

IEI Epitome

Volume 8 | Issue 3 | March 2023

A Century of Service to the Nation

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Mr S Bagchi, Mr P Barik, Ms P Nath, Mr S K Mishra

Design & Outlay

Ms H Roy

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The information contained in IEI Epitome has been prepared solely for the purpose of providing information about the members of IEI to interested parties, and is not in any way binding on IEI.

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Website : <http://www.ieindia.org>

Notification for IEI R&D Grant-in-Aid

Volume 8 | Issue 3 | March 2023

To promote appropriate technology, assist in building up design & research talents and, most importantly, to help in nurturing potential R&D venture amongst engineering students pursuing Diploma/UG/PG/PhD courses. The Institution of Engineers (India) had instituted the R&D Grant-in-Aid program way back in 2001.

Every year, the Institution invites applications for funding industry-oriented R&D projects and research initiatives aimed at improving the life-style of common people from engineering students pursuing full time Diploma/UG/PG/PhD engineering program in AICTE/UGC/NAAC approved Institutions / Colleges / Universities. The application form and guidelines are available in our website <https://www.ieindia.org>. The projects should be carried out under the guidance of faculty members who are Corporate Members of IEI. Membership criteria for student(s), guide(s) and Institution(s) are as follows:

| Project Category | Student/Applicant Membership | Guide(s) Membership | Institutional Membership |
|------------------------------|---|---------------------|---|
| 1. Diploma | Exempted [Membership of Student Chapter is desirable] | AMIE/MIE/FIE | Not Mandatory |
| 2. UG (BE/BTech/ Equivalent) | 'Student Member' (SMIE) | AMIE/MIE/FIE | Applicant's Institute should preferably be an Institutional Member with NBA/NAAC Accreditation or valid NIRF Rank |
| 3. PG (ME/MTech/ Equivalent) | AMIE/MIE/FIE | MIE/FIE | Applicant's Institute should preferably be an Institutional Member with NBA/NAAC Accreditation or valid NIRF Rank |
| 4. PhD | AMIE/MIE/FIE | MIE/FIE | Applicant's Institute should preferably be an Institutional Member with NBA/NAAC Accreditation or valid NIRF Rank |

The soft copy of the duly filled-up applications (in editable format), as per the pro-forma available in our website www.ieindia.org, should be sent through email to research@ieindia.org and one printed copy of the same should reach the following address:

Director (Technical)
The Institution of Engineers (India)
8 Gokhale Road, Kolkata 700 020

Kindly go through the guidelines (visit link: <https://www.ieindia.org/webui/IEI-Activities.aspx#RnD-Initiative>) before filling up the application.

Notification for IEI Young Engineers Award 2023-24

Volume 8 | Issue 3 | March 2023

The Institution of Engineers (India) is a multi-disciplinary professional body of engineers with 15 engineering disciplines and over 9,00,000 members in India and abroad. The Institution was established in 1920 and was incorporated by Royal Charter in 1935. It has been in the forefront of engineering profession addressing the social engineering problems for progress of the country. IEI functions among professional engineers, academicians, research workers to update their professional knowledge through continuous professional development. IEI, with its large international linkages and a network of 125 Centres in India and six Overseas Chapters, has built up wide reach and large infrastructure to meet its objectives of promoting engineering in all aspects.

IEI, with a view to promote the pursuit of excellence in the field of engineering, has instituted '**IEI Young Engineers Award**'. The Award consists of a Plaque and a Certificate. The purpose of the Award is to recognize outstanding achievements /contributions made by young engineers in engineering research, excellence in engineering technology development, technology transfer, etc. Any engineer citizen of India **not older than 35 years of age as on March 31, 2023** is eligible for the Award. The IEI Young Engineers Award is presented to awardees for all the 15 Engineering Divisions of the IEI during the respective National Conventions. The awardees attending the National Convention will be provided with free accommodation & their travelling expenses (AC-3 Tier train fare by shortest route) will be reimbursed on production of original documents.

The last date of receipt of application for 'IEI Young Engineers Award 2023-24' has been extended. The cut off date will be intimated in the next issue.

The Application Proforma may be downloaded from IEI website (<https://www.ieindia.org>). Soft copy of the filled-in application proforma should be forwarded to award@ieindia.org. Six copies of the duly filled application form, along with all supporting documents, endorsed by appropriate authority should be sent to the below mentioned address:

Director (Technical)
The Institution of Engineers (India)
8 Gokhale Road, Kolkata 700020

The envelope containing the application should be superscribed at the top as '**IEI Young Engineers Award 2023-24**' and name of the engineering division under which the applicant desires to be considered for the Award.

Member in the News

Volume 8 | Issue 3 | March 2023



Prof Balachandran Ruthramurthy, FIE

Professor

Department of Electronics and Communication Engineering, School of Electrical Engineering and Computing, Adama Science and Technology University, P.O.Box No. 1888, Adama, Ethiopia.

✉: balachandran.ruthramurthy@astu.edu.et

Prof Balachandran Ruthramurthy is the one of the Patentee in respect of the application of such design to “**Smart Digital Flow Control Valve**”.

Design No: 6259177

Application date: 30 January 2023

Grant date: 6 February 2023

Publication date: 7 February 2023

Description: Smart Digital Flow Control Valve

Classification: Class - 14 - Recording, Telecommunication or Data Processing Equipment

Sub class - 02 - Data Processing Equipment as well as Peripheral Apparatus and Devices

Other Owners: Dr Vinayak Malik, Dr Bindu Kumar Karthikeyan, Mr Prasoon Prasenan Prameela, Dr Raviteja Surakasi & Mr Prem Charles Immanuel

Issuing Authority: UK Design Patent



Dr Krishna Kumar Singh Tomar, MIE

Sub Divisional Officer

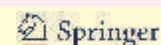
Uttar Pradesh Power Corporation, Kanpur Nagar, Uttar Pradesh

✉: kkstomar@gmail.com

Mr K K S Tomer obtained the Degree of **Doctor of Philosophy** in **Electrical Engineering** under the Supervision of Dr S N Singh from IIT Kanpur on **December 2021**.



IEI-Springer Journal



ISSN Print 2250-2149
ISSN Electronic 2250-2157

Series A

CiteScore 2021

1.6

Google Scholar h5 Index 2021

16



ISSN Print 2250-2106
ISSN Electronic 2250-2114

Series B

CiteScore 2021

1.6

Google Scholar h5 Index 2021

17



ISSN Print 2250-0545
ISSN Electronic 2250-0553

Series C

CiteScore 2021

2.3

Google Scholar h5 Index 2021

20



ISSN Print 2250-2122
ISSN Electronic 2250-2130

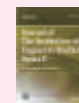
Series D

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13



ISSN Print 2250-2483
ISSN Electronic 2250-2491

Series E

CiteScore 2021

1.3

Google Scholar h5 Index 2021

11



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Publication by Members

Volume 8 | Issue 3 | March 2023

Papers published in the Journals / Proceedings



Dr Kudiyaaran Swamynathan, FIE

Scientific Officer / E

Electrical Group, Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI) (A Government of India Enterprise), Department of Atomic Energy (DAE), Kalpakkam, Tamil Nadu

✉ kudiyaaran@rediffmail.com; skarasan_bhavini@igcar.gov.in

Title of Paper: Implementation of Optimal Oil Flushing Methodology for Nuclear Steam Turbo Generator Oil Circuits

SN Applied Sciences, Springer, 5(2), 2023, ISSN:2523-3971

DOI: <https://doi.org/10.1007/s42452-023-05282-2>

Co-authors: Levankumar Lakshmanaraj & Mahesh Ramalingam

Abstract: The first turning gear operation is regarded as a significant milestone in the overall activities of Turbine Generator system commissioning. To accomplish this critical goal, the lube oil circuit must be clean and free of all type of contaminants. The purpose of this paper is to elaborate on the various flushing tactics used in the Prototype Fast Breeder Reactor 500 MW Turbo Generator (TG) oil systems, to understand the factors that influence oil circuit flushing, the difficulties encountered during flushing, and to optimise the flushing process of TG oil circuits. Also a simple method was used in this paper to determine the minimum amount of oil required to begin flushing and the make-up requirements of lube oil at various stages of flushing. The percentage of oil passing through the cooler and cooler bypass line during the thermal shocking process was also determined using an energy balance approach. Based on TG oil circuit commissioning experience, an optimised methodology for completing the TG oil circuits flushing exercise is also proposed. This study demonstrates that the cooling and heating times of lube oil can be controlled during oil flushing, resulting in an increase in the number of thermal shocks per day and a significant reduction in flushing time.

Keywords: Turbo Generator; Oil Flushing; Optimization; Cooler Bypassing; TG Oil Circuits; Thermal Shocks



Dr Jitendra Mohan Giri, FIE

Head

Department of Mechanical Engineering, Lloyd Institute of Engineering and Technology, Greater Noida, Uttar Pradesh

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Title of Paper: Simulated Annealing and Its Applications to Mechanical Engineering: A Review

International Journal of Innovative Research in Computer Science & Technology, 11, Special Issue -1, 2023, pp 09-14, ISSN: 2347-5552, Papers presented in IEEE UP Section India (Technically Sponsor) National Conference on Digital Transformation through Intelligent Computing Systems and Methods (NCDICM 2023)

DOI: <https://doi.org/10.55524/NCDICM.2023.11.1.3>

Abstract: This work focuses on the significant family of stochastic approaches for global optimization known as simulated annealing (SA), which is based on the key concept of annealing, which describes the cooling of a solid until it reaches the configuration of lowest energy. This paper presents a review of simulated annealing applications meant to solve many problems in the field of mechanical engineering.

Keywords: Simulated Annealing; Optimization; Meta-heuristics; Mechanical Engineering



Dr Anil Kumar Chepala, MIE

Scientist-E

RCS Division, TDWT, ETC Building, Naval Science and Technological Laboratory, Visakhapatnam, Andhra Pradesh, DRDO, Ministry of Defence, Government of India

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Title of Paper: Uniform Linear Antenna Array Beamsteering Based on Phase-Locked Loops

Electronics, MDPI, 12(4), 2023, ISSN 2079-9292

DOI: <https://doi.org/10.3390/electronics12040780>

Co-authors: Vincent Fusco, Umair Naeem & Adrian McKernan

Abstract: Phased arrays are extensively used in many modern beam-scanning applications such as radar and satellite communications. Electronic beam scanning makes phased arrays an important aspect of modern antenna array systems. This Tutorial aims to promote the basic understanding of the principle and operation of a phased array to general undergraduate students. This paper starts with a discussion on the theory of operation and some basic definitions of antenna parameters followed by derivations of two-element and N-element array patterns and, finally, a five-element array design. The essential hardware based on Phase-Locked Loops (PLLs) as phase controllable RF sources required to build an array and the basic tools required for software and measurement set-up to demonstrate the beam-scanning phased array operation are presented. This enables students to quickly understand and set-up an experiment to verify the phased array operation with commercial off-the-shelf components. In addition, the hardware and software necessary for autonomous control are discussed. By combining basic concepts of phase arrays with a series of simple coding and intuitive laboratory experiments, students can easily understand the Uniform Linear Array (ULA) scanning operation..

Keywords: Linear Antenna Arrays; Phased Array; Phase-Locked Loops; Beam Steering; Tutorial; Education



Dr Ajay Kumar Kushwaha, AMIE

Associate Professor

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Title of Paper: Voltage-Mode and Current-Mode Universal Filter Using IC LT1228

Proceedings of Second International Conference on Computational Electronics for Wireless Communications, Lecture Notes in Networks and Systems, Springer, Singapore, 554, 2023, pp 1-10, Print ISBN: 978-981-19-6660-6, Online ISBN: 978-981-19-6661-3, Electronic ISSN: 2367-3389, Print ISSN: 2367-3370

DOI: https://doi.org/10.1007/978-981-19-6661-3_1

Co-authors: Ashok Kumar, Ashish Mishra & Ashutosh Singh

Abstract: The novelty of the paper is an electronically tunable second-order voltage-mode and current-mode universal filter employing commercially available IC LT1228 and passive components. The low-pass (LP), high-pass (HP), band-pass (BP), notch, and all-pass (AP) responses are realized using voltage-mode and current-mode second-order universal filters. The DC bias currents can be electronically modified to change the natural frequency of the presented arrangement. Furthermore, the voltage and current gain of filters can be adjusted. The Cadence OrCAD PSpice simulation is used to verify the theoretically described performance of the proposed filters.

Keywords: Universal Filter; LT1228 IC; Voltage Mode (VM); Current Mode (CM); Active Building Block (ABB)



Mr Sai Sarath Kruthiventi, AMIE

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Title of Paper: Exergy and Performance Analysis of Low GWP and Non-flammable HFO based Refrigerant Mixtures as Alternatives to R134a

Thermal Science and Engineering Progress, Elsevier, 39, 2023, ISSN:2162-8246

DOI: <https://doi.org/10.1016/j.tsep.2023.101691>

Co-authors: Nagarjuna Kumma & S S Harish Kruthiventi

Abstract: R1234yf and R1234ze(E) can be potential retrofits for the conventional refrigerants used in domestic refrigerator provided their flammability is controlled. In this study, the inerting effect of the dilutants R125, R134a, R227ea and R245fa on R1234yf and R1234ze(E) based ternary mixtures is studied theoretically. R152a, R161 and RE170 are used as the secondary refrigerants with R1234yf and R1234ze(E) based ternary mixtures. Minimum inerting concentration (most important parameter that decides the flammability of the mixture) is estimated with thermal balance method (TBM) and modified thermal balance method (MTBM) for the selected mixtures. The calculated MIC values are compared with 86 experimental data points (both binary and ternary) available in the literature. It is calculated that TBM and MTBM predicted the minimum inerting concentration values (for a majority of the mixtures) within $\pm 30\%$ and $\pm 8\%$ respectively when compared with the experimental data. The COP ratios of the non-flammable mixtures (that are proposed with MTBM) are estimated and is found to be maximum at a volumetric cooling capacity ratio close to 0.8. It is also calculated that the exergy efficiency varied between 0.54 and 0.64 for the low GWP mixtures (M1 to M5) proposed in this study.

Keywords: Hydrofluoroolefins (HFOs); Minimum Inerting Concentration; Ternary Mixture; Low GWP



Mr Chandam Thoisana Singh, AMIE

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Title of Paper: Basic Applications using FTFNTA

International Journal of Novel Research and Development, IJ Publication, 8(1), 2023, pp d310-d313, ISSN: 2456-4184

DOI: <http://doi.one/10.1729/Journal.32862>

Abstract: This research paper presents a design of a voltage mode resistorless 1st order and 4th order high pass filter, inverting amplifier and a non-inverting amplifier using an analog building block called FTFNTA (Four Terminal Floating Nullor Transconductance Amplifier). The functionality of the CMOS based FTFNTA is integrated with a $0.18\ \mu\text{m}$ Taiwan Semiconductor Manufacturing Company (TSMC) CMOS technology. Also, the FTFNTA can be realized by commercially available (ICs) AD844 and CA3080 two numbers each respectively as well a simulation is done in PSpice to test the functionality and analyze the proposed circuit design. With the use of this analog building block called FTFNTA which is the advanced version of the previously available FTFN reduces the size & complexity of the circuit as well enhances the performance of the circuit.

Keywords: FTFNTA (Four Terminal Floating Nullor Transconductance Amplifier); AD844; CA3080; Voltage Mode; 1st Order and 4th Order High Pass Filter; Inverting and Non-Inverting Amplifier



Mr Mohd Esa, AMIE

Senior Research Fellow (SRF)

Defence Research and Development Laboratory (DRDL), Kanchanbagh,
Hyderabad, Telangana

✉ zmohdesa@gmail.com

Title of Paper: Determination of Resonance Frequency of Air Column for the Measurement of Pressure using Pressure Transducers

2022 IEEE International Conference on Computing, Communication, and Intelligent Systems (ICCCIS), IEEE, 2022, pp 277-283, Electronic ISBN: 978-1-6654-6200-6, Print on Demand (PoD) ISBN: 978-1-6654-6201-3

DOI: <https://doi.org/10.1109/ICCCIS56430.2022.10037631>

Co-authors: Samvirt Ji Kanwar, Ashish Kumar Nanda & Padma Lochan Bora

Abstract: In aerospace applications static tests are carried out for design qualification and validation. During tests different types of parameters are measured and acquired. Performance analysis of the system under test is carried out using the acquired data. Pressure is a very important parameter used for performance analysis of such aerospace related systems and subsystems. Pressure transducers of different types are used for measuring pressure parameter. Pressure transducers are available with cavity or without cavity. Based on the type of transducer the response varies and the same is modeled differently. This paper presents the Helmholtz resonator and Organ pipe models for theoretical analysis of the performance of pressure transducer with inlet tubes. Using these analytical models, resonance frequency and damping ratio of pressure transducer with different sizes of inlet tubes are estimated. Dynamic calibration of cavity type pressure transducer is carried out to obtain second order response. Inlet tube of dimensions $6 \times 4.1 \times 51$ mm is used for this purpose. The experimental setup uses an Aronson calibrator, inlet tube, nitrogen gas cylinder, pressure transducer and an acquisition system. Pressure transducer is mounted on the inlet tube which in turn is connected to the calibrator. From the experimental data, dynamic parameters are evaluated using percentage overshoot method. Theoretical and experimental results are used to calculate percentage error.

Keywords: Dynamic Calibration; Pressure Transducer; Connecting Tube; Resonance Frequency; Damping Ratio

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- Membership of recognised professional engineering institution/ association
- Maintained Continued Professional Development (CPD) at a satisfactory level

For details pls visit the following link :

https://www.ieindia.org/webui/IEI_PE_Certification.aspx

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The eligible candidate can submit application in the prescribed format to: The PE Cell, The Institution of Engineers (India), 8 Gokhale Road, Kolkata 700020
For any query and assistance, please send email to: pe@ieindia.org

Publication by Members

Volume 8 | Issue 3 | March 2023



Dr Sagar N V S S, MIE

Faculty

Design Prototyping Centre & Mechanical Division, Engineering Staff College of India (ESCI), Hyderabad, Telangana

Email: nvsssagar@gmail.com

Title of Paper: Design and Development of Unibody Quadcopter Structure Using Optimization and Additive Manufacturing Techniques

Designs, MDPI, Special Issue 'Unmanned Aerial System (UAS) Modeling, Simulation and Control', 6(1), 2022, ISSN: 2411-9660

DOI: <https://doi.org/10.3390/designs6010008>

Co-authors: Balasubramanian Esakki, Lung-Jieh Yang, Chandrasekhar Udayagiri & Kameswara Sridhar Vepa

Abstract: Quadcopters represent rotary wing configuration of the Unmanned Aerial Vehicles (UAVs) with immense application potential in industrial and strategic contexts. Tradeoff between flight endurance and payload capacity renders design optimization of UAVs a critical activity with substantial impact on the application possibilities. Among the structural parts of a typical Quadcopter, the central body frame constitutes major portion of the total weight. The present study aims at reduction of the frame weight while conforming with structural integrity requirements, through an integrated approach involving topology optimization, part consolidation and design for additive manufacturing (DFAM). Commercial UAV designs consist of multiple parts and fastening elements that necessitate considerable time and effort for assembly. This study reengineers the frame as a monocoque structure with desirable outcomes of weight reduction and less assembly time. The reengineered Quadcopter structure is manufactured through Fused Filament Fabrication (FFF) and characterized with reference to structural, vibrational and fatigue characteristics. Concomitant application of modal analysis, computational fluid dynamics and wind tunnel testing reveals close match between theoretical estimates and experimental results. Assembly and field trials of the monocoque Quadcopter structure affirm betterment of operational superiority and endurance vis-a-vis commercial UAV designs.

Keywords: Quadcopter; Topology Optimization; Fused Filament Fabrication; Design for Additive Manufacturing and CFD Analysis



Project Management Associates Weekend Programme



International Project Management Association

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Next batch of on-line learning sessions on Project Management Competence Building (PMCB) based on ICB Version 4, knowledge base for IPMA Level C and Level D by our Learning partner PMA is from 7, 8, 14, 15 April 2023. The relevant material is available in the link <https://www.pma-india.org/brochures>.

Exam Dates for Level C: 22, 28 & 29 April 2023

Exam Dates for Level D: 22 April 2023

Exam Venue: Secure and Seamless Online Exam & Assessment

For more details, please contact:

Arvind Agarwal, Head, PMA Cert (Certification Body)

Project Management Associates

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Tel: 011 41421511 Mob: +91 9711631534-35/39, 9840432229, Website: www.pma-india.org, Email: info@pma-india.org

We would like to thank our erudite members for sharing their professional achievements through the IEI Epitome and making the content more abounding and at the same time inspiring many others to share their accomplishments as well. To streamline the process and make it convenient for the member to give their inputs we would like to obtain the information in a more structured and comprehensive manner. We would request our members to send the details of their achievements as per the appended formats only.

FORMAT FOR ACHIEVEMENT BY MEMBERS

A passport size
color photograph
(scanned image)

| | |
|--|--|
| (i) Prefix (Er/Dr/Prof) | |
| (ii) First Name | |
| (iii) Middle Name (if any) | |
| (iv) Surname (Last Name) | |
| (v) Email and Mobile Number | |
| (vi) Designation | |
| (vii) Organization of affiliation | |
| (viii) Membership No (please use the prefix F/M/AM as the case may be) | |
| (ix) Details of Award/Achievement# | |
| (x) Month & Year of Achievement/ Date of Achievement | |
| (xi) Supporting Documents/links [which are clearly indicative of the incumbent's achievement(s)] | |

Reporting of Award of stipend/fellowship at PG/PhD level and awards from esoteric events/communities may be avoided.

FORMAT FOR PATENT / DESIGNS / TRADE MARKS / GEOGRAPHICAL INDICATIONS BY MEMBERS

A passport size
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| | |
|---|--|
| (i) Prefix (Er/Dr/Prof) | |
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| (iii) Middle Name (if any) | |
| (iv) Surname (Last Name) | |
| (v) Email and Mobile Number | |
| (vi) Designation | |
| (vii) Organization of affiliation | |
| (viii) Membership No (please use the prefix F/M/AM as the case may be) | |
| (ix) Tick the appropriate BOX | <input type="checkbox"/> Patent <input type="checkbox"/> Designs <input type="checkbox"/> Trade Marks <input type="checkbox"/> Geographical Indications |
| (x) Issuing Authority | |
| (xi) Serial No | |
| (xii) Patent No | |
| (xiii) Date of filing (DD/MM/YYYY) | |
| (xiv) Date of Grant (DD/MM/YYYY)* | |
| (xv) Patentee | |
| (xvi) Details of Patent | |
| (xvii) Term for which the above (ix) has been granted | |

* Copy of Certificate of the Grant of Patent

FORMAT FOR PUBLICATION(S) BY MEMBERS — PAPERS

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| (v) Email and Mobile Number | |
| (vi) Designation | |
| (vii) Organization of affiliation | |
| (viii) Membership No (please use the prefix F/M/AM as the case may be) | |
| (ix) Title of Paper | |
| (x) Name of Journal/Proceeding/Technical Volume | |
| (xi) Volume No (Not required for Indian Engineering Congress) | |
| (xii) Issue No (Not required for Indian Engineering Congress/Annual Technical Volumes of IEI) | |
| (xiii) Theme (Only for Technical Volumes of IEI) | |
| (xiv) DOI: (Not required for Indian Engineering Congress/Annual Technical Volumes of IEI) | |
| (xv) ISSN | |
| (xvi) Date of Publication (Date-Month-Year) | |
| (xvii) Co-authors (if any) | |
| (xviii) Abstract in full | |
| (xix) 5/6 Keywords | |
| (xx) Supporting Documents/links [which are clearly indicative of the incumbent's achievement(s)] | |

** publications in local seminar, conference and symposia will not be accounted*

FORMAT FOR PUBLICATION(S) BY MEMBERS — BOOKS/ BOOK CHAPTERS

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| | |
|--|--|
| (i) Prefix (Er/Dr/Prof) | |
| (ii) First Name | |
| (iii) Middle Name (if any) | |
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| (vii) Organization of affiliation | |
| (viii) Membership No (please use the prefix F/M/AM as the case may be) | |
| (ix) Title of Book | |
| (x) Title of Book Chapter | |
| (xi) Book Chapter Number | |
| (xii) Publisher Details | |
| (xiii) ISBN | |
| (xiv) Date of Publication (Date-Month-Year) | |
| (xv) Co-authors (if any) | |
| (xvi) About the book (100-150 words) | |
| (xvii) Supporting Documents (complimentary copies for IEI Headquarters)/links [which are clearly indicative of the incumbent's achievement(s)] | |

** accommodate works published in journals/reputed conference proceedings/books for the last one year*

The Institution of Engineers (India) reserves a coveted privilege in being the largest multi-disciplinary professional body of engineers encompassing 15 engineering disciplines with a Corporate membership of over 2.4 lakhs maintaining a national/international presence through hundred twenty five Centres and six Overseas Chapters, Fora's and Organ (Engineering Staff College of India). The Institution has been disseminating the various information through IEI-Epitome and other publications.

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CONTINUING PROFESSIONAL DEVELOPMENT PROGRAMMES (CPDP) FOR THE MONTH OF APRIL 2023

| Sl. No. | Name of the Course | Scheduled Dates |
|---------|--|-----------------|
| 1. | Bio Medical Waste Management – Handling & Safe Disposal Options with New Rules 2016 | 04 – 06 Apr 23 |
| 2. | Mechanization & Technology in Underground and Opencast Mining for Improved Productivity and Safety | 04 – 06 Apr 23 |
| 3. | Advances in Design & Optimization of UAV's for Industrial Applications (Defence, Mining & Construction) | 10 – 13 Apr 23 |
| 4. | Urban Planning, Green Cover and Biodiversity | 11 – 13 Apr 23 |
| 5. | General Safety in Mining - Risk Assessment, Accident Prevention, Safety Management Plan, Safety Audit, Legislation, ISO- 31000 | 17 – 21 Apr 23 |
| 6. | Dam Safety Guidelines - Monitoring and Protection Measures and Emergency Action Plan | 17 – 21 Apr 23 |
| 7. | Power System Protection - Principles, Protection Relays and Fault Analysis | 18 – 21 Apr 23 |
| 8. | Advanced technologies-based Water and Waste Water Treatment for Zero Discharge Compliance | 19 – 21 Apr 23 |
| 9. | Cyber Security Best Practices for Managers & Executives | 19 – 21 Apr 23 |
| 10. | Modern Methods used Demolition of Buildings | 24 – 28 Apr 23 |
| 11. | Advanced Welding Processes, NDT Techniques and their defect Analysis (Theory and Practical Orientation) | 24 – 28 Apr 23 |
| 12. | Power Plant Cooling Towers, Compressors- Performance Optimization | 24 – 26 Apr 23 |
| 13. | Coating & Paint Technology | 25 – 27 Apr 23 |
| 14. | Implementing the Net Zero | 26 – 27 Apr 23 |
| 15. | Project Management using MS Project 2019 | 26 – 28 Apr 23 |
| 16. | General Network Access (GNA) and Power Trading - ABT Scenario (Online) | 26 – 28 Apr 23 |