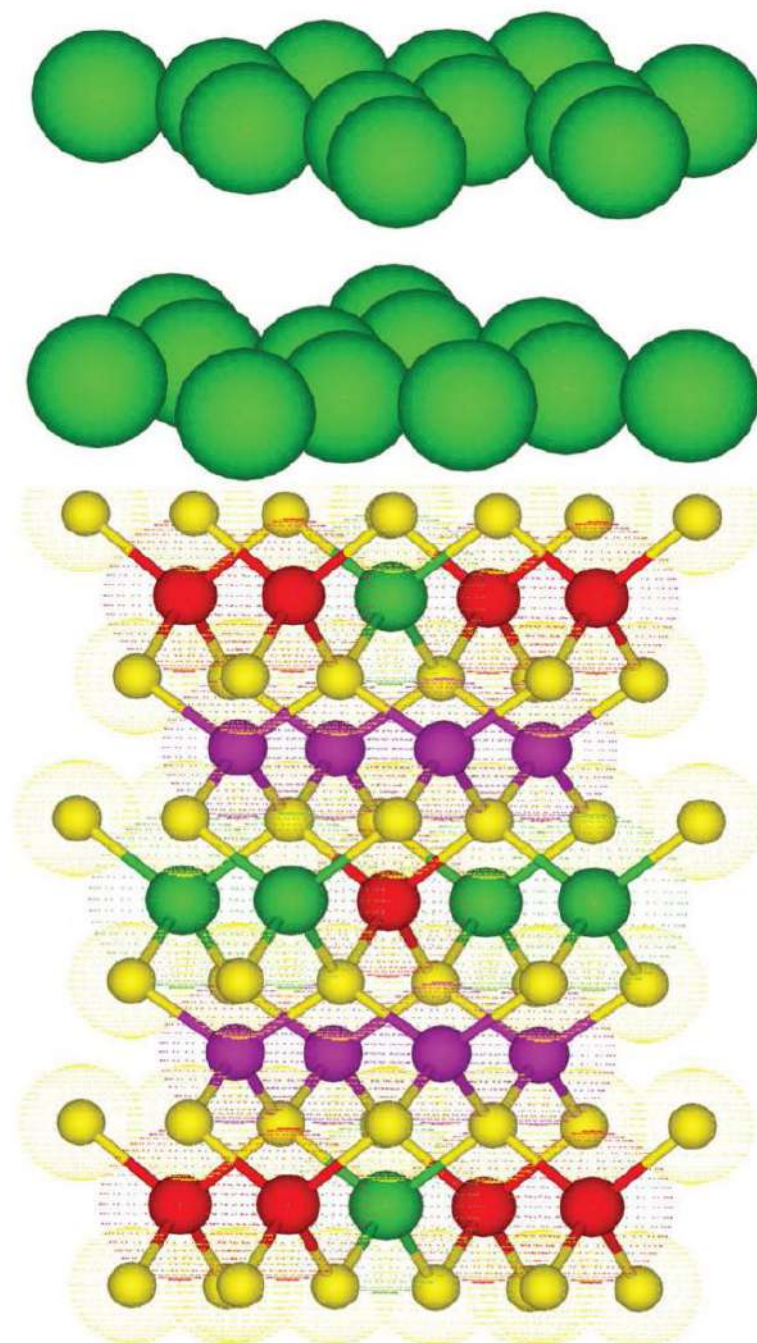
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Chemical Methods for Processing Nanomaterials

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Contents

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1. Chemical Methods for Processing Carbon Nanomaterials <i>Sehmus Ozden</i>	1
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12. Surface Modification of Glass Nanofillers and Their Reinforcing Effect in Epoxy-Based Nanocomposites	217
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<i>Index</i>	255

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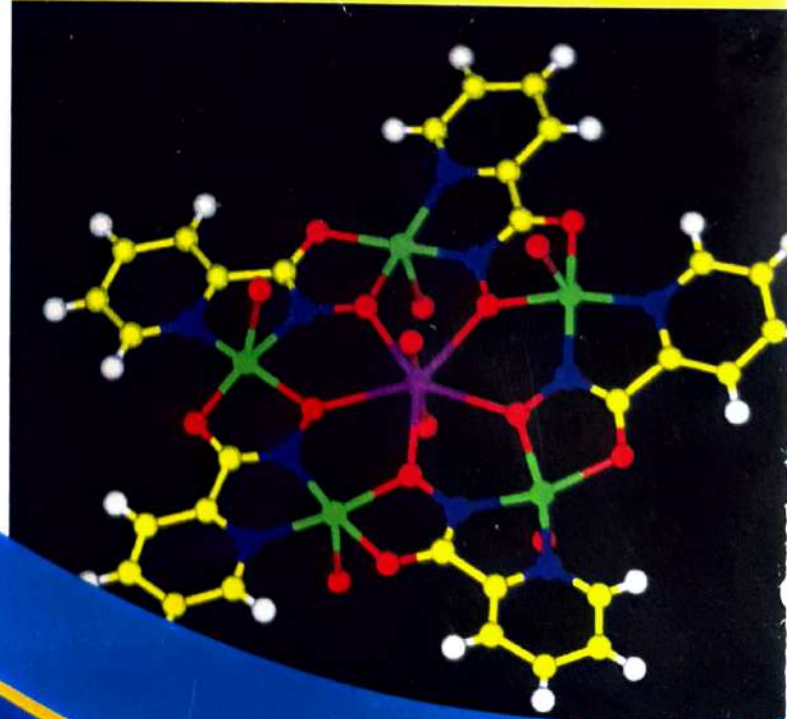
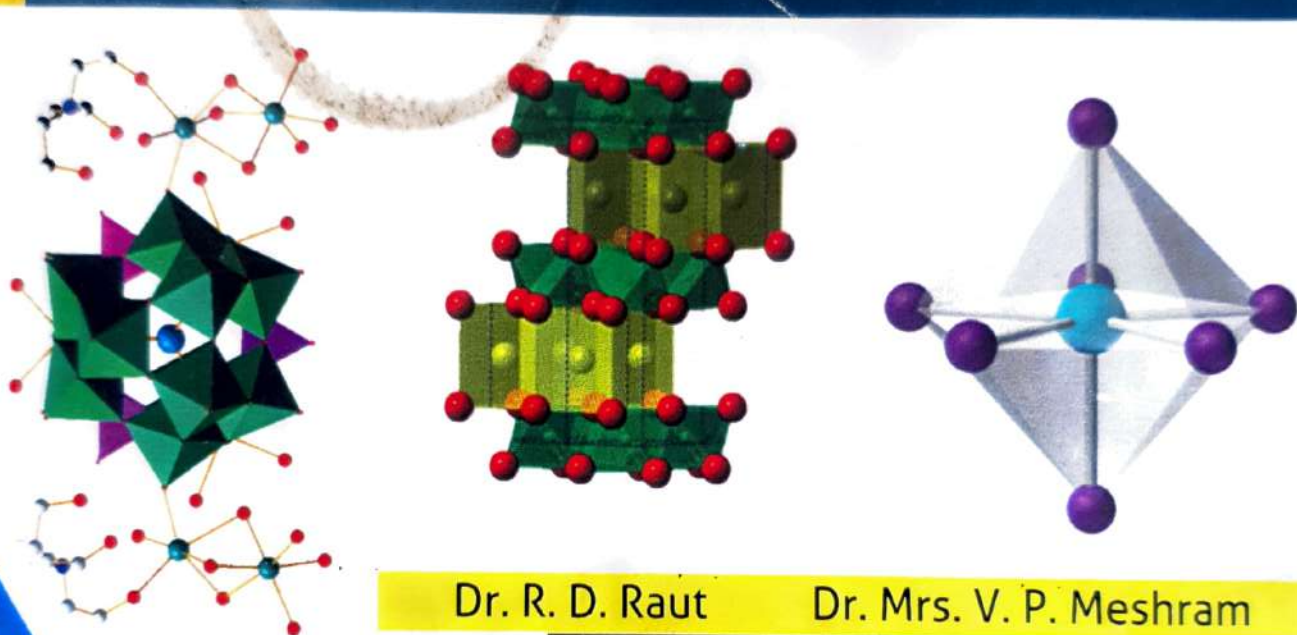
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3.3.2

**Number of books and chapters in edited volumes/books published
and papers published in national/ international conference
proceedings per teacher during the years 2017-18**

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**3.3.2 Number of books and chapters in edited volumes/books published
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