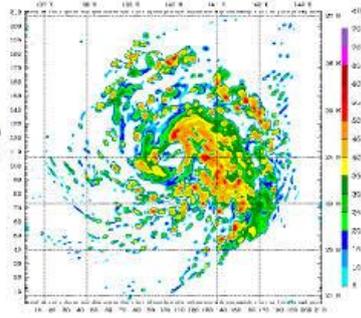


International Conference of Advance Research and Innovation (ICARI-2020)

19th January 2020



Organized By

**Meerut Institute of Engineering and Technology
(www.miet.ac.in)**

With

**International Journal of Advance Research and
Innovation (www.ijari.org)**

Venue

Institution of Engineers (India)

Delhi State Center (Engineer Bhavan)

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Venue

**Institution of Engineers (India)
Delhi State Centre, (Engineers Bhawan)
2 Bahadur Shah Zafar Marg, New Delhi
January 19, 2020**





Message from Chairman Desk

It is a very great pleasure for me to welcome you on behalf of the Conference Committee, to this **International Conference Advance Research and Innovation (ICARI-2020)**. I am glad that we can have this multinational Conference on **19th Januray 2020** at **Delhi State Center, Institution of Engineers (India) Enginners Bhavan, 2 BS Zafar Marg in Delhi-02**. The call for papers had an overwhelming response. Many distinguished specialists from all over the world submitted more than 200 abstracts and the International Scientific Committee was forced to assesses and include them to 10 Divisions and their sessions. This book contains 125 abstracts of received manuscripts with ISBN number. The text of received manuscripts will be published by the **International Journal of Advance research and Innovation** with ISSN number. Online Proceeding will be published by Elsevier-

SSRN.

There is the hope that the Conference Proceedings will serve as a comprehensive compilation of the present knowledge and experience. It will be used by technocrats, entrepreneurs, architectures, managements and industries, who are concerned with the subjects presented at the International Conference ICARI-2020.

We are confident that your active participation in the Conference and its social events will enable you to take home one of the most precious commodities a meeting like this can offer, namely human contacts. For your convenience in meeting old friends and making new ones, and for your enjoyment, we have arranged Sunday for the noble cause.

On behalf of the Executive Committee of ICARI 2020, I wish to thank all the authors, invited lecturers, session chairman, members of the International Scientific Committee, National coordinators and numerous others who helped to shape the content of this conference. I would like to thank our Chief Guest Dr. SK Varsheny, Scientist G (Advisor) from Department of Science and Technology (Ministry of Science and Technology), DRDO (Ministry of Defense) from Govt. of India, with administrative and organizational works were the prerequisite and contribute for a successful conference.

Shri. Vishnu Saran
(Chairman, City Education and Social Welfare Society, Meerut)
Meerut Institute of Engineering & Technology, Meerut (UP)

Message from Vice Chairman Desk



With great pleasure and enthusiasm fervor, I welcome to our prestigious engineering college Meerut Institute of Engineering and Technology on the occasion of International Conference of Advance Research and Innovation (ICARI-2020) organized on 19th January 2020. The conference is a unique opportunity to future researchers, academicians, technocrats and industries person. This conference welcomes all scientists, engineers, technocrats and researchers from all walks of society to share their knowledge and wisdom for exploring solution of current and future challenges. This platform provides an international forum for researchers to exchange of ideas in

recent advances on various aspects of theories, analysis, experimentation and computational methods in science, technology and management etc.

This approach of multidisciplinary and interdisciplinary is the need to today's world and current scenario.

I welcome all participants for making it successful with the presence and time. I want to pay my best wishes to new and young researchers for bright future. I am thankful to the Prof. (Dr.) SK Varshney, Scientist G (Advisor) from DST. Dr. Manoj Kumar Patairiya Scientist G, DST, Dr. RK Pandey- IIT Delhi, Dr. Amitanshu Pattnaik from DRDO, Dr. HEEChang Lim from PNU, South Korea, Dr. Archana Singh, Professor, DTU really added the value with their support. Sh. Pradeep Chaturvedi, FIE, Council Member of Institute of Engineers (India) open a new path of current science and technology concerning with Research and Innovation. I will all the success to all my MIET family member for organizing such event and make a start of this New Year 2020 with energy. Hope all goes with good memories of ICARI-2020 and want your active support in coming future.

Shri. Puneet Agrawal

(Vice-Chairman, City Education and Social Welfare Society, Meerut)

Meerut Institute of Engineering & Technology, Meerut (UP)



Message from Director Desk

Yearning for knowledge, an insatiable desire to know the unknown, inordinate passion for the unlimited and an innate urge to improve- this is all that defines a curious mind. With this intellectual movement and an innovative move, I welcome you to the '**International Conference of Advance Research and Innovation (ICARI-2020)**.' As the theme specifies, it is a multidisciplinary dialogue, breaking both the barriers of content and boundaries of place as being international in scope.

Plagiarism should be strictly avoided and ethics of publication should be followed by every author. Addressing a comprehensive community of academicians, experts, researchers and students, this conglomeration of eminent scholars from diverse fields will highlight the importance of research and innovation and offer new insights for the future. The whole gathering will be a divine experience where the wisdom and experience of past stuffed with the advances and innovations of present will work for the bright future of the nation.

I congratulate the entire organizing team of this academic and research event who worked tirelessly and incessantly to make this event a great success. I believe that this conference will prove to be very enriching, enlightening and fulfilling for all the participants.

Dr. Mayank Garg

Director

Message from IJARI Desk

Dear Colleagues

When the goals are big and universal, when the scope touched the national and international boundaries, when the mind aspires for the unlimited, a Voice becomes the imperative need to pierce the ears. It gives me immense pleasure that ICARI-2020 has been graced with the presence of Chairman Shri-Vishnu Saran, City Education and Welfare Society, Vice Chairman Shri- Puneet Agrawal Sir. Respected Director Sir Dr. Mayank Garg and Director General JM Garga (Lt. Gen.) encouraged, motivated and energized us with great enthusiasm. I am very happy that this time our sponsors showed a positive interest in our noble cause. I am thankful to **FESTO, AarVee Chemicals** for their valuable financial support.

We got an overwhelming and very enthusiastic response from students, researchers and faculty and experts from reputed organizations. I thank Dr. APJ Abdul Kalam Technical University, Lucknow for providing us such a wonderful platform to share knowledge and wisdom. Papers from more than seven countries were received and the book of Abstract with ISBN was prepared and distributed as conference proceedings. Papers from respective authors were presented in .ppt form, from India and abroad. The proceeding will be published by Elsevier-SSRN.

I am highly thankful to for being our Chief Guest **Dr. SK Varshney, Advisor/Scientist G, DST (Ministry of Science and Technology, Govt. of India), Dr. RK Pandey (Professor, IIT Delhi), Dr. HeeChang Lim (Professor, Pusan National University, South Korea), Shri Pradeep Chaturvedi (FIE, Quality Council of India), Dr. Archana Singh, Professor, Delhi School of Management) and Dr. MK Pateiriya (Scientist G/ Advisor, DST), Dr. Amitanshu Patnaik (DTRL- DRDO)** were our **Keynote Speakers** and **Guest of Honors** and grace the occasion on 19th January 2020 with their experience, skill and knowledge.

Faculties from DTU like Dr. A Mandal, Scientist C-UGC, Dr. RS Misra, Dr. RC Singh, Dr. Rajeev Chaudhary, Dr. Ranganathan M Singari, Prof. Nand Kumar, Parinita Sinha, Naushad A Ansari, Dr. Sourabh Agrawal, Dr. Roop Lal, Dr. M Zunaid, Dr. Praveen Kumar, Faculties and students of MIET and DTU add the value in the successful complication of the event. Dr. Bharat from Rajdhani College Delhi University added the value. Researchers, academicians, Scientists, Engineers, Technocrats from premier institutes and universities gathered on this grand event to exchange ideas and innovations from all corners of India and abroad. Dr. Rajeev Sharma, Dr. Rambir Singh, Shri. Nandan Misra (CEO, Algo8i), Dr. Avijit Banerjee Director from SMT Group grace the event.

I believe that ICARI-2020 will prove to be very beneficial, enriching and fruitful and also open new fronts and vistas for future research and innovation.

Team ICARI-2020

Call for Papers

7th International Conference of Advance Research and Innovation (ICARI-2020)

On

19th January 2020 (Sunday)

Venue

**Delhi State Centre,
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Aim

International Conference of Advance Research and Innovation (ICARI-2020) is a premier international conference which aims at current challenges in science and technological advancements with research updates and innovations which is shaping the future of mankind. This conference welcomes all scientists, engineers, technocrats and researchers from all walks of society to share their knowledge and wisdom for exploring solution of current and future challenges. This platform provides an international forum for researchers to exchange of ideas in recent advances on various aspects of theories, analysis, experimentation and computational methods in science, technology and management etc.

Area of Interest

It is a **multi-disciplinary conference**, which includes all areas of Science and Technology. Innovative original research papers on topics covered under following broad areas (but not limited to).

Applied Science, Social Science, Earth Science, Management Science, Pharmaceutical Science, Computer Science and Engineering, Electronics Engineering, Mechanical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, Production Engineering, Automotive Engineering, Marine Engineering, Automation Engineering, Architecture and Building Materials, Bio-Mechanical Engineering, Chemical Science and Engineering, Material Engineering, Bio-Medical Engineering, Environmental Science and Engineering, Information Technology, Humanities, Commerce and Economics, Health Science, Medical Science, Biotechnology, Physical Science and Education, Cyber physical system, Life Science, Micro Biology, Space Science, etc.

Prospective authors may submit manuscript by E-mail address, as **doc file** attachments to:

icari.2020@miet.ac.in

Else-

bhupendra.chauhan@miet.ac.in

Visa Letter

Letter of invitation can be provided (if necessary) on request, for VISA processing.

Registration Desk

All participants must register before attending the conference. The appropriate registration fee includes conference kit, tea break and lunch break. Registration fee is nonrefundable.

Registration fee is accepted through– Draft/Cash/ NEFT –

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Exhibitors/ Sponsorships

At ICARI-2020, you will meet with representative from industry, leading scientists, research professors, research scholars from all walks of science and technologies.

Guidelines for abstract

Selection of papers presentation will be based on detailed abstract of up to 300 words and a maximum of five key words. Abstracts will be reviewed and only those abstracts approved by the reviewers will be selected. A soft copy of the abstract in Microsoft Word for Windows should reach the conference. The electronic copy should be mailed to – bhupendra.chauhan@miet.ac.in

Paper Presentation in Absentia

Those who cannot come to Delhi but wish to present paper are also encouraged to send their abstract. Papers presented in absentia are eligible for publication in conference proceedings.

Important Dates

Submission of Abstract	5 January 2020
Paper Acceptance	7 January 2020
Notification	
Last Date for full paper	10 January 2020

- ICARI 2020 will be held at Institution of Engineers (India), Delhi State Centre, (Engineers Bhawan), 2 Bahadur Shah Zafar Marg, New Delhi-110002, India. It is situated in central Delhi. Which is 4 km away from New Delhi railway station, 5 km away from Nizamuddin railway station (or Sarai Kaley Khan ISBT), 8 km away from Kashmiri Gate ISBT, 9 Km from Anand Vihar ISBT. It will be half km from Pragati Madan Metro station (subway) and 25 km from IG International Airport. Gate No-6, Station ITO, Metro Violet Line.

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Estimating the Volatility of Market Risk of Viet Nam Telecom and Education Industry after the Low Inflation Period 2015-2017

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Abstract: The Vietnam economy and telecom and education industry have gained lots of achievements after the financial crisis 2007-2011, until it reached a low inflation rate of 0.6% in 2015. Telecom and education companies face challenges in expanding Vietnam market such as pricing policy and supporting services, etc. This paper measures the volatility of market risk in Viet Nam telecom and education industry after this period (2015-2017). The main reason is the vital role of the telecom and education company group in Vietnam in the economic development and growth in recent years always go with risk potential and risk control policies. This research paper aims to figure out how much increase or decrease in the market risk of Vietnam telecom and education firms during the post-low inflation period 2015-2017. First, by using quantitative combined with comparative data analysis method, we find out the risk level measured by equity beta mean in the telecom and education industry is acceptable, i.e it is little lower than ($<$) 1. Then, one of its major findings is the comparison between risk level of telecom and education industry during the financial crisis 2007-2009 compared to those in the post-low inflation time 2015-2017. In fact, the research findings show us market risk fluctuation, measured by asset and equity beta var, during the post-low inflation time has increased moderately. Finally, this paper provides some ideas that could provide companies and government more evidence in establishing their policies in governance. This is the complex task but the research results shows us warning that the market risk volatility might be higher during the post-low inflation period 2015-2017. And our conclusion part will recommend some policies and plans to deal with it. Finding new potential markets and credit and financing policies are among directions for telecom and education companies.

Keywords: risk management, asset beta, financial crisis, telecom and education industry, policy.

T-Data Measures – A Cattellian Approach for Personality Assessment

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Abstract: Since many decades in social sciences, a traditional approach for the assessment of personality based on individuals' self-report/ questionnaires have been prevalent. The questionnaires suffers from serious limitations but still have become popular because of its popularity and ease of administration. The aim of this piece of study is to emphasize on Cattell's Objective Analytic Tests which are for different age groups and are objective in real sense i.e. non faceable. The present paper describes various kinds of Objective analytic tests and its utility and advantages in personality assessment.

Keywords: Cattel approach, T data Measurement, personality assessment.

Face Identification Using Haar Wavelet Transform

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Abstract: Face identification is the process of matching one or more people by analyzing and comparing the patterns of their faces. Algorithms for face identification typically extract facial features and compare them to a database to find the best match. Haar wavelet transform has been mainly used for image processing and pattern identification due to its low computing requirements and quality to conserve and to compact the energy of a signal. In discrete wavelet transform, an image signal can be analyzed by passing it through an analysis filter bank followed by a decimation operation. Face identification has been performed in terms of correlation coefficient, Euclidean distance and sum of absolute difference.

Keywords: Face identification, Wavelet transform, Correlation coefficient, Euclidean distance, Sum of absolute difference.

Application of lean principles for improving quality by minimizing wastes in higher education sector

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Abstract: Lean methodology was given by Toyota production system for the manufacturing sector but now a days it is applicable in many sectors like financial services, hospital services, hospitality sector etc. Various institutions/universities of higher educations will be more efficient, offering an education of equal or higher quality while at the same time decreasing their costs by using lean tools and techniques at operational, administrative and strategic level. Educational institutions now a days facing adverse competition for research funds, prestige, ratings of quality education, incubated companies, raising of funds, academicians, skilled workers, etc. Higher education urgently needed to adopt lean principles for the quality improvement, while at the same time reducing the costs (i.e. prevention cost, internal failure cost, external failure cost) and to minimize the wastes that exists in higher educational institutions/universities. Principles of lean philosophy can be implemented to improve the effectiveness of education by providing services beyond the competition and costs below the competition, and how the education will provide better prepared professionals capable to work in dynamic lean environments by developing multidisciplinary knowledge and skills. The complex relationship and interdependence between lean philosophy and education can be described by properly educated and qualified faculties and the application of lean tools and principles can improve the quality of education in universities/ Institutions. Lean strategy consisting of alignment in leadership, vision and values, execution and transformation and united peoples with united thinking. Use of lean principles such as value stream mapping, root cause analysis, standardization, respect for people, just in time (JIT), six sigma, error free improves the quality of education and minimizes the wastes (i.e. inventory waste, motion waste, transportation waste, processing waste, defect waste, overproduction waste, waiting waste) existence in the higher education sector. This paper mainly highlights the utility of lean principles for improving quality of education in institutions/universities by using continuous improvement and strategic planning for reducing wastes.

Keywords: Lean learning, education, quality, research.

A Comprehensive Review on Markov-Bernstein Type Inequalities and its Applications

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Abstract: This paper attempts to discuss the Markov-Bernstein Type Inequalities and its core applications based on its striking features and to state properties and other special aspects of it. It has numerous interesting applications in estimation theory, value theory and examination (for example, Sobolev's inequalities or Whitney type expansion problems). The inequalities of Markov and Bernstein are a fundamental theory for the proof of many inverse theorems in zeros and the theory of polynomial approximation. Above two inequalities have been the starting point of a considerable literature in Mathematics and in this article we discuss some of the research centered on these inequalities.

Keywords: Markov-Bernstein, inequality, mathematics, theory.

Multiple series identities and their hyper geometric forms

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Abstract: In this study we obtained some multiple series identities involving bounded multiple sequences. Hyper geometric forms of these identities involving Kampe de Feriet double. Hyper geometric function and Srivastava's triple hyper geometric function is also derived. The development presented in this work will stimulate further interest in research in the area of special function.

Keywords: Kampe De Feriet double Hypergeometric Function, Srivastava's Triple, Hypergeometric function.

Towards the End of Plastic Era

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Abstract: Plastic has become an integral part of modern life and plays a vital role in our everyday life. Though, it is very harmful material for the health of all life forms and poses serious environmental issues by being non- biodegradable. Plastic is responsible for water and land pollution and releases carbon dioxide and dioxins on burning, thus, contributes to global warming and air pollution. As of 2018, about 380 million tons of plastic was produced worldwide annually but only 9% has been recycled and another 12% has been incinerated. Awareness of the plastic problem has awakened new interest in the area of degradable polymers and utilization of microorganisms which helps in the biodegradation of plastics and polyethylene. Microbial enzymes are helpful in the biodegradation of plastic especially fungal ones. Various types of plastics, Polypropylene, Terephthalate, High Density Polyethylene, Polyvinyl chloride, Low Density Polyethylene, Polystyrene, Polycarbonate etc., are proven to be degraded by various microbial agents. Also, many biodegradable polymers are designed to degrade the organic and inorganic materials, starch, lignin etc., for example poly-hydroxyalkanoates (PHA) is a great biodegradable, biocompatible, thermoplastic synthesized by microorganism. This review paper outlines the current research & development on plastic biodegradation and bioplastic synthesis and attracts the attention towards the synthetic eco-friendly polymer technology.

Keywords: Plastic, material, environment, microbial.

ICARI-AS-20-01-08

Analysis of CCD and CMOS Sensor Based Images from Technical and Photographic Aspects.

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Abstract: In Image capturing devices, Image sensors play a very vital role. Image sensor is responsible for capturing light from outside world and converts it into electronics signal to develop a digital Image. There are two majorly used Image sensors CCD and CMOS. Both have their own merits and demerits. When it comes to study the features of these sensors, there is always confusion whether one person goes for technical aspects or image quality delivered by cameras based on these sensors. This paper will evaluate the both technical and photographic aspects. Firstly, distinct images are captured by CCD and CMOS sensor based cameras by varying different parameters like ISO, exposure value, shutter speed etc. Secondly, to test the technological aspects Mean Square Error (MSE), Pixel to Signal Noise Ratio (PSNR) and SSIM are evaluated for different cases. The conclusion has been complied within the finish of this paper.

Keywords: ISO, MSE, Exposure Value, PSNR, Shutter Speed, SSIM, CCD and CMOS.

ICARI-AS-20-01-09

Effect of demographic factors in investment decisions of individual investors – A case study in Delhi-NCR

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Abstract: This paper identifies the risk perception of individual investors in Delhi NCR. Investment decision plays a significant role in one's life and it is affected by various factors, risk perception being one of the most important factor. It is a complex process. As far as risk is concerned, human behaviour has changed drastically over the time and an effort has been made to explore its effect on investment decision. An interview and well-structured questionnaire will be distributed among 352 investors.

Keywords: Demographic factor, investment, risk, human.

ICARI-CE-20-01-01

Particle Size Analysis of Different Clay Types

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Abstract: Clay is a distinctive earth material which is able to find from various locations on the earth while having a series of diverse applications because of the unique physical and chemical properties of clays foremost of the high porosity and less permeability although the properties may be varied with the origin and formation. The analysis of the particle size distribution is an essential aspect before most

of applications especially for the filtering purposes and such kind of objectives were the foundation for current study. There were collected anthill clay, brick clay and roof tile clay samples from different regions in Sri Lanka. The separated portions of each sample were oven dried for approximately 24 hours under the temperature of 110°C until the mass was becoming constant. Some representative samples from each dried clay sample were separated for moisture content investigation, wet sieve analysis and dry sieve analysis. The dried clay samples were manually crushed before putting into the sieve set. As the results for the moisture contents there were obtained 15.49% for anthill clay, 21.45% for brick clay and 25.97% for roof tile clay. According to the wet sieve analysis there were obtained the finer percentage (<0.075mm) as 59.9%, 37.36% and 72.38% in order to anthill clay, brick clay and roof tile clay while distributing the portions of coarse particles of each clay type in the size range between 0.075mm-2mm that mostly composed sand particles. In the dry sieve analysis there were mainly observed some balanced distributions of particle sizes of clays in the size range between 0.037mm-2mm while having the finer portions (<0.037mm) of clay particles as 2.20%, 1.42% and 1.47% accordingly roof tile clay, brick clay and anthill clay. As the results for the overall investigation the relatively higher finer clay portion was found from roof tile clay.

Key words: Anthill clay, brick clay, roof tile clay, coarse particles, finer particles

ICARI-CE-20-01-02

Buoyancy Effects on the Pseudoplastic Fluid Flow Structure and Heat Transfer from an Infinite Square Bar

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Abstract: Owing to the overwhelming applications of non-Newtonian fluids in process and related industries, the present study attempts to address the effects of aiding buoyancy and Reynolds number for non-Newtonian shear-thinning fluids around the cylinder of square cross-section under the impact of wall confinement. The momentum and heat transfer characteristics of the laminar flow of shear-thinning fluids in a vertical channel with a built-in square cylinder under the influence of aiding buoyancy are investigated. The numerical calculations are carried out for the steady flow regime where the ranges of conditions are: power-law index, $n = 0.6$ and 1 ; Richardson number, $Ri = 0-1$; blockage ratio, $BR = 25\%$; and Prandtl number, $Pr = 50$. Streamline and isotherm contours are presented to understand flow and thermal patterns of shear-thinning (or pseudo-plastic) and Newtonian fluids. The various engineering parameters like individual and overall drag coefficients, local and average Nusselt number are calculated. It is found that the drag coefficient and the Nusselt number increase with the aiding buoyancy, while the shear-thinning behavior reduces the drag coefficient and increases the heat transfer rate for the above range of settings. The maximum augmentation in heat transfer is found to be about 23% with respect to the corresponding Newtonian values.

Key words: Square cylinder; power-law fluids; aiding buoyancy; drag; Nusselt number.

Use of Karanja Oil for recovery of energy values from coal washer tailings

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Abstract: The increment in generation of large quantity of fines while mining and beneficiation has led to the serious environmental issues. In this present study, non-edible oil such as Karanja oil was used as bridging liquid to recover coal fines from washery tailings sample, which were discarded while beneficiation process. The coal washery tailings sample was collected from Dhanbad, Jharkhand, with high ash content of 52.74%. The effects of pulp density, oil dosage, and agglomeration time were investigated. From the experimentation, it was found that ash rejection was in the range of 60.90% to 74.96% and organic matter recovery was in the range of 61.14% to 84.77%.

Keywords: Karanja oil, coal washery tailings, high ash content, ash rejection, organic matter recovery.

Traffic light control using open computer vision

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Abstract: Traffic light control systems is basically for the control the flow of vehicles on the junction between the roads. The main motive behind the traffic lights is the smooth motion of vehicles on roads. We all know that the number of vehicles on roads are increasing rapidly and the management of traffic has become really difficult. But to control the flow of vehicles. This project can be implemented using Open CV managing the flow of vehicles. The traffic lights will contain a camera on the polls facing towards the roads which will take images of the vehicles on the road. The images will be processed in the microcontroller using Open CV and the traffic lights will change color accordingly. The road lane having less traffic will receive green first for the duration according to number of vehicles and will follow round robin algorithm.

Keywords:- Traffic light, Open computer vision, round robin algorithm.

Implementation of efficient data storage generated by Common Corporate Social Responsibility

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Abstract: Most of the organizations have their own Common Social Responsibility (CSR) System and perform social events separately. This Common CSR System is used to enable collaboration among many companies and individuals, who want to take part in the social welfare of society. Due to a lack of resources and budgets, it limits their ability to perform these activities on a large scale and in remote areas. To develop a system which will enable different corporate or institutions to come together collectively provides valuable service to society.

The proposed system is overcoming the drawbacks of other available CSR systems by providing the COMMON CSR System for CSR activities with efficient storage management in place of manual record maintenance. Currently, there is no available dataset of various CSR activities, therefore the record of these activities is a big concern and this system provides the record maintenance of data in an efficient way.

One of the incident of Attack on World Trade Center, New York (2001) emphasizes us to think about data losses and recovery. Data loss is a major inconvenience that disrupts the many functions of corporate activities entertained. This system brings the main focus on efficient storage management by using Excel Sheet because it is convenient to recover data and if required, it is easy to convert it in any other format. This System automatically deletes the data after any specified time period and transfer it in an excel sheet. The storage in the excel sheet can be used for data analysis and other related activities to extract valuable information. This Common CSR system also provides a user-friendly environment for better interaction and assistance to the new user through Chatbot.

Keywords: Common CSR, Storage Management, Excel Sheet, Data Set, AI Chatbot.

ICARI-CS-20-01-03

Market Analysis and Separation of Waste into bio-degradable and non-biodegradable Using Convolutional Neural Networks

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Abstract: In recent years, the world is in a state of constant up-gradation, but the problem that we haven't been able to deal with is our impending advancement to a hygienic, clean and healthy society, is garbage and waste. Mostly in our daily life we encounter dustbins that are excessively full and garbage spilling out of them. This kind of situation is neither good for our environment nor for our advancement. It has been observed that people living in a society prefer not to buy most of the things from their local market, instead they prefer going elsewhere. Due to this scenario, the local market face losses. This fact helps us to carry out a study based on waste material from the society and helping local market to support their requirements using Convolutional Neural Network (CNN) and Data analysis. Furthermore, autonomous separation of waste into biodegradable and non-biodegradable has been carried out.

Keywords: hygienic, market analysis, CNN, autonomous, waste separation.

ICARI-CS-20-01-04

Three Phase Smart Tube well Control System

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Abstract: The Idea is about making a Smart Tube well Operating system which can control ON/OFF state of Tube Well as well as keep an eye on the amount of Electricity receiving continuously as well as to check whether the three electricity phase are available to run the 3 phase pump motor. This idea is proposed, seeing the problem of villagers who wait for electricity at night for irrigation and operate it at night time after their exhausting day in fields .We are going to build a single integrated system that will operate it automatically by setting the timer or manually by the farmer by switching it ON/OFF

from his phone, when water is needed and when to switch off the tube well. These systems can be easily installed in Tube well stations to increase work efficiency of farmers and to avoid over irrigation. All the data of operation of tube well will be stored on cloud and farmer will get all the notifications of operations in his cell phone.

Keywords: 3 phase pump, control system, cloud.

ICARI-CS-20-01-05

More than a platform: A place for thinker

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Abstract:-In the present era of technology where in every second a new technology rises and new changes takes place rapidly where everyone have different ways to solve the problem in an optimal way. With this growth in technology people are pondering in different direction for the solution of already existing problems.

There is no existing platform to put our notions and get resources to implement the idea. The common people of the society all have the access to that platform where they put the notions or solutions of the problems which they bear in daily life in an innovative way. Also the major factor which hinders in the growth of the ideas is resources as not all people in the society have full access to the resources to deploy their ideas in reality. The proposed system aim is to provide the web application which gathers the innovative ideas from the users . This application is not only limited to the students but it caters all those users who have their notions which are unique and innovative as well. The propose system provides the repository to collect ideas and checks the uniqueness of the content uploaded by the users by implementing a plagiarism checker which helps the official to find the unique ideas. The system also checks the authentication of the user as per the details provided by the users. It also provides the admin panel from which all the crucial details looked up by the admin.

Keywords: innovative, uniqueness, authentication, plagiarism

ICARI-CS-20-01-06

Java based suggestion model for organizing social events under Corporate Social Responsibility

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Abstract: Currently most of the organizations have their own CSR activities and perform social their events separately. Due to lack of resources and limited budget, their ability to perform these activities on larger scale or in remote areas remains restricted.

Also, other corporate may not be aware of such events, so that they can actively participate as well. So the idea is to develop an organized Common Corporate Social Responsibility Portal where different corporate or individuals can come together and collectively provide valuable service to society.

This could be understood by comparing between the current scenario of how the CSR activities are conducted and how this portal could change this to a better and organized management of CSR activities. Currently most of the organizations have their own CSR portal and conduct social activities on a small scale. Therefore, one corporate may not know what valuable initiative others are driving.

To develop an Organized and Common CSR Portal.

Therefore, this model is designed to provide suggestions to the corporate to conduct the events by collaboration and working hand in hand with each other. Once the companies post their event on the portal, our internal algorithm will work on some parameters on the basis of which it will send suggestions to the companies via e-mail to conduct the events together in order to make it much more successful and enable the event to make a positive impact on the society.

If all of these match for any of the corporate, an automated suggestion e-mail would be sent to both the corporate for collaborating together (The final decision of accepting or rejecting the suggestion depends on the choice of corporates itself

Keywords: Common Corporate Social Responsibility Portal, Automated E-mail Suggestion, Parameters of suggesting, Organized Management.

ICARI-CV-20-01-01

Utilization of plastic in construction

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Abstract: Numerous waste materials are generated from manufacturing processes, service industries and municipal solid wastes. The increasing awareness about the environment has tremendously contributed to the concerns related with disposal of the generated wastes. Solid waste management is one of the major environmental concerns in the world. With the scarcity of space for landfilling and due to its ever increasing cost, waste utilization has become an attractive alternative to disposal. Each of these waste products has provided a specific effect on the properties of fresh and hardened concrete. The use of waste products in concrete not only makes it economical, but also helps in reducing disposal problems. Reuse of bulky wastes is considered the best environmental alternative for solving the problem of disposal. One such waste is plastic, which could be used in various applications. However, efforts have also been made to explore its use in concrete. The development of new construction materials using recycled plastics is important to both the construction and the plastic recycling industries. In this research waste plastic bottles are used in concrete and bricks to curb the environmental problems and later tests are performed to determine its properties.

Keywords: PET bottles, concrete, compressive strength, tensile strength

ICARI-CV-20-01-02

Effect of Silica Fume and Fly Ash as Partial Replacement of Cement on Strength of Concrete

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Abstract: Concrete is the most versatile construction material because it can be designed to withstand most stringent environments while taking on the most inspirational forms. It is one of the most frequently used building materials. Nowadays, most concrete mixture contains auxiliary cementitious material which forms part of the cementitious constituent. In this era, as the growth of world economy increased, the demand of concrete made buildings are also increased. So for this the demand of cement is also increased. Unfortunately, production of cement involves emission of large amounts of carbon-dioxide gas into the atmosphere which is very harmful for the environment. Cement manufacturing

industries emits 5% of global carbon di-oxide which in turns leads to the main causes for the global warming. To decrease the effects we can change the cement with industrial by- product like silica fume, fly-ash and so on. Basically the Fly Ash and Silica Fumes are industrial by-products. The consumption of these industrial by products is becoming popular throughout the world because of the minimization of their potential perilous effects on environment. This paper investigates the individual effects of Silica Fume and Fly Ash as a partial replacement of Ordinary Portland Cement (OPC) on compressive strength, flexural tensile strength and split tensile strength of Concrete.

Keywords: silica fume, fly ash, cementations material, compressive strength, flexural strength, tensile strength.

ICARI-EC-20-01-01

Comparative Harmonic analysis of various PWM techniques for Diode Clamped multi-level inverter in MATLAB/Simulink

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Abstract: Advances in solid state power electronic devices and microprocessors has led to the development of various pulse-width-modulation (PWM) techniques for industrial applications. For example, PWM based 3-phase voltage source inverters (VSI) convert Solar cell DC power to AC power with variable voltage magnitude and variable frequency.

To analyze the applications and advantages of three different PWM techniques over one another, inverter with different techniques have been modelled in the MATLAB/ Simulink environment. The Techniques compared in the paper are: the sinusoidal PWM (SPWM) technique, the third-harmonic-injection PWM (THIPWM) technique, and the bus-clamped PWM (BCPWM) technique. These three methods are compared by discussing their ease of implementation and by analyzing the output harmonic spectrum of various output voltages (poles voltages, line-to-neutral voltages, and line-to-line voltages) and their total harmonic distortion (THD).

Keywords: Multi-level Inverter, PWM, sinusoidal PWM, Bus Clamped PWM, THIPWM.

ICARI-EC-20-01-02

A miniature dual-mode micro strip band pass filter on 5GHZ

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Abstract:- A miniature dual-mode microstrip bandpass filter at the frequency of 5ghz is proposed using a half wavelength stepped-impedance resonator(SIR) with the symmetrical structure.The dual-mode resonator is a square open loop resonator eith an open circuited step impedance and a grounding via located at the symmetrical plane of the resonator.The equation for approximating the resonator frequencies of the resonator are obtained from odd and even mode analysis. To design the filter, first the theoretical resonant frequencies for the filter are calculated. Then the basic dimension of the resonator are approximated using the equation.The filter layout are fine-tunned by simulation and

verified by experiment to conclude the paper. The simulated and measured results are in good agreement.

Keywords: Miniature, bandpass, dual mode, filter.

ICARI-EC-20-01-03

An Innovative approach for establishing an IOT based Smart Classroom

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Abstract: Numerous smart classroom system has been proposed in recent years. However, these systems are more focused on the advancement of the classrooms and forgot to solve some basic and real-time problems. This paper proposes a novel solution to manage the electrical and electronics appliances in a classroom. The foundation of this paper is based on the real-time survey collected from students and faculty. It has been observed that most of the people want to work the system automatically rather than controlling it by some app. Also, many appliances are remain switched on even students left the class room. This paper addresses one of these issues and proposes a simple innovation to the exiting methods of IoT automation. The conclusion and future scope have complied with the finish of this paper.

Keywords: IOT, classroom, electronics, automation.

ICARI-EN-20-01-01

Assessment of water quality of Najafgarh drain and its impact on river Yamuna

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Abstract: Water is one of the basic amenities of life and Yamuna is a major source of water supply for Delhi and nearby states of Haryana, Uttar Pradesh, and Rajasthan etc. Due to the rapid growth of industries and advanced agricultural activities in and around national capital territory Delhi, the deterioration of Yamuna River has become a major concern. The objective of this study is to assess the Water Quality of Najafgarh drain and unveil the present deteriorated condition of Yamuna River in Delhi. A comparison has been made between the water quality of river Yamuna before and after the confluence of Najafgarh Drain into it. The present situation and contamination level of River has been analysed due to various drains present in the Delhi stretch. The effect of pollution load and waste water added to Yamuna in Delhi is studied by comparing the water quality in river Yamuna at palla (before entering in Delhi) and at Okhla barrage (the downstream point from where the river Yamuna meets Agra canal and leaves Delhi.). For the study, water samples were collected from six different locations in river and Najafgarh Drain. Experimental results indicated that the water quality of river was comparable with the Drain as most of the parameters were exceeding the prescribed standards for surface water. Overall the study concluded that Yamuna river has been converted into a Drain in Delhi stretch and its water is not suitable for any other purposes without proper and highly efficient treatment system.

Keywords: Yamuna, Najafgarh Drain, Contamination, Delhi, Pollution.

Treatment and disposal of pharmaceutical waste

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Abstract: Pharmaceutical waste is the emerging chemical waste in the environment. In recent years, concerns about the occurrence and fate of active pharmaceutical ingredients, solvents, intermediates and raw materials that could be present in water and wastewater including pharmaceutical industry wastewater has gained increasing attention. They include expired, unused, spilt, contaminated pharmaceutical products, drugs, vaccines, and sera that are no longer required. They are considered to be biologically active compounds. These waste needs to be carefully treated and then safely disposed off. But the treatment of these types of waste is difficult because of their changing nature. This paper reviews the work done in areas of treatment and disposal of the pharmaceutical waste. The different processes studied include conventional treatment process such as activated sludge process on one hand and on the other hand it include new technologies such as bio-augmentation, activated carbon, advanced oxidation process in conjunction with convention treatment methods. It also studies the various disposal techniques such as incineration, landfill, discharging into the sewers.

Keywords- Pharmaceutical waste, Antibiotics, Waste disposal, effective treatment and wastewater

Design of waste water treatment plant using C-Tech Technology

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Abstract: The New Delhi Railway Station (NDLS), situated between Ajmer Gate and Paharganj is the main and one of the busiest and largest railway stations in India. The New Delhi railway station holds the record for the largest route interlocking system in the world along with the Kanpur Central Railway Station and handles over 350 trains and 5, 00,000 passengers daily over its 16 platforms. Trains for all over India originate at New Delhi Railway Station.

Currently there is no means of treatment of waste water in NDLS. All this untreated wastewater is being dumped directly into the Yamuna which is further adding to the pollution to the almost biologically dead river. Also the potential of reusing and recycling of wastewater can drastically reduce waste water consumption.

So our work is to design a low cost wastewater treatment plant for NDLS using SBR Technology to reduce pollution in Yamuna and also tap into potential of wastewater reusing and recycling. So the total cost of this Sewage treatment plant is came out to be Rs11693994.

Keywords: New Delhi Railway Station, Sewage Treatment Plant, Waste water.

Study on Adequacy of Functional Characteristics of a Typical Urban Waste Water Treatment Plant

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Abstract: This study examines the presence of pollution of river Yamuna in the city of Delhi. The condition of river Yamuna is deteriorating day by day. The main cause of this is the poor standard treated sewage from the sewage treatment plants being dumped into drains which directly meet into

river Yamuna. In this study I audited Keshopur 40 MGD sewage treatment plant which works on activated sludge process in which Mixed Liquor Suspended Solids (MLSS) is the prime concern for the proper functioning of plant and checked the adequacy of the various functional units by comparing the detention time of each and every unit with the standard detention time given by code. Activated Sludge Process involves aeration and a biological floc composed of bacteria and protozoa to convert non-settle particles into the settle. ASP provides one of the highest degree of treatment within the limited cost involved. In this study various recommendations are also given for increasing the efficiency of sewage treatment plant.

Keywords: Activated Sludge Process, Sewage Treatment Plant, MLSS, Adequacy.

ICARI-EN-20-01-05

Study of Trapping and Intermixing of Delhi Drains for Rejuvenation of River Yamuna

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Abstract: This study examines the presence of pollution of Yamuna in the city of Delhi, from two perspectives: (i) understanding the concept of trapping drains and (ii) establishing small scale Sewage Treatment plants at the point of outfall. With events occurring over the last century making river Yamuna polluted, the study focuses on the latest methods and technologies available to avoid intermixing of sewage and storm water drains to reduce pollution. Due to mixing of storm water and sewage, the desired qualities of the river water get degraded and the amount of dissolved oxygen decrease considerably. If this water is allowed to pass through a sewage treatment plant then it will lead to increase in time of treatment due to increase in discharge. The study also includes the theory of tributaries of river Yamuna, Major Drainage problems in the region, Quality of River water.

Keywords: Dissolved Oxygen, Intermixing of Sewage, Sewage Treatment Plant

ICARI-PH-20-01-01

To study the Phototoxic Potential of Ofloxacin by using cell line (HaCaT) as an alternate model

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Abstract: Phototoxicity assessment of the ofloxacin was studied by HaCaT cell line. Singlet oxygen determination (1O_2), Superoxide anion radical ($O_2^{\cdot-}$) and 2-deoxyguanosine generation were studied under the exposure of UV-A, UV-B and natural sunlight. The drug was studied under the ambient intensities of UV-A (1.5 and 2.2 mW/cm²), UV-B (0.6 and 0.9 mW/cm²) and sunlight (60 min.). The drug was generating 1O_2 and $O_2^{\cdot-}$ in a concentration and irradiation dose dependent manner. 2'-deoxyguanosine (2'-dGuO) showed that 1O_2 , $O_2^{\cdot-}$ were mainly responsible for ofloxacin-sensitized photo-degradation of guanine base. The generation of 1O_2 , $O_2^{\cdot-}$ and 2'-dGuO assay was confirmed by using their specific quenchers. Drug had also showed significant reduction in cell viabilities of HaCaT cell lines under UV-A, UV-B and sunlight exposure as measured by MTT (colorimetric assay for measuring cell metabolic activity) and

NRU assays. The MTT and NRU assays are high quality and suitable for photo toxicity assessment by high throughput system to identify cytotoxicity of compounds regardless of the underlying mechanism and chemical class and is an effective tool to rank compounds based on their potential intrinsic cytotoxicity. Further, UV-induced photo-peroxidation of linoleic acid accorded the involvement of ROS in the manifestation of drug photo-toxicity. The *in-vivo* skin-sensitization reactions of drugs have been investigated in presence of selected free radical scavengers using guinea pig. The results confirm that Sodium azide (NaN_3) and 1,4 diazabicyclo [2.2.2] octane (DABCO), inhibited considerably the skin sensitization *in-vivo*. These observations suggest that the O_2 dependent photodynamic action of drugs contribute significant development of cutaneous photo-toxicity, which can be inhibited by ROS scavengers. The *in-vivo* skin-photosensitization of psoralen was studied (a photochemotherapeutic drug well known for its skin-photosensitization reactions) in the presence of selective free radical scavengers. Topical application of NaN_3 (50 and 100 g/cm^2) led to almost complete inhibition of erythema and oedema on the dorsal skin of guinea pig. DABCO (50 and 100 g/cm^2), was almost equally as effective *in-vivo* quencher of skin photosensitization was NaN_3 .

Keywords: Phototoxic, Ofloxacin, cell line.

ICARI-ME-20-01-01

An approach to the Influence of Fluid Viscosity and the Cutting Parameters in Turning a Carbon Steel Using Surface Methodology

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Abstract: This experimental study focuses on the effect of viscosity on the surface condition of machined part during turning. The tests are carried out on C45 steel, using metal carbide cutting tools. The objective is to optimize the cutting parameters as well as the analysis of the surface roughness (R_a), using the surface response method, which allows to present the mathematical models of the roughness. The effect of the interactions on the roughness criterion was studied using a statistical analysis based on analysis of variance (ANOVA). The results recorded show that the cutting speed has the most significant effect on the surface condition. This optimization deduces that the best surface roughness of the non-alloy steel parts C45 is obtained when the cutting speed is 286 m / min, the feed rate is 0,15 mm / rev, the viscosity is 22,5 Pas and the depth of cut is 1,1 mm.

Keywords: Turning, viscosity, roughness, cutting conditions, ANOVA, Optimization

ICARI-ME-20-01-02

Effect of diesel and castor oil biodiesel on a diesel engine

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Abstract: World is absolutely dependable on petroleum products from decades for getting everyday vitality needs. Manageable properties and eco-obliging nature of biodiesel has made it most surely understood among various different choices to oil based commodities. Scientists and specialists have reached the resolution that biodiesel can be a proper substitute for this

circumstance. In the present examination blends of diesel and castor oil biodiesel were contemplated for considering their consequences for execution and outflow attributes. Blends of diesel-biodiesel were set up as D90/B10 and D80/B20. Then these blends were tested in a single cylinder, small utility diesel engine. It was concluded from the experimentation that blends of diesel and castor oil biodiesel results in increasing the BSFC and BSEC, and decreasing BTE of the engine. CO, HC and smoke discharges were observed to be diminished for fuel mixes having diesel and biodiesel, while NO_x outflows enhanced as compared to diesel.

Keywords: Castor oil biodiesel, performance, emissions, diesel engine.

ICARI-ME-20-01-03

Enhancements in Mechanical Properties of Dissimilar Materials using Friction Stir Welding (FSW) Technology: A Review

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Abstract: The various light weighted material which reduces the overall weight of a component, increases the mechanical properties like tensile strength, hardness, fatigue strength etc. plays a important role in the emerging world of technology. New developments in friction stir welding contributes to the major acceptance in the research field. Among the various metals, the research is focussed on the aluminium metal matrix composite which replaces the conventional welding of iron and steel. Moreover, the joining of dissimilar metals aluminium and other alloys is a need of the physical world. This paper contributes the review towards the recent research in friction stir welding of dissimilar welding for enhancing the mechanical properties of materials.

Key Words: Mechanical Properties Enhancement, FSW, Green Technology, Dissimilar metals

ICARI-ME-20-01-04

Diesel Engine Performance with Karanja Biodiesel Oil by Using TOPSIS Method

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Abstract: Increasing the demand for energy dramatically because due to rapidly increasing the development of industries, expanding the urbanization, the economic growth and rising of the population in the world. To fulfill the demand of energy, a large amount of alternative source is widely used from different fossil fuel in internal combustion (IC) engine sector. In IC engine fuel technology, alternative fuel blend assessment is imperative to consider the choice including the choices of adjusting inside various criteria and feelings from various chief of IC engine specialists. This paper depicts the use of Multi-Criteria Decision Making (MCDM) strategies for the determination of an ideal blend of Karanja oil methyl ester with diesel in the compression engine (CI) engine. So as to scan for the ideal procedure, by an application of TOPSIS (technique for order performance by similarity to ideal solution) techniques had been

applied for solving multiple responses of the optimization problem. A productive examination of the procedure and positioning of choices can be accomplished for enhancement blends choice through TOPSIS techniques. It was seen that a mix B75 was the most appropriate use in CI engine without fundamentally by influencing the emission and performance.

Keywords: IC engine, TOPSIS, Biodiesel, Energy

ICARI-ME-20-01-05

Scheduling a Job Shop FMS by a Hybrid Metaheuristic Approach

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Abstract: Flexible Job shop scheduling (FJSS) is an extension of classic job shop problem. Though decades have passed on researching this area, the FJSS still have a scope to perform further research due to its high complexity. It's a classic NP hard problem. Recently many researchers are successful in using evolutionary algorithms to optimise the FJSS. This paper takes it a notch further by proposing a new technique by hybridising three evolutionary algorithms of Genetic Algorithm, Particle Swarm Approach, Tabu Search named *GAPSATS*. The proposed technique has been used to minimise three objectives namely; make span, maximal machine workload, and total workload of the machines. Software is developed for getting optimal scheduling for the problem taken from literature. The results have been compared with data taken from literature. The results were found effective and better and faster optimal results were obtained.

Keywords: Flexible manufacturing system, Scheduling Optimization, Genetic algorithm, Particle Swarm Approach, Tabu Search, meta heuristic techniques

ICARI-ME-20-01-06

Thermal Performance Optimization of Single Stage, Multi Stages (Two ,Three & four Stages) Cascade Vapour Compression Refrigeration Systems using New (Low GWP & Zero ODP) Eco-Friendly Refrigerants for Reducing Global Warming and Ozone Depletion

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Abstract: The eco-friendly refrigeration technologies using new HFO refrigerants are receiving more and more attention in the days by day of for solving energy and environmental problems. In this paper, it is proposed to use natural refrigerants such as ammonia, carbon dioxide, new HFO refrigerants and hydro carbons in multi stage cascade vapor compression refrigeration systems for replacement of presently maximum used high global warming potential R-134a refrigerant for sustainable environment. In this paper, thermal models have been developed for two/ three/four stages cascade refrigeration systems using HFO-1234yf & R1233zd (E) in the high temperature cycles for the range of 50°C to -30°C and HFO-1234yf & R1233zd (E) for medium temperature applications for the range of 0°C to -50°C. Numerical computation was

carried out by using R1234ze (E) & R1233zd (E) in the temperature range of 50°C to -30°C in the high temperature circuit and R1234yf & R1233zd (E) in the range of -20°C to -50°C for medium temperature range. The developed model can also predicts the thermal performances of using nine eco-friendly refrigerants in low temperature circuit and R1233zd (E) in medium temperature cycle. The ecofriendly refrigerants HFO-1233zd (E) & R-1234ze (E) and HFO-1234yf can replace R134a without minor modifications. However up to temperature -50°C in the low temperature evaporator circuit with two types of temperature over-lapping (Approach=10°C) and condenser temperature of 50 °C with cascade evaporator of 0°C , the combination of R1234ze(E) in high temperature circuit and R1234yf and R1233zd(E) in medium temperature circuit gives best results for replacing R134a and for -95°C of low temperature evaporator circuit and 50°C of high temperature condenser and -30°C cascade evaporator with temperature overlapping (Approach=10°C) the combination of R1234ze(E) and R245fa gives better thermodynamic performances as compared to R-1234yf and R245fa in two stages cascade refrigeration systems can replace R134a. Similarly cascade systems using HFO-1234ze(E) in high temperature circuit and R1233zd(E) in medium temperature cycle and R245fa intermediate temperature circuit gives better thermodynamic performances than using HFO-1234ze(E) in high temperature circuit and HFO-1234yf in intermediate temperature circuit and R32 which can replace high GWP R134a refrigerant in three stages cascade systems for ultra-low temperature applications.

Keywords: Two/three stage cascade refrigeration system, Global warming and Ozone depletion, HFO refrigerants.

ICARI-ME-20-01-07

Effect of chemistry of weld metal in submerged arc welding

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Abstract: The submerged arc welding process is the most widely used arc welding process for joining thick plates and pipes. The features that distinguishing submerged arc welding from other arc welding process is gradually fusible material termed as flux. The flux used in submerged arc welding contributes a major part (above 50%) towards the total welding cost. The properties of weld metal have been found to be dependent upon flux-electrode-base metal-composition on welding parameters. Flux and filler metal play a central role in ascertaining the property of weld metal. In the present work, the effect of operating arc voltage, welding current, welding speed and nozzle distance on flux consumption and chemical composition of carbon and silicon has been studied. A Mathematical model was developed from data generated using two level-half factorial technique. The experiment is conducted as per the design matrix. Design Expert software 7 is used in order to (i) the designing of a set of experiments for adequate and reliable measurement of the true mean response of interest (ii) the determining of mathematical model with best fits (iii) finding the optimum set of experimental factors that produces maximum or minimum value of response and (iv) representing the direct effects of procedure variables on the flux utilization, current and silicon through two dimensional graphs. It was observed that the flux utilization decrease with an increase in wire feed rate and its welding speed. The flux utilization an increase with an increase in arc voltage. The effect of constant tip to work distance has in significant effect on flux utilization. Carbon percentage an increase with an increase in arc voltage and welding speed. Carbon percentage reduce with raise in welding current. Silicon percentage decrease as an increase in current and voltage.

Keywords: Submerged arc welding machine, Design expert.

ICARI-ME-20-01-08

Research methodology: Prioritization of new smartphones using TOPSIS and MOORA

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Abstract: In today's world purchasing a smart phone has become complicated task for the customers due to range of specifications like Battery, Camera, Screen Size, Cost, Performance, etc. To counter this problem we have number of techniques available with us like the multi-criteria decision-making (MCDM), fuzzy logic, etc. We have used TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) and MOORA (Multi-Objective Optimization on the basis of Ratio Analysis). The objective of this study methodology is to obtain an effective and efficient multi criteria decision making (MCDM) approach to evaluate different smart phone alternatives according to consumer preferences and to find out the best optimal smart phone. Main 12 attributes were identified through many literature reviews and discussion with experts from the Indian smart phone industry and consumers. Integrated TOPSIS-MOORA approach is proposed for prioritizing alternatives based on different selected attributes. Five smart phone brands have been selected for evaluation for this methodology. Battery, Camera, Screen Size, Cost and Performance are the top five prioritized factor taken in this study according to consumers point of views. The results obtained by used methodology will be beneficial for the consumers to differentiate between different smart phones of current industries.

Keywords: Integrated TOPSIS and MOORA; AHP; MCDM; Smart Phones selections criteria; Prioritization; Normalized decision matrix

ICARI-ME-20-01-09

Effect on NO_x with Different Port Angle in a CI Engine

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Abstract: Compression Ignition engines are popular in many industries and are mostly used in automobile sector for transmitting power to the wheels, used in generator sets from producing electricity and are also used in the constructing machinery to mix the construction materials. Diesel engine are also used in telecommunication infrastructure and mining facilities. Generally there are 4-strokes in an internal combustion engine. Intake, compression, expansion and exhaust strokes are the four strokes. Out of the 4-strokes, intake and compression stroke are the important stroke. Which generally defines the air flow pattern inside the combustion chamber. Which then render the fuel injection condition during compression stroke. However there are some problems such as decreased efficiency and enhanced emission are because of improper diffusion. Air fuel mixture mainly defines the performance of combustion and the emission characteristics of the engine. A lot of research are being carried out on the basic flow dynamics in the cylinder, which could improve the efficiency of the engine and reduce the emissions. This paper shows the simulation analysis of different port angle and its effect was on the formation of NO_x. Swirl and mass flow rate are also compared in this paper.

Keywords: IC Engine, Port flow simulation, swirl, NO_x, valve

ICARI-ME-20-01-10

Challenges and Solutions for Aluminum Welding

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Abstract: Aluminum and its alloy is most common materials for parts of automobile and aeronautics engineering. Welding of aluminum is a challenging task for practitioners and researchers. Welding of aluminum is not possible without filler materials. A special mechanism is necessary for filler material during welding of aluminum. Due to high thermal conductivity of aluminum, full penetration of weld is not possible. Generally, aluminum combined with oxygen and formed oxides which has high melting temperature than base metal. Therefore, oxides of aluminum should be removed by performing brushing or chemical performing. In nut shell, pre as well as post welding processes is necessary for welding of aluminum. In this way a good information about the practices of aluminum

welding has been concluded in this manuscript. Comparative study of different techniques of aluminum welding is also discussed in this manuscript.

Key words: Welding, aluminum, alloy, manufacturing processes

ICARI-ME-20-01-11

Numerical Analysis and Surface Modelling of Air Plane Wings

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Abstract: The main objective of this study is to enhance the aerodynamic characteristics and maneuverability of the aircraft. The focus is to increase the lift and reduce the pressure drag by delaying the boundary layer separation on NACA 2412 airfoil by applying inward cavities known as dimples. This also increases the stall angle and improves the aerodynamic efficiency. A comparative study is presented between the plain airfoil and the airfoil with dimples. Different parameters of the dimples such as dimple aspect ratio, distance between two dimples and position of dimple with respect to chord length are considered and their effect on lift and drag coefficients are presented. The airfoil models are generated in Solidworks and analysis is done by help of ANSYS Fluent software. This analysis favours the dimple effect by showing decrease in drag and increase in lift thereby providing better fuel economy and performance of the aircraft.

Keywords: Ansys, Fluent, NACA 2412, Airfoil, Dimple

ICARI-ME-20-01-12

Heat Transfer Characteristics of Microjet Impingements with Flow Extraction

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Abstract: The present study proposes a novel microjet impingement-electronics cooling. The model is realized on a silicon substrate with the arrangement of impinging and extraction holes. A conjugate heat transfer analysis is carried out which includes heat transfer from the substrate base to the impinging fluid which subsequently taken away through the extraction holes. The impingement microjet is surrounded by six micro holes distributed hexagonally to extract the spent flow. A three dimensional (3-D) numerical analysis is performed for a single-phase steady state laminar flow in view of the small flow rates and micro scales. The proposed model is investigated for local temperature

and heat transfer coefficient distribution. The highest temperature is observed near the impingement, and the lowest temperature is observed on the surface below the extraction holes. With the increase of jet-to-effusion hole diameter square ratio, the high-temperature region is reduced. However, there is no significant improvement is detected in the local heat transfer coefficient.

Keywords: Microjet, Jet impingement, Effusion holes, Heat transfer coefficient, Electronics cooling.

ICARI-ME-20-01-13

Effect of temperature on wear rate and coefficient of friction of railway brake block

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Abstract: Braking is a very complex process in overall railway assembly, braking system has a great importance and contribution towards the safety. During braking a number of phenomenon occurred like mechanical, thermal, electrical etc. which led to the high forces act on the brake blocks of railway results in thermal cracks, reduced life of blocks. It is estimated that a minimum of 60 brake shoes or brake blocks are used in the railway wagons which have to be changed within a month. In our study, author investigated and analyzed the braking tribology characteristics i.e. to determine the wear rate and coefficient of friction at a constant frequency at different temperature by keeping the stroke length constant. The experiment reveals the rate of wear and coefficient of friction varying at ambient and in summers during to continuous exposure of brake block for a fixed distance moved. The experiment is performed on the liner reciprocating tribometer by using stainless steel pin without any aid of lubricating material.

Keyword: Wear rate, Coefficient of friction, Railway brake block.

ICARI-ME-20-01-14

Fabrication and Characterization of Natural Fibre Reinforced Polymer Composites: A Review

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Abstract: These days' material technologies are assuming significant job for the improvement of items in different fields. Numerous specialists are scanning for basic materials of high quality, less weight and minimal effort. All in all, solid materials are generally thick and light materials have less quality. So as to accomplish high quality and less weight, we go for composite materials. Numerous strategies are received by various specialists to manufacture composite materials. It is likewise important to describe the created composites based on tensile, impact, flexural and hardness test. This reality encourages us to outline the examinations, thus a survey on fabrication and characterization of natural fiber reinforced polymer composites has been done.

Keywords: Composite, material technologies, characterization, minimal effort.

ICARI-ME-20-01-15

Investigation of Compressive Strength of Cement Concrete after Partial Replacement of Fine Aggregate with Fine Waste Tyre Rubber and Cement with Glass Fiber

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Abstract: Cement Concrete is a hardened construction material made by mixing a chemically inert aggregate (usually gravel, sand, or crushed stone), a binder (any type of cement), chemical additives, and water. There is a wide area of research where we can partial use chemically inert material instead of natural aggregate. Present study is based on partial replacement of fine aggregate with waste fine tyre rubber and cement partially replaced by glass fiber. Ordinary Portland cement was used in this work. After grinding, truck scrap tyres were used as a fine aggregate for partial replacement. Cement was replaced by locally available glass fiber. 7 days and 28 days' compressive strength test was performed after replacement of 0-20% fine aggregate with fine rubber and 0-1% cement with glass fiber. After performing experiment, results show that workability of rubberized glass fiber concrete for each selected w/c ratio, decreases with increasing rubber and glass fiber content, so we have to use super plasticizer to maintain the required workability. The compressive strength of rubberized glass fiber concrete is increased when fine aggregate is replaced by 5% of fine rubber and cement is replaced by 0.25% of glass fiber marginally, compressive strength is decreased when replaced with higher percentage. The Ultra Sonic Pulse Velocity of rubberized glass fiber concrete was also checked

Key words: Glass fiber, Compressive Strength, Workability, Super plasticizer, Ultra Sonic Pulse Velocity.

Application of DMAIC Tool of Six Sigma in Small Scale Industry: A case study

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Abstract: Different researches are conducted in studying the manufacturing process in different industries like Food Processing, Rolling mill, Grinding process, Distillation unit etc. The applications of 6 sigma has been successful in achieving increased output and better finished products apart from increasing profit margin, but none of these researches were conducted in Indian textile industry and application of 6 sigma in improving overall productivity is yet to be implemented.

This research is intended to study manufacturing process of Indian textile company Dewan textile located in Meerut and apply 6 sigma tool to improve processes in various departments and also achieve good finished products apart from improving profit margin of company. For any company to have financial gains it is imperative to reduce defect rate and improve yield of product manufactured. Higher defect rates reduce Profit margins therefore companies strive to decrease defect rate of the product during manufacturing to maximum possible extent. This is accomplished by various inspection methods during production cycle and implementing changes as and where necessary. Yarn is manufactured in textile industry by going through number of processes carried out at various departments which raises defect rate to a huge extent. This project studies manufacturing processes involved in various departments of yarn manufacturing process and DMAIC tool of 6 sigma is implemented in winding department to reduce defect rates before finished product goes to customer. Final package is made in winding department from where end product is directly sent to customers and arises possibility of customer complaint.

Keywords: DMAIC, 6 sigma, Textile industry.

Comparison of Deflection of Simple Supported Beam with Analytical and Finite Element Method for Different Loading Conditions

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Abstract: This paper presents the finite element formulation for simple supported beam and obtained deflection and slope and results are compared with the solution obtained with Euler–Bernoulli beam theory. Here deflections and slopes have been obtained with different loading

conditions, such as uniformly varying load and uniformly distributed loadings. The analytical results are different with finite element method solutions for less elements but solution converges when the number of elements are increased. The computer programme in Matlab software has been written to obtain deflection and slope of Euler–Bernoulli beams at different loading conditions.

Keywords: Simple supported beam, Euler–Bernoulli beam, uniformly varying loads, uniformly distributed loads, Matlab, FEM

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Influence of welding parameter on bead geometry of weld metal in submerged arc welding

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Abstract: Submerged arc welding is generally used for fabrication large diameters line pipes, pressure vessels and wind turbines due to its high deposition rates, high-quality welds, ease of automation and low operation skills necessities. Submerged arc welding is characterized by a large number of process parameters influencing the performance of the output such as hardness two level and bead geometry, which subsequently affects the weld quality. In this research work, the effect of different welding parameters on drop geometry has been investigated. Four welding parameters specifically current, arc voltage, welding travel speed and nozzle-to-plate distance are selected. Mathematically model was developed from the data generated using two-level half factoring. The design expert 7 is implemented in order to find out significant and communication effect. It has been observed that width of the bead, penetration, reinforcement is an an increased with an an increase in welding current. The width of bead also an increases with an an increase in voltage but reinforcement and penetration decrease with an an increase in voltage. Nozzle to plate distance and welding speed produces very fewer effect on width of bead, penetration, and reinforcement.

Keywords: Submerged arc welding machine, Design expert 7.

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Effect of welding parameter of flux consumption in submerged arc welding

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Abstract: The submerged arc welding process is most widely used arc welding process for joining thick plates and pipes. The features that distinguishing submerged arc welding from other arc welding process is gradually fusible material termed as flux. The flux used in submerged arc welding contributes a major part (above 50%) towards the total welding cost. The properties of weld metal have been found to be dependent upon flux-electrode-base metal-composition on

welding parameters. Flux and filler metal play a central role in ascertaining property of weld metal. In the present work, the effect of operating arc voltage, welding current, welding speed and nozzle distance on flux consumption and chemical composition of carbon and silicon has been studied. Mathematical model was developed from data generated using two level half factorial technique. The experiment is conducted as per the design matrix. Design Expert software 7 is used in order to (i) the designing of a set of experiments for adequate and reliable measurement of the true mean response of interest (ii) the determining of mathematical model with best fits (iii) finding the optimum set of experimental factors that produces maximum or minimum value of response and (iv) representing the direct effects of procedure variables on the flux utilization, current and silicon through two dimensional graphs. It was observed that the flux consumption decrease with increase in wire feed rate and its welding speed. The flux utilization increase with increase in arc voltage. The effect of constant tip to work distance has in significant effect on flux utilization. Carbon percentage increase with increase in arc voltage and welding speed. Carbon proportion decrease with increase in welding current. Silicon percentage decrease as increase in current and voltage.

Keywords: Submerged arc welding, machine, flux, voltage .

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8-Node Quadrilateral Matlab Code for Finite Element Analysis

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Abstract: The purpose to this work to provide mathematical approach to developed MATLAB code for 8-node quadrilateral element for finite element analysis of 2-D structure to improve accuracy in results. In present investigation 8-node quadrilateral element MATLAB code is proposed for structural analysis of 2-D Isotropic elastic structures. The meshing of cantilever beam is done with 8-node elements which are subjected to static loading condition. In this paper MATLAB code is implemented on cantilever beam and the result obtained is also validated with ANSYS software. Moreover, this code can also be modified for Messerschmitt-Bolkow-Beam and complete MATLAB code is also presented in appendix. The developed MATLAB code can universally adopted for other analysis such as topological optimization, thermal analysis, dynamic loading condition etc.

Keywords: Finite element method; 8-node element, Stiffness matrix, Isotropic element

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Determining the Adoption Index of Electric Vehicles Using Graph Theory Matrix Approach

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Abstract: Electric Vehicles (EVs) have gained immense representation as a mainstream solution to reduce greenhouse gas emissions and extenuate the effect of the automobile industry on climate change. Through policy changes and a focussed shift towards sustainable development, the industry is undergoing an unprecedented transition, with conventional Internal Combustion vehicle sales declining rapidly. While the global EV industry is expanding rapidly, the regional effect is significant, with some markets according near-mainstream status, and others remaining in early-adoption stages. This leaves domestic automakers to come up with forecasts with little relevant data. The main objective of this study is to identify a set of pertinent factors impacting the adoption of EVs at a local level, to determine the adoptability index of such vehicles in India. While current forecasting methods use either qualitative or quantitative factors, this study selects an amalgamation of both, displaying their relative importance. Using the Graph Theory Matrix Approach, a framework has been developed to generate an adoptability index using the selected attributes and sub-attributes. The study is based predominantly on the Indian market, but can be adapted to various regions with a few tweaks, allowing a more localized view than is currently available.

Keywords: Adoptability, Electric Vehicles, Forecasting, Graph Theory

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Study of different nature inspired techniques used in Flexible manufacturing system

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Abstract: The augmented use of flexible manufacturing systems (FMS) to resourcefully provide customers with expanded product line has created a significant set of operational challenges. Although extensive research has been conducted on design and operational problems of automated manufacturing systems, many problems remain unsolved. In particular, the scheduling task, the control problem during the operation, is of prominence owing to the dynamic nature of the FMS such as flexible parts, tools and automated guided vehicle (AGV) routings. The FMS scheduling problem has been tackled by various traditional optimization techniques. While these methods can give an optimal solution to small-scale problems, they are often inefficient when applied to larger-scale problems. In this paper, different scheduling mechanisms are studied to find out optimum scheduling from nature inspired techniques like genetic algorithm (GA), Ant colony Optimization(ACO) algorithm, Memetic algorithm (MA) and particle swarm algorithm (PSA) by considering multiple objectives.

The memetic algorithm presented here is essentially a genetic algorithm with an element of simulated annealing. The different optimization algorithms (memetic algorithm, genetic algorithm, simulated annealing, Ant colony Optimization and particle swarm algorithm) are compared and conclusions are presented.

Keywords Flexible manufacturing system; Genetic algorithm; Memetic algorithm; Particle swarm algorithm; Ant colony Optimization; Scheduling; Simulated annealing

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Improvement in the Engineering properties of clayey soil using Sodium chloride

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Abstract: Major problem faced by civil engineers is when an available site does not have suitable engineering properties to support structures, roads and foundation. The soil of the site may be weak due to number of reasons. A difficult problem in work exists when the soil is found to be clay or the water table in that region is high. Soils with high clay content generally have low shear strength and has tendency to swell when their moisture content is allowed to increase. For these reasons clayey soil is not suited for structures, roads and foundation. Engineering properties of clayey soil can be improved by adopting different methods of soil stabilization.

Many stabilization methods are in practice for altering the engineering properties of the clayey soil. Common methods for stabilization of clayey soil are lime and cement stabilization. Soil can also be stabilized by chemical stabilization. Sodium Chloride is the ionic compound of sodium and chloride. A recent study shows that Sodium Chloride can be effectively dissolves in water quickly and provide enough sodium ions for exchange ionic reactions with clayey soil. Function of this chemical (sodium chloride) is to form into cluster of fine particles and bind them together. Sodium chloride dosage is added in 0.5% to 3.0% by weight of soil with 0.5% of increment in each dosage. Standard proctor test, California Bearing Ratio (CBR), consistency limits test and unconfined compressive strength (UCS) test are performed to determine the optimum dosage of Sodium chloride. Tests result indicates that both un-soaked and soaked CBR value of soil increases with the increase in dosage in sodium chloride. Soaked CBR value increases from 4.75% to 9.22% and un-soaked CBR value increases from 8.72% to 13.55% of soil mixed with 2% Sodium Chloride. UCS of the soil increases from 2.75 kg/cm² to 6.33 kg/cm² upon addition of 2% Sodium Chloride. Maximum dry density of soil increases while optimum moisture content (OMC) decreases with increment in the dosage of Sodium chloride up to 2.5% and further decreases. Maximum Dry density (MDD) increases up to 9.02% that of virgin soil. Liquid limit and plastic limit of soil decreases with the addition of Sodium chloride. Liquid limit of soil decreases up to 8.3% as compared to virgin soil. Plasticity index decreases up to 10% as compared to virgin soil.

Key words: MDD, OMC, CBR, UCS, Clayey Soil

Replacement of Silica Fume and Fly Ash with Cement Separately in Concrete

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Abstract: Concrete is unique construction material possessing superior strength and durability characteristics. But now days, concrete can be not designed important role as it uses the shape infrastructures. Concrete itself it simply made of cement, fine aggregate, coarse aggregate and water which creates a past and fill the space within the aggregate particles. In this era, as the growth of world economy increased, the demand of concrete-made buildings are also increased. So for this the demand of cement is also increase. Unfortunately, production of cement involves emission of large amounts of carbon-dioxide gas into the atmosphere which is harmful for our environment. Approximately 1 ton of CO₂ is released into the atmosphere during the production of 1 ton of cement. With a worldwide production of approximately four million tons, the replacement of Portland cement with alternative materials has the potential to reduce the negative impacts on the environment. Whereas, leaving the waste materials to the environment directly can cause environmental problem. Some alternative has been used to reduce its high demand using cement replacement material like pozzolanic material including fly ash and silica fume. The usage of these alternative material is compatible with the environmental has been proved to improve the performance of concrete at a reduced cost. At 8 % replacement of cement with silica fume, maximum compressive strength at 28 days is achieved. At 30% replacement of cement with fly ash, maximum compressive strength at 28 days is achieved 80% which is less than our target strength. The cost of 1m³ concrete reduces by 20%, for replacement of cement with fly ash is 30%. On the other side, the cost of 1m³ concrete increases by 10%, for replacement of cement with silica fme is 8%.

Key words: Durability, Compressive Strength, fly ash, silica fume pozzolanic.

Numerical Analysis of Three-Dimensional Counter flow Multi Droplet Shower Cooling Tower with Variation in Inlet Air Relative Humidity for Industrial Application

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Abstract: The efficiency of conventional cooling tower (CCT) deteriorated due to decomposition of salt and other foreign materials on the fill surface. To eliminate this

problem, other type of cooling tower called shower cooling tower (SCT) is designed where fill is removed completely. The three-dimension (3D) SCT has been developed by help of Solid Work, and Ansys Fluent software used for SCT analysis. The validation of simulated model has been done by data obtained from the experimental setup. The ten different diameters droplets used simultaneously at a time for the study, and distribution of water droplets are based on Rosin Rammler distribution function. In This research inlet relative humidity varied from 20% to 80% and inlet constant parameters of SCT are air dry bulb temperature (DBT) 36 °C, water temperature 56 °C, water to air mass flow ratio (RLG) 0.5, and ten different droplets diameter are varies from 31.81 μm - 318.18 μm . It was observed that exit air DBT, specific humidity, droplet temperature and thermal efficiency of SCT increased with increased the air relative humidity. It is also observed that air having 20% relative humidity produce maximum cooling (22.35 °C), and 80% relative humidity air give maximum efficiency (77.03%). As relative humidity of air increased the change in total exergy of air, exergy of water, and second law efficiency (SLE) of SCT was decreased. As relative humidity of air increased, the destruction in total exergy of the system relatively decreased because low relative humidity air absorbs more amount of water from droplets.

Keywords: CFD, Ansys, Fluent, Relative humidity, SCT, Multi droplet

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Mathematical Analysis of Three-Dimensional Counter flow Multi Droplet Shower Cooling Tower with Variation in Inlet Air Dry Bulb Temperature for Human Comfort

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Abstract: This study present analysis of the three-dimension (3D) shower cooling tower (SCT). That SCT used for human comfort by reducinng the inlet air dry bulb temperature (DBT). The geometry of SCT has been developed by help of Solid Work, and Ansys Fluent software used for SCT mathematical analysis. The validation of simulated model has been done by the results obtained from SCT experimental analysis. The ten different diameters droplets used simultaneously at a time for the study, and distribution of water droplets are based on Rosin Rammler distribution function. In this research inlet air dry bulb temperature (DBT) varies from 36 - 44 °C, and other constant inlet parameters are air relative humidity 20%, water temperature 34 °C, and water to air mass flow ratio (RLG) 0.5, multi droplet diameter varies from 25.45 - 254.54 μm . Results shows that exit air DBT, specific humidity and droplet temperatures increased relatively as inlet air DBT increases; it also shows 44 °C DBT air produce maximum cooling and it cool down water droplet up to 16.07 °C. Results also shows that increase in inlet air DBT temperature, the thermal efficiency of SCT increased. The maximum thermal efficiency (69.41%) achieved by 44 °C inlet air DBT. The total exergy of air, exergy of water, and total exergy of the system was decreased with

increasing the inlet air DBT. The second law efficiency (SLE) of system was increased because exergy destruction decreased with increasing the initial air DBT.

Keywords: Ansys, Fluent, DBT, SCT, Human confort, Multi droplet

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Performance measurement of flexible manufacturing system in context to Bareilly Camphor industry

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Abstract: FMS is a manufacturing system in which there is flexibility that allows the system to react to changes, whether predicted or unpredicted. It is a highly integrated manufacturing system. Oriental Aromatics Ltd (Formerly Camphor & Allied Prod. Ltd.) is a completely integrated flavour, fragrance and aroma chemical manufacturing companies in the world today. Its three manufacturing centers are spread across the west and north of India, in Ambernath in Maharashtra, Baroda in Gujarat and Bareilly in Uttar Pradesh. It manufactures synthetic camphor, which can be utilized in several different ways. Camphor has several pharmaceutical uses. While it is most commonly used as an anti-inflammatory and decongestant, it also has several other therapeutic and healing effects. The World Health Organization's (WHO) Good Manufacturing Practice (GMP) is a system for ensuring that products are consistently produced and controlled according to quality standards. It is designed to minimize the risks involved in any pharmaceutical production that cannot be eliminated through testing the final product.

In this paper, a concept and implementation of the measuring and analysis of performance measures of FMS is applied. Also the system has been modeled. Later the mathematical technique has also been applied for the purpose of comparison and verification of the results.

Keywords: Camphor manufacturing, Synthesis of material, Process flexibility.

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Joining of aluminium alloy 7075 and magnesium alloy AZ91D by using friction stir welding

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Abstract: This study is carried out to check the ultimate tensile strength of weld join of aluminium alloy 7075 and magnesium AZ 91D by using friction stir welding. The experimentation is carried out to check at find the range of tool rotation speed and welding speed are carried out to check the response. The result showed that the range of tool rotation

speed from 250 rpm to 450 rpm and welding speed from 35 mm/min to 45mm/min gives sound weld joint between aluminium alloy 7075 and magnesium AZ 91D by using FSW.

Keywords: Aluminium alloy 7075; Magnesium alloy AZ91D; Friction stir welding; Ultimate tensile strength

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Optimization of GTA Welding Parameters for AISI 304 Stainless Steel using Taguchi Method

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Abstract: This paper presents analyze the effects of process parameters on weld distortion and depth of weld penetration of GTA welded stainless steel plate of AISI 304 stainless steel Grade. The main aim of varying process parameter is to achieve minimum weld distortion and maximum weld bead penetration or depth of penetration. Design of experiment approach was used to plan and design the experiment to study the effect of welding process parameter on weld penetration of GTA welded stainless steel plate of AISI 304 stainless steel grade. Four input parameter- welding current, gas flow rate, root face and welding speed were selected to ascertain their effect on the distortion and depth of penetration. L9 Orthogonal Array technique is used to formulate the experiment layout. From the results obtained it is found that the Welding speed (WS) is the most significant parameter for distortion during gas tungsten arc welding. The recommended parametric combination for optimum distortion is welding current (90 A), gas flow rate (10 LPM), root face (1 mm) and welding speed (31.578 mm/min) and the optimum response value is 2.3996 mm. A confirmation experiment was also performed and verified for the effectiveness of the Taguchi method and the % error between predicted optimal and experimental values for selected response parameters were found well within the acceptable limit.

Keywords: GTA welding, distortion, AISI 304 stainless steel, depth of penetration, Taguchi method.

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Experimental and Theoretical Investigation of Heat Transfer by Electrically Heated Square or Rectangular Surfaces

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Abstract: An experimental work was done to determine the heat transfer from a electrically heated square/rectangular surface. The surrounding medium air is considered & the transfer of heat takes place by means of natural or free convection process. The free

convection air flows as a result of temperature difference, which causes a density variation & this density variation introduces a buoyant force which results in fluid flow near the surface. Experiment was done on a flat plate kept at temperature of 348 K to 366 K. The experiment was carried out in an A.C. room so that the surrounding air temperature is kept constant within the limit 293 K to 297 K. The rectangular flat plate with its heated surface facing upwards moved through different angular positions. The experimental values of the temperature were recorded at various distances. In vertical position, the data obtained agrees well with earlier experimental work. The experiment shows that the temperature distribution is not affected with the increase in distance from the leading edge of the plate for horizontal position. Effect of different angular position of plate on heat transfer is shown.

Key words: Free convection, Laminar flow, heat transfer coefficient, rectangular surfaces.

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Processing and Wear Behaviour of 3D Printed Studied Polylactic Acid

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Abstract: This paper will emphasize the processing and wear behaviour of 3D Printed Polylactic Acid (PLA) material. Polylactic Acid (PLA) based plastic is one of the widely used materials in fused deposition modelling applications because it is easier and more convenient to use for 3D printing. The development of rapid prototyping gave the consumer the ability to form a prototype or component of the prototype that can be directly used in assemblies and product testing for short or medium production with least time consumed. Fused deposition modelling is a rapidly growing additive manufacturing technology due to its ability to build functional parts having complex geometries. The mechanical properties of build parts depend on several process parameters. To determine the mechanical behaviour, it is important to understand the material properties of raw PLA, using Design of Experiment (DOE) approach. The process parameters of FDM includes build orientation, layer thickness, raster angle, infill type and infill density. By using the FDM process, a cylindrical pin is made from PLA material. This cylindrical pin is tested on a pin-on-disk machine which will help us to know the wear rate and coefficient of friction of the material through graphs. In this way, a tribological test of PLA material is performed.

Keywords: 3D printing, ABS, DOE, Taguchi, Rapid Prototyping.

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Analyzing the Effect of Contact Area on the Tribological Behaviour of Die Steel

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Abstract: In this paper, the effects of contact area on Tribological behaviour of die steel was studied. Die steels possess high wear resistance, strength and hardness. As, die steels are high carbon steels. Die steels are heat treatable. So, in order to increase wear resistance, strength and hardness of die steels, few alloying elements like chromium, tungsten, vanadium, manganese, and molybdenum can be added to the composition. Thermal imaging camera was used to capture the exact temperature reached at the junction of the contact surface. Microscopic images were also taken to see the enlarged view of wear surfaces of pin as well as discs too. Tribological tests were carried out, without lubrication, on a pin on disc test rig. Cylinder on flat contact configuration was adopted. The results showed that, the variation in the wear and coefficient of friction depends on the contact area. The final original results are shown in this paper.

Keywords: 3D printing, ABS, DOE, Taguchi, Rapid Prototyping.

ICARI-ME-20-01-33

Development and characterization of Environment friendly carbon coating for piston ring applications

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Abstract: The present work was principally focussed upon development and characterization of Environment friendly carbon coating for piston ring applications using HVOF coating technique. The relationship between mechanical and tribological properties with inherent carbon coating for piston ring applications. The present work opens a new prospect for growth of carbon coating which enhances the tribological performance (COF, wear) and mechanical properties (micro-hardness, residual stress). The HRXRD, Raman spectra and FESEM attached EDS were used to confirm surface morphology and presence of carbon coating on steel substrate, with good tribological properties and excellent mechanical properties. High temperature wear experiments were conducted at variable temperature (30, 150, 300, 450, 600°C), demonstrates carbon coating was temperature dependent. Typically enhanced micro-hardness (720.4 HV), lowest residual stress (-5 MPa), COF (0.2), wear (50 micron) and frictional force (4N) were obtained at 600°C temperature for composite coating.

Keywords: Carbon coating; FESEM; HRXRD; Raman spectra; wear test.

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Parametric evaluation of PTSC integrated combined (partial heating SCO₂ and ORC) cycle – A exergy and energy analysis

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Abstract: In this study exergetic and energetic analysis of PTSC integrated combined (partial heating SCO₂ and ORC) have been done with the help of computer program using engineering equation solver (EES) software. Six organic working fluids such as R1224yd(Z), R1234ze(Z), R1234yf, R1234ze(E), R1334zd(E) and R1243zf have been selected for bottoming ORC. Main exergetic and energetic parameters

such as exergy destruction rate, thermal and exergy efficiencies and total exergy destruction for each component are examined. Variation of these parameters with solar irradiation, SCO₂ turbine inlet pressure, the effectiveness of recuperator, split ratio and solar irradiation incidence angle are also examined. It is seen that combined cycle has maximum thermal and exergy efficiency at R1233zd(E) approximately 48.61% at 950 W/m² and 83.26% at 950 W/m² respectively. Further, major part of exergy destruction rate has been found in the solar collectors only which is the 62.93% of the total exergy destruction rate of the whole plant. Moreover, thermal efficiency of combined cycle increase with split ratio which is maximum around 50.81% at split ratio 0.6 for R1233zd(E), decreases with increases in solar incidence angle i.e. maximum around 48.61% at 30 for R1233zd(E). Working fluid R1233zd(E) and R1243zf are found as best and worst fluid respectively.

Keywords: Exergy and energy analysis, Partial heating SCO₂, ORC, PTSC.

ICARI-ME-20-01-35

Study of Tribological Behavior of 3D Printed Acrylonitrile Butadiene Styrene Material

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Abstract: The paper presents a study of mechanical properties of 3d printed Acrylonitrile butadiene styrene (ABS) material. Acrylonitrile-butadiene-styrene (ABS)-based plastic is one of the most widely used filament materials for fused deposition modeling (FDM) applications. Rapid Prototyping (RP) technologies provide the ability to fabricate initial prototypes from various model materials. Stratasys Fused Deposition Modeling (FDM) is a typical RP process that can fabricate prototypes out of ABS plastic. To predict the mechanical behavior of FDM parts, it is critical to understand the material properties of the raw FDM process material, using a Design of Experiment (DOE) approach; the process parameters of FDM, such as raster angle, Infill Type, Infill density & Layer thickness were examined. A model of pin is made from ABS material using the FDM process. This pin is tested on a Pin-on disk machine which will help us to tell the wear rate and coefficient of friction of the material through graphs. In this way a tribological test of ABS material is performed.

Keywords: 3D printing, ABS, DOE, Taguchi, Rapid Prototyping.

ICARI-ME-20-01-36

Welding of Dissimilar Metal Alloys by Using Friction Stir Welding: A Review

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Abstract: This main objective of this study consist the detailed study of joining of dissimilar metal alloys carried by different researchers by using friction stirs welding. The study shows the dissimilar metal welding of different aluminium alloys, aluminium to steel, copper, magnesium etc. and also shows the influence of different parameters of friction stir welding like tool rotation

speed, welding speed, tool pin profile, weld metal position and tool pin position etc. on the weld quality of the dissimilar metal joint done by friction stir welding.

Keywords: Alloy, Aluminum, tool, welding

ICARI-ME-20-01-37

Diamond Drilling-Added EDM of Inconel 718

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Abstract: The ongoing research present the electric discharge machining of Inconel 718 super alloy, extensively used in turbo machinery and aerospace industry due to its high strength and temperature resistant. The experiment has been performed using diamond-coated-tool-electrode for easily increasing the material removal rate and decrease the tool wear rate due to the presence of diamond abrasive around the tool, resulting in better machining and reduce the machining time. The novel approach for the result has been done using Taguchi's orthogonal array L9 (34) with three level of each four control factor were peak current, pulse-on-time, pulse-off-time and the rotational speed of tool electrode. In this study, the effect of varying process parameter with fixed machining time and constant spark voltage been investigated on material removal rate on Inconel718 and diamond-coated tool-electrode respectively. Optimized results are as follows MMR (0.005318 g/min) by applying the critical combination of coded inputs as current (3), Ton (1), Toff (2) and speed (1) which was also verified experimentally under the 7.16% error.

Key words1: Electric Discharge Diamond Drilling, MRR, ANOVA, OA, Inconel718.

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Effects of Different Welding parameters on Weld joint Penetration in TIG welded Stainless Steel Plate

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Abstract : The effects of process parameters of TIG welding on weld depth of penetration of welded joints of stainless steel plate of SS304 grade has been studied. The optimum combination of process parameters has been suggested to achieve maximum depth of penetration. Design of experiment (DOE) was used to plan and design the experiment to study the effects of parameter on these stresses. The input parameters considered in present investigation were welding current,

gas flow rate, root face and welding speed. L9 Orthogonal Array (OA) technique was used to formulate the experimental layout. It was concluded that the maximum depth of penetration (DOP) was found at optimal setting of parameters of welding current (110 A), gas flow rate (10 LPM), root face (1.5 mm) and welding speed (31.578 mm/min.) and the optimum response value is 5.6961 mm.

Key words: DOE, OA, S/N ratio, AISI 304 stainless steel, DOP, Taguchi method.

ICARI-ME-20-01-39

Design and Analysis of Crane Hooks of different Materials by using Analytical and Finite Element Methods

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Abstract: Crane Hooks is widely used as a lifting device. In this article, the crane hooks made from different materials have been analyzed by using commercial software Abaqus. The two different materials used are Al7075-T651 and Dual-Phase Steel. The stresses at critical section are found analytically and results are compared with solutions obtained with Finite Element Methods. It is found that stresses at different cross-sections of crane hooks obtained analytically have approximately matches with the numerical solution.

Keywords: Crane Hook, Finite Element Method, Al7075-T651, Dual Phase Steel.

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Analyzing the wear behaviour of ABS and PLA produced by Fused Deposition Modelling

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Abstract: Fused Deposition Modelling (FDM) is in practice a lot now a days and is being recognized as a significant technology for design. It demonstrates the process of design situated between conceptual design and real-world construction. It is used to automatically construct physical models from computer-aided design data or is a group of technique used to quickly fabricate a scale model of a physical part or assembly using three-dimensional computer aided design data. The “3-dimensional printers allow designers to quickly create tangible prototypes of their designs rather than two-dimensional pictures”. The 3d printer used works on FDM (Fused Deposition Modelling) in which two materials are used to make 3d models out of the design made on CAD software. The two materials used are PLA (Polylactic Acid) and ABS (Acrylonitrile Butadiene Styrene). The model of a pin will be formed using these two materials using various parameters. These parameters are – Layer thickness, infill type, infill density and raster angle. In total, we will have then six parameters which include 3d printing parameters and the two materials.

Using these 6 parameters, the design of experiments will be created using the software Minitab. Various combinations will be created in the DOE with these six parameters. The pin will be then tested on the pin-on disk machine which will help us to tell the wear rate and the coefficient of friction of the material through graphs. These graphs will help us decide the combination of parameters that have the most and the weak durability and thus can be used to create the parts we want to create for various industries. This way a comparative study of the tribological test between the two materials will be created.

Keywords: 3D printing, ABS, DOE, Taguchi, Rapid Prototyping

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A Study of Effect of the Varying Load on Tribological Behaviour of Die Steel

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Abstract: In this paper, the effects of varying load on the tribological behavior of die steel was studied. Die steels possess high wear resistance, strength and hardness. As, die steels are high carbon steels die steels are heat treatable. So, in order to increase wear resistance, strength and hardness of die steels, few alloying elements like chromium, tungsten, vanadium, manganese, and molybdenum can be added to the composition. The tribological tests were carried out, without lubrication, on a pin on disc test rig. Cylinder on flat contact configuration was adopted. The results showed that, the variation in the coefficient of friction and wear depends on the load. Microscopic images were also taken to see the enlarged view of wear surfaces of pin as well as discs too. Thermal imaging camera was used to capture the exact temperature reached at the junction of the contact surface. The final original results are shown in this paper.

Keywords: 3D printing, ABS, DOE, Taguchi, Rapid Prototyping.

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Design, Analysis and Prototype Development of Railway Coaches for Different Loading Conditions & Optimum Dimensions in consideration with Balancing of Tracks

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Abstract: Indian Railway is a rapidly growing field of research, and extensive efforts are being

spent with the aim of improving the reliability and availability of railway systems and of substantially reducing maintenance costs by switching from time-based to event-driven maintenance policies. This Project is aimed at proving that effective Analysis can be applied also on already existing Railway Wagons & Tracks. To do this, and focusing on National and International standards, We are going to develop a Designed prototype of Railway Coaches/wagons for the different loading conditions for optimum dimensions of wagon in consideration with balancing of tracks and platform loading-unloading of Rolling stock System. With a propose to design, develop, integrate, and test a Prototype of Railway Wagon & Tracks of Indian Railway that will have a conformable system for transportation of the locomotive/electric Engines. All the components of the Coach or wagon of engine has been rolled out on the track. Where we apply the vibration intensity ultrasonic testing and This allowed to examine them and to assess if damage indexes corresponded to actual faults. A huge amount of data has been collected and it was possible to assess that the overall system cannot be considered as in stationary operation, neither when the train speed is constant nor when the same track is travelled. Many different techniques have been developed and tested with the aim of detecting damages, design optimization via simulation, and material research for the Accident Prevention.

Keywords: Tracks, Dynamic loading, Maintenance, Prototype, Locomotives, Simulation, Balancing, Material Research & Ultrasonic Testing

ICARI-ME-20-01-43

A Methodological Comparison of Three Approaches for Product Development using Fuzzy TOPSIS

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Abstract: The elevated erudition of New Product Development (NPD) requires involvement of a cross-functional team viz, innovation, design, marketing, sales, pricing, business model creation, product strategy, finance, user experience design, and technical architecture. In such condition it's hard to fix the product design process. Several methodologies are proposed in literature for product design. Three of these methodologies – Quality Function Deployment (QFD), Lean UX and Phase-Gate process – are compared. This paper aims to apply the concepts of Fuzzy Multi Attribute Decision Making (MADM) to choose the most appropriate design-making process for our design. Distance between two triangular fuzzy numbers is calculated by Hamming Distance and centroid-centroid distance method, which further applied to Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) for Fuzzy Numbers. Finally, to obtain preference ranking for the set of alternatives, Group Decision Making model is applied.

Keywords: Engineering Design, Fuzzy MADM, NPD, Product Design Methodologies

Manufacturing of aluminum casting using High Pressure Die Casting Machines

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Abstract: Die-casting offers the user a means of obtaining the dimensional accuracy and good surface finish in several alloys, with a wide range of mechanical and physical properties. It is possible to obtain great complexity of configuration; perhaps best exemplified in the many large die-castings which feature in automotive transmissions. All these qualities moreover are achievable over a large size and weight range – from a fraction of a gram to forty kilograms or more. In design terms, die casting applications range from the pins, which secure wristwatch balance springs to one-piece automobile engine cylinder block. Wherever the need for dimensional invariance is coupled with reasonably large quantity requirements, there is a possible application for a die cast component. What large quantity means in practice is that the high cost of manufacturing the steel die – which must be produced to a level of accuracy greater than that required for the component to be die cast.

Keywords: Die-casting, Manufacturing, Automobile engine, aluminum casting.

Fabrication and Characterization of PVA Based cross-linked film with Oxalic Acid

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Abstract: Different properties are point of attractive as per their field of application now days. A synthetic polymer such as PVA is one of the polymers which have recyclability and degradable properties. PVA is colorless, water soluble and have a unique property that it is not produced in polymerization reaction. PVA is produced by dissolving another polymer i.e. polyvinyl acetate (PVAc) in alcohol such as methanol and treating it with alkaline catalyst such as sodium hydroxide. In the present work main focus is to decrease water solubility along with improvement in mechanical properties. Oxalic acid (OA) was used as a crosslinker with PVA. Main parameter were concentration of oxalic acid (wt %), Curing Temperature (°C) and curing duration (Minutes). Water absorption test were performed to check water solubility, of PVA film crosslinked with oxalic acid. Mechanical characterization of films was done by tensile test which determines the UTS (ultimate tensile strength), % elongation and Young's modulus. ANOVAs analysis was also

performed to measure the impact various factor on the properties of PVA film. It was observed in present work that water solubility decreases with increase in wt% of oxalic acid. Major factor was curing time duration. UTS of crosslinked film was increased by 142% as compared to neat PVA and maximum value of Young's modulus was found 5857 MPa whereas neat PVA was only 1469MPa.

Keywords: Cross-linking; PVA, Mechanical Characterization

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Experimental Study to Increase the Mileage Covered by an Electric Car Using Combo Batteries

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Abstract: In this study, it is investigated that the reliability of an electric car in terms of mileage covered can be increased by using a combo battery system in place of a single battery. The batteries can be on-board recharge by some means like DC generator. The working model of the proposed system consists of a microprocessor (Arduino UNO), Relays, LCD display, Capacitors, Resistors, Switches, Transistors, Voltage regulators, Potentiometer, DC motor, DC generator, Li-ion batteries. All components are connected in such a manner that at a time only one battery is supplying the power to the motor; the second battery remains idle (maybe in charging mode) during that period. As soon as the voltage of the first battery drop below the pre decided value, the microprocessor shifts the whole system to the other (second) battery and the generator charges the first battery; without interrupting the movement of the vehicle. This study can help in increasing the reliability of electric cars in the future.

Keywords: Electric Car, Emission, Reliability, Mileage, Battery

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Identification and removal of barriers for effective TQM implementation

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Abstract: Critical Success Factors (CSFs) are determined on the basis of set strategic goal of any organization, but the barriers are also invariably present as well. This paper aims to identify and analyze TQM implementation barriers into an organizational system. Those CSFs which

performed below the threshold require most urgent improvement and identified as barrier. If quick action is not taken, then the obstacles existing within the system that could block target goal achievement. The methodology is based on systematic literature review as well as a case study. The paper presents a fuzzy based identification model of the barriers into some organizational aspects.

Key Words: Total Quality Management, TQM, Critical Success Factors, CSFs, Fuzzy Logic.

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Flow characteristics around a body under Turbulent Boundary Layer

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Abstract: By using atmospheric wind tunnels in which atmospheric boundary layers like those typical of the field situation were simulated, flow comparisons have been made for an unusually wide Reynolds number range. Neutrally stable atmospheric boundary layers were simulated using the classical 'roughness + castellated fence + mixing grid' method, with specific design (and cube sizes) chosen to ensure that values of the more important salient parameters characterizing the upstream flow were as close as possible to those of the field situation. An order of magnitude variation in Re was achieved in the two tunnels, whilst keeping all upstream flow variables constant; the field situation provides a further order of magnitude. Using measurements of mean and fluctuating surface pressures and velocities just above the top of the cube, it will be demonstrated that Re effects on the mean flow are relatively small whereas the effects on fluctuating pressures and velocities are much more significant. The results will be discussed in terms of the influence of the spectral content of the upstream flow and modelling implications will also be addressed.

Keywords: LES, Synthetic inflow, Correlation, Various oscillation

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Smart Dairy Product Supply System with Real-time Monitoring System

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Abstract: Rural people are facing lots of problems due to improper and inefficient supply systems of their dairy products. Unemployment in the rural areas leading them to migrate to another area or urban area which is creating the problem of urban congestion and a decrease in urban employability rates. Technology

can solve this problem in a more efficient way than the presently classical supply system. The principal aim of this paper is to discuss the challenges rural people are facing for the dairy product supply system and how technology can solve these challenges. A digital locking facility will ensure the true product quality and real-time monitoring system will help in monitoring the product on the way. The exact income level of the rural people would be found out if the supply system is totally monitored. Lastly, this paper will discuss the power of data to solve the problem of shortage and surplus and when the government should intervene in the process.

Keywords: Smart Dairy Product; Real-time Monitoring System; product quality; digital locking facility.

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Reduction Study of Iron Ore Pellets with Wooden Bark Char

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Abstract: In the process of iron making reduction of iron ores to metallic iron is done by coke which acts as a reductant. As, both the reduction process, conventional blast furnace and DRI technologies are driven by the Boudouard reaction, so there is a probability for substituting of coal/coke with biochars, which could provide a good source of carbon and energy for the reduction. Hence, the utilization of biochar can become an emerging technology and better option for replacing coking coal for metallurgical purposes. This study includes characterization and comparative study of reduction of Iron ore pellets and fines using Wooden Bark Char (WBC) as one of the biomass waste. From the results, reduction of iron-ore fines with comparable ratios with WBC gives the maximum degree of reduction than reduction of iron-ore pellets.

Thus, WBC can play an important role in behind the premium quality of coking coal reserves.

Keywords: Wooden Bark char; Reduction; Iron ore fines/pellets; Pyrolysis; Gross Calorific Value; Biochar

ICARI-ME-20-01-51

Impact Analysis of Integrating Wind Power with National Grid of Nepal

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Abstract: The electrical grid has great impact of integrating wind energy. Wind power penetration levels of 20 MW (2.75%), 50 MW (6.88%), 100 MW (13.76%) and 150 MW (20.64%) were considered. The power generation data from Nepal Electricity Authority (NEA) along with wind power production at Kagbeni data were used to analyze the impacts of wind integration. Further, a statistical summary of the changes in the regulation and load following time frames was conducted. The statistical results demonstrated that the impact of wind power upon regulation is very small. For wind input in the NEA generation system using geographical aggregation as 12 MW from Kagbeni and 8 MW from Pyuthan showed that variability was reduced up to some extent than taking power from only one site Kagbeni. Load following results demonstrated that the standard deviation of hourly generation changes showed little change for 20 MW of wind power and increased only modestly for up to 150 MW of wind power. The relatively modest increase in the standard deviation, even at 150 MW, is indicative of the substantial amount of variability already managed by NEA and suggests that absent the physical generation resources available are sufficient to handle wind variability.

Keywords: Wind Power, Wind Integration, Electrical grid, Load following

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Simulation of flow parameters and magnetic forces in machining of internal CAM through viscoelastic magnetic abrasive flow finishing process

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Abstract: This paper consists of the simulation of flow parameters for an internal cam finished through viscoelastic magnetic abrasive finishing process. Viscoelastic medium comprises Silicone oil and other additives which exhibit viscoelastic properties throughout the finishing process as the change in the temperature does not affect the viscosity of the medium. Carbonyl particles along with Silicon carbide of grit size 800 are thoroughly mixed with the medium prepared. Due to the cohesiveness in the viscoelastic medium, it does not stick to the surface of the internal cam. As the Viscoelastic magnetic abrasive medium flows through the internal cam surface, it is subjected to Magnetic forces generated by arc magnets made of NdFe 35 material, kept at 90° phase difference. Due to this Carbonyl particles, which are Ferro magnetic in nature re orient themselves and the abrasive particles would be thrown to the internal surface of the cam. As the abrasives slide tangentially to the internal surface of the cam and the forces involved during the flow are much higher, the machining of the surface takes place. In the present paper simulation has been made for finding the flow parameters using Ansys 16 and Magnetic field distribution is found using Ansys Maxwell simulation software. The result so obtains claims that the process is suitable for machining the internal cams and the complex shaped object.

Keywords: Viscoelastic Magnetic Abrasive Finishing, Carbonyl Particle, Magnetic Field.

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Effects of Sinusoidal Laser Texturing on Piston ring material under Non-Lubricated Conditions

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Abstract: The Principle Objective of the following paper is the experimental investigation and study of tribo dynamics on EN-24 and Textured Silver Steel Interface using the help of a tribometer for conduction of experiment, negative sinusoidal textured pattern was produced on the pin surface. The values of Coefficient of Friction, Wear Rate along with the variation in temperature in the entirety of experiment were measured with pre-defined operating parameters which are sliding velocity, load applied, and the total distance traversed over the course of wear for different diameters of the specimen. The experiment was performed under dry conditions. This cylindrical pin is tested on a pin-on-disk machine which will help us to know the wear rate and coefficient of friction of the material through graphs. In this way, a tribological test of PLA material is performed.

Keywords: 3D printing, ABS, DOE, Taguchi, Rapid Prototyping

ICARI-ME-20-01-54

Analysis of Tribological behaviour of Textured Surface of High Chromium Steel under Dry Conditions

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Abstract: The paper holds the purpose of analysing the effects of Dot-patterned laser texture on piston ring material under Non- Lubricated conditions. It aims at carrying out experiments for studying the tribological behaviour of the textured silver steel piston ring material when worked with EN-31. With defined working parameters for the experimentation, likethe track distance travelled, sliding velocity, and load appliedover the course of wear for different diameters of specimens used. For the course of the experiment the values of rate of wear, coefficient of friction, and temperature change were measured. The experiment was conducted under non- lubricated conditions. This study is helpful in the better understanding of the potential of the texturing on the surface, leading to the variation in friction and wear resistance for IC engines' piston cylinder interface.

Keywords: 3D printing, ABS, DOE, Taguchi, Rapid Prototyping

Identification of the barriers of reverse supply chain

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Abstract: Reverse supply chains represent an opportunity to create a value stream, not financial loss. Reverse supply chains deserve as much attention at the corporate level as forward supply chains and should be managed as business processes that can create value for the company. Many manufacturing firms have not yet adapted reverse supply chain but view it as the great nightmare to their organizational system. Like many other system, reverse supply chain has also its critical success factors. This research aims to identify the barriers of reverse supply chain management which invariably present in the system. Among the critical success factors, those perform below the threshold were identified as barrier using fuzzy logic technique.

Keywords: RSC, Barrier, Fuzzy, SC, Critical success factor.

Fabrication of Rapid Compression Machine with Variable Compression Ratio -A Review

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Abstract: The Rapid compression machine (RCM) is an excellent tool to direct measure ignition delay (ID) of combustible mixtures at a high pressure. This paper, highlight the method to assemble a RCM with adjustable stroke length and compression ratio. The assembled RCM consist of mainly three parts; driver cylinder assembly, piston assembly and receiver cylinder assembly. Driver cylinder assembly consists of piston cylinder with combustion chamber, multi-hole nozzle to inject the fuel, piezoelectric sensor, pressure gauge to measuring the in-cylinder air pressure, electric heater to heat the compressed air, heated plate to ignite the fuel. Piston assembly is the middle portion of RCM acts as a connector of the Driver assembly and Receiver assembly. Receiver cylinder assembly also contain the piston cylinder and this piston is connected to another piston through the piston rod, which is fitted inside the driver cylinder and mainly consists of fuel injector, pressure gauge for measuring in-pressure cylinder and temperature sensor to measure heated air temperature, air heating coil Receiver cylinder contains movable plates which is used to varying the movement of length along the axial direction to varying the clearance volume. The present RCM is based on the concept of combustion of charge (fuel + air) in both cylinders placed in opposite ends which is different from the concept used in the earlier RCMs. In the earlier RCMs the energy is created inside the driver cylinder by increasing the temperature and pressure with the help of the compressor and heater rather than by using the combustion process.

Keywords: Variable Compression Ratio, Rapid Compression Machine, Multi Hole Nozzle, Sensor

Organic waste management for current environmental concern

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Abstract: In this study effects of organic and inorganic wastes on the environment are studied and proper solutions to the various problems are suggested. After that, survey of various sites is done to understand how the waste management is done at a large scale. The end goal is to effectively implement the 3 R's (Reuse, Reduce and Recycle) so that utilization of various resources can be reduced and the amount of waste generated can be reduced. Some simple ways for a sustainable living were suggested which are easy to implement in our daily lives.

Keywords: Organic and Inorganic waste, Waste management, 3R's, Bio-degradable waste.

Effect of additive on performance and emission of biodiesel fueled compression ignition engine

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Abstract: Due to augmenting awareness about climate change and diminution of fossil origin fuels, comprehensive research is carried all around the globe to evaluate the suitability of variety of alternative fuels. In this scenario, the usage of biofuels is considered a promising solution. The present study deals with the preparation of biodiesel using palm oil as biofuel in varying concentration along with aluminum oxide (Al_2O_3) nanoparticle as an additive. The biodiesel was tested on a single-cylinder four-stroke diesel engine at a constant speed of 1500 rpm at various loads and compression ratios. The results show that increasing the nanoparticle concentration in palm oil blends results in increase in brake thermal efficiency as the catalytic behavior of Al_2O_3 accelerates the combustion process and reduces CO and HC emissions.

Keyword: Diesel engine, biodiesel, emission, nanoparticle.

Performance analysis of modified vapor compression refrigeration system using ecofriendly refrigerants

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Abstract: An Exergy method for theoretical analysis of a traditional vapor-compression refrigeration system equipped with liquid vapor heat exchanger (lvhe) for refrigerants like R134a, R423A, R507A, R1233zd (E), R1234ze (Z), R1234ze (E) and R1243zf were carried out. All are ultra-low GWP and zero ODP refrigerants and comparison of the results with HFC-134a refrigerant as possible alternative replacements in automotive air-conditioning and stationary refrigeration is presented. A mathematical computational model has been developed for calculating Coefficient of performance (COP), exergetic efficiency, exergy destruction and efficiency defects for the above mention refrigerants. During the investigation, condenser temperature is kept at 313K and 323K; evaporator temperature is kept in the range from 223K to 273K. Results obtained for selected condenser temperature are compared and discussed elaborately. It indicates that R1234ze (Z) can be a good drop-in replacement of R-134a and R1234ze (Z) can replace the R-134a after some modifications as the results are almost similar. Among the system components, evaporator shows highest efficiency defect value and liquid vapor heat exchanger shows the lowest.

Keywords: Coefficient of performance, Exergy destruction ratio, efficiency defect, exergy efficiency, Evaporator temperature, Condenser temperature.

Enhancement of heat transfer in solar parabolic trough air heater: an experimental study

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Abstract: Experimental analysis of solar parabolic trough air heater using various types of heat absorbing receivers has been carried out at KIET Ghaziabad (UP). To collect the heat, air flows through the receiver (absorber tube), placed at focal length of PTC. Various types of receivers namely copper tube, copper tube filled with pebbles, copper tube painted black and evacuated tube have been used. The maximum instant energy efficiency of 23.39% has been obtained using ETC absorber, 23.09% with copper tube filled with pebbles, 21.9% with black painted absorber and 21.0% with using copper tube alone. It has also been found that increase of average daily efficiency is about 6.0% with the use of copper tube filled with pebbles as compared with absorber using copper tube or black painted copper tube. Maximum instant exergy efficiency has been found to be 1.52% using evacuated tube at 14:00 hrs and insignificantly higher than pebbles filled copper tube (1.51%).

Keywords: Parabolic Trough Air Heater, Various Receivers, Energy Efficiency, Exergy Efficiency, Solar Radiation

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Effect of Heat Treatment Process on the Mechanical Properties of Die Steel

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Abstract: With the advancement in the mechanical industries, the demand of advanced material with high hardness and strength are increasing. The heat treatment process is performed on the ferrous materials to attain the desired properties. The choice of a particular heat treatment process depends upon the desired mechanical properties. In this paper, annealing, normalizing and hardening heat treatment processes have been conducted on the die steel material and effect of these processes on the hardness, toughness and strength has been investigated. The various mechanical tests were performed as per the ASTM standards and from the experimental results, it was observed that the normalizing and hardening process improved the strength and made the material harder as compared to the annealing process. The annealing process helped in making the material softer.

Keywords: Heat treatment, steel, hardness, toughness, strength.

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Development of Green Metal Matrix Composite Using Seashell and B₄C as Reinforcement

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Abstract: Aluminum hybrid composites are a new generation of metal matrix composites that have the potentials of satisfying the recent demands of advanced engineering applications. With the growing demand of advanced engineering materials in the field of production and manufacturing, composite materials have been under consideration and research by various researchers and practitioners. It is obtained by dispersing the reinforcements in the metal matrix to improve the properties of the base metal like strength, stiffness, conductivity, etc. The increasing popularity and demand of environmentally friendly products and government policies and regulations to incorporate sustainable practices in manufacturing of goods has put extensive

pressure on industries to utilize agricultural and industrial waste in their production system. The present work aims to utilize Seashell in the production of metal matrix composites (MMCs) using the most widely used stir casting process which could be used for the manufacture of various components in automobile and aircraft industries with reduced weight and increased strength. Seashell is a fibrous waste obtained from the seas and oceans. The idea is to use this waste in the fabrication of low-cost composite materials.

Keywords: MMC, Seashell, B4C, Green MMC

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Analyzing the Green Metal Matrix Composite on a Linear Reciprocating Tribometer

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Abstract: Aluminum hybrid composites are a new generation of metal matrix composites that have the potentials of satisfying the recent demands of advanced engineering applications. With the growing demand of advanced engineering materials in the field of production and manufacturing, composite materials have been under consideration and research by various researchers and practitioners. It is obtained by dispersing the reinforcements in the metal matrix to improve the properties of the base metal like strength, stiffness, conductivity, etc. The present work aims to analyze the developed green metal matrix composite (MMC) using the widely used Pin-on-Disc test rig, these results can be further used in automobile and aircraft industries. Thermal imaging camera was used to capture the exact temperature reached at the junction of the contact surface. Microscopic images were also taken to see the enlarged view of wear surfaces of pin as well as discs too. The tribological tests were carried out, without lubrication, on a pin on disc test rig. Cylinder on flat contact configuration was adopted. The final original results are shown in this paper.

Keywords: Pin-on-Disc, MMC, Seashell, B4C, Green MMC

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Technological Advancements in Controlling and Measuring Automotive Emissions

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Abstract: Automobiles are the major contributors to global warming and climate change- 17.8% of the world's energy related greenhouse emissions come from on road vehicles and about 10% from automobiles. (1) One of the strongest cases of automobile pollution can be seen in India's

capital, New Delhi. This report summarizes the importance of checking automotive emissions and how due to increase of hazardous pollutants in the very air we inhale in our city has turned our homes into gas chambers. In the advent of increase in number of lethal pollutants like CO₂, HC, VOC, CO, NO_x and PM, the technology required for their testing also must be updated as the norms for acceptable vehicular emissions are updated. Hence, this report focuses on the various new norms that have been implemented in the country regarding testing a vehicle for emissions and due to the new laws, the tech that is required to fulfill this and how that it's different from the previous set standards and technology.

Keywords: Global warming, Climate change, Pollutants

ICARI-ME-20-01-65

Study of piezoelectricity in vehicle

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Abstract: The article provides a study of the relation between the parameters characterizing piezoelectric materials properties relevant for energy harvesting device (EHD) harvesting energy vibrational motion. Furthermore, the performance of piezoelectric material has been compared with respect to their output. Some EHD like electromagnetic, electrostatic and piezoelectric method. As the vehicle moves a new area of the tire continually deforms and relaxes in a cyclic pattern whose frequency is dependent upon the speed of the vehicle. At the suspension of the vehicle, as the vehicle moves the stability in road and bumps gives sudden jerks which leads to continuous compression and expansion. Only on the engine periphery due to continuous vibration. At the top of the vehicle body in certain cases like rainfall. This energy conversion process occurs when the rain drops points on the Polymer surface called lead zirconate titanate (PZT) produces inelastic beat above its surface.

Keywords: Piezoelectricity, electromagnetic, electrostatic, piezoelectric method.

ICARI-ME-20-01-66

Design and Fabrication of Rocker-Bogie Suspension for a Planetary Rover Prototype

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Abstract: In light of the notable rocker-bogie mechanism, this paper shows an ideal plan of a rocker-bogie suspension framework so as to ensure high mobile steadiness as well as excellent versatility of a prototype rover vehicle while traversing through rough terrains. It is essentially a suspension arrangement utilized in mechanical automated vehicles used explicitly for space investigation. The rocker-bogie suspension-based rovers have been effectively presented for the Mars Pathfinder and Mars Exploration Rover (MER) and Mars Science Laboratory (MSL)

missions led by zenith space investigation laboratories all through the world. The proposed suspension framework is presently the most supported structure for each space investigation organization. It is basically a mechanism which comprises of two arms with wheel mounted to each and the two arms are associated through a versatile joint. The current development in design has been studied as well as a different approach towards designing the basic structure of suspension has been done. It has been further verified using various static and dynamic load calculations, solid modelling computer aided design software and simulation software for analysis and testing.

Keywords: rocker-bogie mechanism, suspension-based rovers, Mars Exploration Rover (MER), Mars Science Laboratory (MSL).

ICARI-ME-20-01-67

Fabrication of Rapid Compression Machine with Variable Compression Ratio -A Review

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Abstract: The Rapid compression machine (RCM) is an excellent tool to directly measure ignition delay (ID) of combustible mixtures at a high pressure. This paper highlights the method to assemble a RCM with adjustable stroke length and compression ratio. The assembled RCM consists of mainly three parts; driver cylinder assembly, piston assembly and receiver cylinder assembly. Driver cylinder assembly consists of piston cylinder with combustion chamber, multi-hole nozzle to inject the fuel, piezoelectric sensor, pressure gauge to measure the in-cylinder air pressure, electric heater to heat the compressed air, heated plate to ignite the fuel. Piston assembly is the middle portion of RCM acts as a connector of the Driver assembly and Receiver assembly. Receiver cylinder assembly also contains the piston cylinder and this piston is connected to another piston through the piston rod, which is fitted inside the driver cylinder and mainly consists of fuel injector, pressure gauge for measuring in-cylinder pressure and temperature sensor to measure heated air temperature, air heating coil. Receiver cylinder contains movable plates which are used to vary the movement of length along the axial direction to vary the clearance volume. The present RCM is based on the concept of combustion of charge (fuel + air) in both cylinders placed in opposite ends which is different from the concept used in the earlier RCMs. In the earlier RCMs the energy is created inside the driver cylinder by increasing the temperature and pressure with the help of the compressor and heater rather than by using the combustion process.

Keywords: Variable Compression Ratio, Rapid Compression Machine, Multi Hole Nozzle.

ICARI-ME-20-01-68

Challenges to Electric Vehicle Forecasting and Implementation in India

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Abstract: With India being one of the most populous countries in the world, Road Transportation is a significant mode of commutation, and the majority of the market is dominated by gasoline and diesel vehicles. With the world moving towards a sustainable future, adequate focus should be given to electric cars. Vehicles running on variations of lithium-ion batteries are a safer bet to a sustainable future as compared to internal combustion engine vehicles. However, electric vehicles do not occupy a consistent market share globally. That is why forecasting of electric vehicles is a critical task. With the onset of technological advancements, many studies have been conducted bearing fruitful results. This paper attempts to identify all the factors that will play a vital role in the forecasting of EV sales in India.

Keywords: Electric Vehicles, Forecasting, Challenges

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Factors affecting the location of the electric vehicle charging station

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Abstract: Electric vehicles (EV) have developed into one of the most promising transportation alternatives in recent years. India and many countries such as the USA, UK, and Australia are working on various projects and policies to increase the amount of electrically powered vehicles onto their roads in the near future to deal with continuously increasing fuel prices and CO₂ emissions. For effective implementation of such plans, suitable charging infrastructure is required to supply the electrical fuel to these vehicles. In this paper, we studied and contrasted different types of electric vehicles, electric vehicle charging stations, charging batteries and other factors such as traffic density, weather, parking space, solar power capacity, and many other factors to identify the optimum location for public charging stations within a local area. In this paper, we find the factors affecting the location of an electric vehicle charging station.

Keywords: electric vehicles; charging infrastructure; optimum location; public charging station

ICARI-ME-20-01-70

Cladding of Steels: A Review

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Abstract: Cladding is a process of depositing a thick layer of filler material on a low alloy or carbon steel base metal. Cladding has been a popular method for repairing worn out parts or for achieving a corrosion resistant surface. This paper review the data with respect to the subject of weld cladding of stainless steel on low carbon steel along with different method and different

welding techniques utilized for providing a corrosion resistant surface on base metal with their applications and effect of various process parameters on weld bead geometry and percentage dilution, utilization of mathematical equation to predict the dimension of weld structure, corrosion resistant, mechanical properties of clad component, also metallurgical element, microstructure, ferrite content, transition zone are focused. This review paper focused on the recent advancement and drives the readers towards the on-going exploration in this field. From literature review it has been discovered that a great research work has been completed yet at the same time need to investigate further in cladding process.

Keywords: Cladding, Gas metal arc welding, Bead geometry, Dilution, Corrosion resistant, Mechanical properties

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Barriers to Industry 4.0 in India

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Abstract: The purpose of this research paper is to find out the barriers in transitioning from Industry 3.0 to Industry 4.0 in India. This study uses the findings and data from various research papers, governmental organisations and other credible sources. This study is an attempt to make the Indian industrial setup aware of the barriers in transitioning from Industry 3.0 to Industry 4.0 and to take suitable measures by the data and findings provided in this study.

Keywords: Industry 3.0; Industry 4.0; Barriers

ICARI-ME-20-01-72

Comparative investigations on mechanical properties in GMAW and CMT welding of AISI 304L and AISI 202 austenitic stainless steel

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Abstract. Coalescence of dissimilar materials with different thickness is the need for growing automotive industry. Gas metal arc welding (GMAW) encounters various problems like burn through in thin plates welding, excessive spatter and high heat input. Cold metal transfer (CMT) process overcome these difficulties by dropping the current at the short-circuiting phase during welding, which ensures low heat input. This paper focuses on the comparison between GMAW and CMT welded joints of thin sheets. Mechanical properties are experimentally examine of dissimilar welded joints AISI 304L and AISI 202 using AISI 316L filler wire. CMT prevents thin welded sheets from burning compared to GMAW for the same process parameters due to extremely low heat input, which enhances the mechanical properties such as tensile strength and microhardness. Fractography analysis is done with the help of field emission

scanning electron microscope (FESEM) and energy dispersive x-ray analysis (EDX). High-resolution x-ray diffraction (HR-XRD) machine is used for residual stress measurement. Results shows that residual stress in CMT welded joints are lesser as compared to GMAW. Compressive residual stress is experienced at the weldment, which avoid cracks. Higher value of full width half maximum (FWHM) in CMT signifies higher microhardness and lower grain size.

Keywords: Dissimilar austenitic stainless steel, mechanical properties, residual stress, CMT and GMAW.

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Vertical Axis Wind Turbine (VAWT) : A theoretical study of drag type windmill and reduction of drag using valves

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Abstract: The exponentially increasing burning problems like pollution and global warming day by day, is a clear call of nature to Boycott the non-renewable energy sources like coal, gasoline, diesel, etc. for the production of power for different uses. The development of Revolutionary thoroughfares is required to produce energy so that the carbon emissions could be lower. In this research, the author had tried to theoretically make out the drag and reduce it using a simple one-way valve. The data has been collected on the simulation software of computational fluid dynamics ANSYS. The designs are made on Siemens's solid edge. In this, the vertical Axis wind turbine is as same as a cup/cone type anemometer. The cups are made up of valves as a multicellular body, instead of embedding valves in that. The sizes of valves may vary as per the size of cups/cones. These valves are arranged like cells in a plant (vegetable). This multicellular body styles of making blades of turbine may reduce the drag very significantly.

Keyword: VAWT, Drag type wind turbine, Multicellular wind turbine

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Design and fabrication of trio tube heat exchanger experimental setup

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Abstract. The important and useful implementations that come under the context of heat exchanger are the production of thermal power, waste heat recovery, air conditioning, and

refrigeration and for the food preserving purpose by evaporation, pasteurization, etc. The double concentric tube heat exchanger was the prior arrangement that didn't have a complicated overall heat transfer coefficient but had not that much of effectiveness. So later on introducing an intermediate tube to the former arrangement and eventually shows the better performance. This arrangement is known as the trio tube heat exchanger.

In this work, an experimental setup for trio tube heat exchanger is designed and fabricated. The experimental setup comprises of aluminum (inner tube 12.7 mm) and copper (intermediate tube 25.4 mm) and GI tube (outer tube 38.1 mm). The effective length of the heat exchanger is 2.1 m. For the hot fluid a 2000 W capacity immersion heater was used to raise the temperature of the water. In this experimental setup heat can be transferred between three liquids. Which is its superstitious advantage over double tube heat exchanger. Three different flow arrangements can be maintained in the heat exchanger; as cold(C), hot(H) and normal(N), the flow arrangements are; N-H-C, C-H-C and C-H-N. The performance of experimental setup was initially tested for water. The measurements were taken at 50 °C temperature of hot water and 30°C of other two water streams at inlet. The experiments were conducted for counter flow arrangements of fluid streams so that the performance of heat exchanger can be checked at maximum amount of heat extraction from hot water. The temperature variation along the length of heat exchanger was analyzed, the graphs are in good agreement with the standard graphs.

Keywords: fabrication, double tube heat exchanger, heat transfer coefficient, GI tube.

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Fabrication of Rapid Compression Machine with Variable Compression Ratio -A Review

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Abstract: The Rapid compression machine (RCM) is an excellent tool to directly measure ignition delay (ID) of combustible mixtures at a high pressure. This paper highlights the method to assemble a RCM with adjustable stroke length and compression ratio. The assembled RCM consists of mainly three parts; driver cylinder assembly, piston assembly and receiver cylinder assembly. Driver cylinder assembly consists of piston cylinder with combustion chamber, multi-hole nozzle to inject the fuel, piezoelectric sensor, pressure gauge to measure the in-cylinder air pressure, electric heater to heat the compressed air, heated plate to ignite the fuel. Piston assembly is the middle portion of RCM acts as a connector of the Driver assembly and Receiver assembly. Receiver cylinder assembly also contains the piston cylinder and this piston is connected to another piston through the piston rod, which is fitted inside the driver cylinder and mainly consists of fuel injector, pressure gauge for measuring in-cylinder pressure and temperature sensor to measure heated air temperature, air heating coil. Receiver cylinder contains movable plates which are used to vary the movement of length along the axial direction to vary the clearance volume. The present

RCM is based on the concept of combustion of charge (fuel + air) in both cylinders placed in opposite ends which is different from the concept used in the earlier RCMs. In the earlier RCMs the energy is created inside the driver cylinder by increasing the temperature and pressure with the help of the compressor and heater rather than by using the combustion process.

Keywords: Variable Compression Ratio, Rapid Compression Machine, Multi Hole Nozzle, Sensor

ICARI-ME-20-01-76

Energy and Exergy Analysis of a Quadgeneration (Power, Steam, Hot water and Low temperature Refrigeration) Thermal System for Performance Improvement using Retrofitted Techniques and Alternative Refrigerants R1234ze and R1234yf in Cascade Refrigeration Cycle

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Abstract: The current work presents energy and exergy analysis of a quadgeneration (Power, Steam, hot water and low temperature refrigeration) system for the performance improvement using retrofitted techniques and alternative refrigerants R1234ze and R1234yf in the cascade refrigeration cycle. The system comprises of a gas turbine cycle, a steam turbine cycle, heat recovery steam generator (HRSG) and a cascade refrigeration cycle. The retrofitted techniques viz. Fog cooling (FC) and steam injection to gas turbine (STIG) have been considered to enhance the performance of gas turbine cycle. The waste heat recovered from the exhaust gases of the gas turbine has been utilized in converting superheated steam for STIG and steam turbine. The stack gases are again utilized in the vapour absorption cycle of cascade refrigeration system for refrigeration production. The computation of various performance parameters viz. thermal efficiency, energetic efficiency, COP, Overall cycle efficiency, exergy destruction rate and exergy destruction ratio has been carried out using a computer program developed in Engineering Equation Solver (EES) software and the various performance parameters have been investigated with the variation in ambient temperature and relative humidity. It has been observed that the retrofitted techniques improve the power output and energetic efficiency of the gas turbine cycle as well as the efficiency of the overall cycle and the use of alternative refrigerants (R1234yf and R1234ze) establishes an ecofriendly agreement with the cycle.

Keywords: Quadgeneration, Cascade Refrigeration, Alternative Refrigerants, COP, Thermal Efficiency

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Future Development for Green Tribology: A Review

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Abstract: The resources of Earth make life possible to live. Nowadays existence of living being facing many environmental problems (like Global Warming, Air Pollution, etc.). Global warming is due to CO₂, and other greenhouse gases which ultimately leads to increase in average temperature of the Earth. The study and knowledge of Tribology can help to reduce this issue of rising temperature of the globe as most of the energy of the systems is being wasted in heat and noise due to friction, wear and improper lubrication. We should now extend Tribology to “saving energy and materials, reducing emissions, decreasing noise pollution and developing bio- and eco-lubrication”. In this regard new concepts and principles like “Green Tribology”, Green Engineering, Self-lubrication, etc. plays an important role. Green Tribology not only reduces the emissions but also the cost wasted on energy emissions. This also discusses the various tribological problems faced in renewable resources of energy like Wind Power Turbines, Tidal Power Turbines, Geothermal Energy Plants. We will discuss the challenges that come across the integration of these areas of research and the future directions of research.

Keywords: Air Pollution, Bio-Lubrication, Green Tribology, Green Engineering, Self - Lubrication

ICARI-ME-20-01-78

Thermal Performance of Single and Double Exposure Solar Air Heaters

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Abstract: In this paper, thermal performance of double flow, single and double exposure solar air heaters are analytically investigated. In single exposure solar air collector solar radiation absorbed by the absorber only through the top of the collector whereas in double exposure solar air collector solar radiation absorbed by the absorber through both top and bottom of the collector by using reflector. The performance of collectors have been analyzed with different parameters such as mass flow rate and insolation. The results show that double exposure solar air collector is better than the single exposure solar air collector. The double exposure solar air heater is 4.17% more efficient than the single exposure solar air heater at a mass flow rate of 0.0277 kg/s.

Keywords: solar air collector, thermal performance, solar air heaters, reflector.

ICARI-ME-20-01-79

Study and Analysis of Automatic Transmission Failure

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Abstract: For transmitting power from engine to front wheel through differential with different speed is paramount importance. Due to design of main drive shaft wearing of transmission housing

is very frequent. To overcome this we introduced a bush design to improve the transmission housing for interchangeability.

This experimental study is focused on transmission system used in material handling equipment's. The major failure in this type of transmission is because of wear out of transmission housing. Because of this wear out internal pressure of the housing is drops or reduces interm parts of the transmission also get affected.

In case of failure, we need to change the transmission housing or change the transmission system. Cost of new housing is approx. 2, 50,000 and cost of new transmission is approx. 5, 00,000.

In this experimental study has been undertaken to reduce above cost this is done by design modification in transmission housing or introducing new bush design in the transmission housing.

Keywords: transmission, bush, drive shaft, failure, design, wear, housing

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Study and Analysis of Tire Failure

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Abstract: In the Automobile Industry tire is the main part to transmit the power. Major defect encountered in tire is Tread Separation. It's a serious problem which is the potentially hazardous. Tire separates from the casing and tread due to any foreign material/air indent. Tread separation occurs due to heat generation at the time of running. For tire to remain durable and safe there must be a strong bond between all of the tire's specialized rubber compounds and its piles of fabric cords and metal wires. When a tread separates or becomes worn, it greatly increases the risk of blowouts and crashes.

Even though the numbers are quite low, Manufacturer's Defect is actually one of the most common causes of tread separation. Over a period of time, usually not very long, a defective tire will begin to exhibit signs of an extreme out of balance condition. Then a bump will form in the tread area. This bump is the first visual indicator that the tread is going to separate. The expansion of this bubble will increase until tire failure occurs. In this paper failures of tire tread separation are studied for better understanding.

Keywords: Tire, Tread Separation, Failure, Compounds, Material composition, Temperature

ICARI-ME-20-01-81

Study on manufacturing and quality concept of automobile compressor in Die casting

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Abstract: An air conditioner is a system or a machine that treat air in a defined, usually enclose area via a refrigeration cycle in which warm air is removed and replaced with cooler air. A car air conditioning system consists of a compact version of the components of the normal air conditioner that are evaporator, compressor, condenser, expansion device and a fan which are fitted in a car to provide air condition inside the passenger's compartment. Independent control of the two compressor speeds allows flexibility to match the two compressors under different conditions. Interlocks allow safe changes from one method of operation to another while the equipment works and prevent misuse. For safety, all pressurised lines have relief valves. To help produce pressure and volume diagrams, equipment offers the optional Pressure Indicator (GT103a). It fits to an adaptor on each of the two compressors to measure the pressure changes during a compression cycle. One Pressure Indicator is enough to test each compressor, one at a time. However, you may choose to use two for convenience.

Keywords: Refrigeration, car air condition, compressor

ICARI-ME-20-01-82

Study and development of lubrication fluid for continuously variable transmission

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Abstract: Lubricants play an important role to decrease the frictional force and wear rate at tribopair. The system that have relative motion contains element in contact creates noise, vibration and prone to catastrophic damage. There is need to develop better lubricant for the increase of sustainable life cycle of system. The study was carried out to develop noval lubricant used in continuously variable transmission system on V-belt test bench and tribometer. The noval lubricant showed better torque transmission capacity and less coefficient of friction and wear rate compared to conventional lubricant at the interface of elements had relative motion.

Keywords: Lubricants, Tribopairs, Coefficient of friction, Wear rate, V-belt test bench, Tribometer.

ICARI-ME-20-01-83

Comparison of Finite Element Solutions with Analytical solutions for a Rotating Disc

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Abstract: Rotating disc are mostly used as turbine rotors which rotate at high speeds. During the design of the rotating disc, it is required to know the variation of principal stresses such as hoop stresses, radial stresses. In this research paper, the variation of these stresses is obtained analytically. The use of the numerical solution validates this solution. Here, the finite element method is used for numerical solution. The commercial software Abaqus of version 6.12 is used for the evaluation of stresses developed in rotating disc due to rotation of disc at high speeds. In this problem, two types of elements are used such as shell elements (S4R) and solid elements (C3D8) used for analysis.

Keywords: Rotating Disc, Von Mises stress, hoop stress, radial stress and Abaqus 6.12.

ICARI-ME-20-01-84

Evaluation of the effect on natural frequencies at different locations of cracks for a three-point bend notched specimen

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Abstract: The natural frequency has a very critical role when any structure is subjected to dynamic loadings. This article evaluates the frequencies of notched three-point bend edge specimens. The geometry of the rectangular beam is (10x20x100). The frequencies of the specimen have been evaluated at different locations of notches along the length of the specimen. The natural frequencies obtained analytically at different location of beams are compared with frequencies that obtained through Finite Element Methods. During the investigation, the frequency of the beam was minimum if notch was located in the middle of the beam. The commercial software Abaqus is used for getting natural frequencies.

Keywords: Natural frequency, Three-point bend notched specimen, and Abaqus 6.12.

ICARI-ME-20-01-85

Analyzation of the Brake master cylinder for Vehicle

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Abstract: The braking machine which goes with the help of hydraulic ideas is known as hydraulic braking system Our work is focused on reducing weight which is one of the factors to increase the efficiency. Reduction in weight and space, due to its compactness. The twin Master cylinder system is a great advancement in braking system for an ATV. 3-D CAD modeling is done using SOLIDWORKS, whereas the analysis of its strength is done using ANS YS. The maximum frequently used device operates hydraulically, with the aid of strain applied through a liquid. These are the foot operated brakes that the motive force usually makes use of to sluggish or forestall the car. Our unique interest in hydraulics is related

to the actions in automobile structures that end result from strain implemented to a liquid. This is known as hydraulic stress. Since liquid is not compressible, it can transmit motion. A typical braking system includes two basic parts. These are the master cylinder with brake pedal and the wheel brake mechanism. The other parts are the connecting tubing, or brake lines, and the supporting arrangements. The present paper is about designing of Twin master cylinder system for and all-terrain vehicle and doing feasibility study of its strength using ANSYS.

Keywords: Hydraulic system, brake, master cylinder, analysis, design, twin master cylinder

ICARI-ME-20-01-86

Role of Data Analytics in Manufacturing Industry

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Abstract: The ubiquity of smartphones and apps is drastically changing the customer experience and expectations, allowing individuals to participate in various stages of the production process. It makes manufacturing industry to change its production strategies to mass customization. This paper focusses on the role of Data analytics in manufacturing industry. Data Analytics finds an important role especially in the field of new product development by involving customers in manufacturing process with the help of combination of digital manufacturing, mobile and augmented reality technologies that allow customers to provide feedback in a co-creation process, minimizing idleness of production systems by integrating it with customers and suppliers, planning for predictive maintenance, optimizing supply chain, demand forecasting, inventory management etc.

Keywords: Data Analytics, Machine learning, IoT, Cyber Physical System, Mass Customization

ICARI-ME-20-01-87

Analysis of the public perception of Electrical vehicles in Delhi-NCR Region using Delphi-AHP technique

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Abstract: Delhi-NCR is facing the worst pollution scenario and traffic congestion these days. Electrical Vehicles (EVs) will be helpful in reducing pollution level especially Green House Gases (GHG's) and particulate matters (PM2.5 & PM10). In addition to the pollution, emission control norms (BS-VI) and awareness of climate change & global working are the major factors of people's attraction to EVs. State and central government are also initiating several policies in India for the adoption of EVs like a subsidy, lower GST rates etc. In this paper, the public's perception of EVs is analyzed on the basis of a survey made in the Delhi-NCR region. Delphi technique is employed to select major factors for the estimation of respondents' purchasing intention of EVs

and Analytical Hierarchical Process (AHP) is used to prioritize these factors for the adoption of EV's over conventional vehicles (CV). The resale value of EV is an important consideration for the majority of respondents. This research focuses on analyzing the increase in demand for replacement of old conventional (petrol/ diesel engine) vehicles with Electrical Vehicles (EV's) on the basis of public perception towards EVs and alternatives available in the market. Finally, several recommendations are made to facilitate the EVs' deployment in India.

Keywords: Electrical Vehicles (EVs), Delphi method, Analytical Hierarchical Process (AHP)

ICARI-ME-20-01-88

Review of effect of Fiber length on the mechanical properties of Biocomposites

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Abstract: Biocomposites are the torch-bearers for the 'environmentally sustainable manufacturing' in current times. Also, their growing demand to meet the industrial application is also gathering momentum. Different manufacturing parameters are responsible for making biocomposites capable of matching the standards set by the convention petroleum origin products. In this paper, fiber lengths of three natural fibers used in the biocomposites are studied and their effects on the mechanical properties of the biocomposites are recorded. This paper helps to formulate a review of different natural fibers used and the influence fiber lengths on natural fibres exert on the mechanical properties of biocomposites such as tensile modulus, flexural modulus, flexural strength, fracture resistance and impact strength.

Keywords: Biocomposites, flexural modulus, flexural strength, fracture resistance and impact strength.

ICARI-ME-20-01-89

Evaluation of the effect of micro bubble lubrication in drag reduction

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Abstract: This paper aims to study the reduction of skin friction coefficient (C_f) of a flat plate by injecting microbubbles onto the surface of the plate. Numerical simulation of flow of water past a flat plate was carried out at different Reynolds numbers. Skin friction coefficient (C_f) was found and compared with research papers and suitable empirical formula. The numerical solution was solved in ANSYS. Subsequently, micro bubbles were injected and the new C_f found. The velocity of injection of the bubbles was then varied. Drag reduction was observed for flat plate post microbubble injection and injection velocity was varied, corresponding results were noted. The results agree well. This paper verifies effect of microbubble injection in skin friction drag reduction computationally.

Keywords: Microbubble, Skin friction coefficient, Drag Reduction

Motivation of Women entrepreneurs and their challenges

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Abstract: In the traditional Indian society where once women were confined to four walls is now participating in all types of activities including entrepreneurship. In India, empowering women has become an important part of development efforts aiming at women development, economic growth and social stability of the society. The focus of this paper is on motivation behind women participating in entrepreneurial ventures and the problems faced by them in their efforts.

In this study we will understand the role of women entrepreneurs and also about the different marketing related issues and challenges faced by them.

Keywords: entrepreneurship, women development, motivation, challenges, marketing strategies

Digital Financial Inclusion: New opportunities and New Challenges

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Abstract: Finance has become an integral part for the development of any economy. For this reason a strong financial system is required not only for developing and under developed economies but also for a developed country. Globally, financial inclusion is not only considered as a critical indicator for the development and well-being of society but is also a key enabler of the UN Sustainable Development Goals. Financial inclusion helps a nation to achieve an equitable and inclusive growth. Over the past few years the efforts undertaken by the GOI and Reserve bank of India to integrate the unbanked into the formal financial network have yielded mixed results. With the demonetization wave the focus is now shifted towards digital financial services. Through this paper the researcher attempts to examine the growing significance of digital based financial services and how their use can contribute towards the achievement of SDG's and also to highlight the risk and rewards associated with the digitalization of financial services.

Keywords: Financial Inclusion, Digitalization, Sustainable Development Goals.

Pathology of Schizophrenia

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Abstract: Often mistaken as ‘paranormal’ some mental disorders can indeed be intimidating. People claiming that they hear voices or that they could see people who other people don’t could actually point towards a very strange mental condition called ‘schizophrenia’. People suffering from the disease show a broad range of symptoms that makes it difficult to get diagnosed. The exact causes of the disease could not be known but it is believed to be a result of the combined effect of many factors that include environmental conditions and genetics. This paper covers the symptoms, causes, and treatment of the disease and portrays its history and steady evolution.

Keywords: Schizophrenia; Hallucination; Delusions; Dopamine; Antipsychotic, etc.

ICARI-EC-20-01-04

Micro strip patch antenna for WLAN/WiMAX applications: A Review

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Abstract: The increasing demand for good wireless antennas in the field of wireless communication leads to the advancement in the design and development of compact microstrip patch antenna. This paper reviews the development of multiband microstrip antennas for WiMAX and WLAN applications in recent decades. Multiple advancements have been done till date in the field that includes different sizes of patches, ground plane, multiple sizes of slots (L-shaped, Rectangular, Circular shaped) have also been used to get required multiband frequencies. Dual-Band Monopole Patch Antenna Using Microstrip Fed technique was considered due to its satisfactory frequency bands with a very compact size-Slotted Microstrip Fed Monopole Antenna for Triple Band was implemented for improvement in radiation efficiency, Compact CPW-fed tri-band printed antenna with meandering split-ring slot that was considered for multiband applications , ,Miniaturized printed K shaped monopole antenna with truncated ground plane design was another technique considered for improved radiation efficiency and simple design ,Dual Band Monopole Antenna for Wlan 2.4/5.2/5.8 with Truncated Ground was considered for an accurate omnidirectional radiation pattern and comparatively high radiation efficiency, Miniaturized Pi (II) - Slit monopole antenna for 2.4/5.2/5.8 applications was then studied for its simple and compact design. Frequencies. All these design approaches will be reviewed and discussed in this paper.

Keywords: Antenna, communication, WiMAX, WLAN, microstrip.

ICARI-EC-20-01-05

Health Monitoring System using IoT: A Review

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Abstract: In current phase of technology human just become working machine which just working like a robot 24 hours on daily basis to get two times meals. In this race he just forget to focus on very important

part i.e. health. As initially there are so many systems developed, with proper review of these systems we came to know about certain shortcomings and features of previous work done. These systems works on the latest trending tech i.e. IoT (Internet of Things). Thus, IoT brings out its one of the most important application i.e. Health monitoring system. In these systems, generally persons have used Heart Beat sensor, ECG and Blood Pressure sensors with different microcontrollers to take data from the sensors and send it to the local server with which data can be shared with Doctor as well as with the patient in the android application which can aware the user regarding its latest reading.

Keywords: Iot, health, heartbeat, blood pressure.

ICARI-EC-20-01-06

Waste seggration and waste management in Meerut

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Abstract: Nowadays certain actions are taken to improve the level of cleanliness in the country. People are getting more active in doing all the things possible to clean their surroundings. Various movements are also started by the government to increase cleanliness. We will try to build a system which will notify the corporations to empty the bin on time. In this system, we will put a sensor on top of the garbage bin which will detect the total level of garbage inside it according to the total size of the bin. When the garbage will reach the maximum level, a notification will be sent to the corporation's office, than the employees can take further actions to empty the bin. This system will help in cleaning the city in a better way. By using this system people do not have to check all the systems manually but they will get a notification when the bin will get filled.

Keywords: Health care, IOT, cleanliness, city.

ICARI-EC-20-01-07

To Improve Efficiency of Garbage Collection System for Smart Cities

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Abstract: As nowadays population is increasing tremendously, we are facing a lot issues due to that, pollution is one of the, and also government have launched many schemes for make our society clean and healthy , we here focused on a related issue which cause pollution and also cause many diseases, government installed dustbins in almost every area of many cities to make a city clean and healthy but that doesn't seems to successful problem is not resolved , as when the dustbin is filled there is no one to make it empty not even municipal corporation aware bout that and dustbin is overflowed and cause diseases, so

we are planned to transform a normal bin into smart bins, with the help microcontroller Arduino UNO, Ultrasonic sensor, servo motor IR sensor and a GSM module. Ultrasonic sensor is placed at the top of the dustbin which will measure the stature of the dustbin. The threshold stature is set as 10cm. Arduino will be programmed in such a way that when the dustbin is being filled with help of Arduino and GSM module a message is sent to the nearest swipe to that dustbin. Once the dustbin is squashed, people can reuse the dustbin. At regular intervals dustbin will be squashed. Once these smart bins are implemented on a large scale, by replacing our traditional bins present today, waste can be managed efficiently as it avoids unnecessary lumping of wastes on roadside. Foul smell from these rotten wastes that remain untreated for a long time, due to negligence of authorities and carelessness of public may lead to long term problems.

Keywords: Arduino, Ultrasonic Sensor, GSM module, Smart Dustbin.

ICARI-AS-20-01-10

A Case Study of Transformations brought by Vaidyanathan Committee Recommendations in Pathargama Primary Agriculture Credit Co – Operative Society

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Abstract: The present study is related with the impact analysis of Pathargama PACS in Godda district of Jharkhand. The PACS under study has 1812 members out of which 12 persons are in the Board of Directors of the society include 5 women and 1 ST members.

The Vaidyanathan study team provides financial as well as non-financial assistance to only eligible Societies. Eligibility criteria comprise improvement in management and record keeping, efforts taken to improve recovery performance and aiming at enhance overall efficiency.

The concerned committee fulfils the criteria. Hence it was provided assistance of Rs 232000 from the DCCBs Godda which was given fund by NABARD through the Government of Jharkhand. The fund obtained was utilized by the society for legislative reforms brought about in the Bye-Laws by the state government. It provided reduction in government intervention such as voting right to members, limiting supervisory power of the Government and increase in composition of its functions.

The Society adhered to the programme of providing and attending training courses organized by the BIRD, DLTs and CAS. The Vaidyanathan committee also effected technological reforms and attempted to provide Internet facility to the society. In this attempt the society has not been successful till date. Attempts have been taken to improve recovery performance regularity in holding meetings, According larger membership to weaker sections of the society and enlargement of financial capacity and its functioning in addition to credit activities.

Key words: Transparency, Criteria, Agriculture, Mechanism

An Exploration of Social Marginality in Arundhati Roy's fiction: The Ministry of Utmost Happiness

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Abstract: Marginalization is a process of exclusion of the socio-culturally, economically, politically and religiously deprived group. It is a discriminatory behavior towards the minorities and powerless segments of the society by the majorities or powerful segments. Dalit's, outcasts, tribal, Muslims, transgender, destitute and females are commonly observed as marginal or peripheral and they are susceptible to exploitation. Intend of this paper is to portray the plight of marginal people in caste ridden nation and the violence permeated into their life. Arundhati Roy is an internationally celebrated writer activist— a voice for the marginalized, the rejected, the outcastes and the suppressed. She explores the subjects of human pain and very audaciously depicted the caste and gender marginalization in her novel The Ministry of Utmost Happiness. Her fictions are a registered account of violence on the marginal. The novel reveal the upliftment of Hindutva and their carnages on the non- Hindus.

The present paper investigates that how the untouchables and women in India are disgraced, exploited and marginalized on the basis of falsehood of societal rules of racism, casteism and male chauvinism. In order to survive, the ostracised sections create their own sub-culture but their efforts have not been acknowledged and established by those from the so-called governing mainstream culture. The yelp for independence and emancipation by the marginalized sections can be realized in the novel. Being socially committed, Roy's aim is to scratch the readers' conscience and enflame them to contemplate on nation's social evils and discrimination so that it may lead to amelioration of the society. The paper will enable the readers to perceive the intention of the fictionist in eliminating the social evil and upholding the respect to mutual human values required to improve the living standards.

Key Words: Marginalization, Destitute, racism, carnages, ostracized, amelioration

Review on Sustainable Development of Solar Energy

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Abstract: The world is becoming a global village as the requirement of energy is increasing day by day due to the increasing population around the world. Therefore, the need for development of energy is increasing as earth has limited resources of energy, thus need for renewable sources of energy is rising. Solar energy is a good renewable source for generation of energy as well as they are sustainable to meet future demands of the generations. The Renewable Solar energy sources mitigate climate change, reduce emissions and provide clean energy with a clean Environment for future. This paper gives an insight to the sustainable development of the solar energy.

Keywords: Sustainable development, sustainability, solar panels, Renewable, solar energy

Analysis of Electric Vehicle impacts on metro cities in India: Developing a regional optimization model

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Abstract: The life cycle of electric vehicles (EVs) and its environmental impact are very important for making political decisions to switch over to EVs in a region. Efforts are being made to optimize these factors for better transport movement in different regions of India by the year 2030. In this paper, assessment of life cycle and environmental impact of Gasoline-powered hybrid electric vehicles and three variants of electric vehicles (gas-powered hybrid electric vehicles, long-haul electric vehicles, and electric vehicles) is done for a specified region and cost associated to environmental damage, the water footprint for each case is also estimated. The cost of related to the life cycle, environmental damage and water footprint of the vehicle type is modeled for different regions of the Indian power grid using an exploration and analysis modeling method to find an ideal combination of different types of vehicles in each region of India. This study may be helpful for transport decision-makers and planners to prepare the transport system in the future.

Keywords: Electric Vehicles (EVs), Environmental impact, water footprints.

Devising a Method for Force Estimation and Analysis of Front A-Arms of A FSAE Vehicle

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Abstract: The suspension links of a vehicle transmits all the load developed between the tire contact patch and the ground during maneuvers to the chassis through its members. The purpose of this paper is to devise a methodology to calculate and estimate the load developed on the various links of the front suspension of a Formula Student (FSAE) car. The forces developed at the tire contact patch is transferred to the wheel hub and then the various loads are calculated in each link assuming it as a 3-D truss. These individual links are then analyzed using analysis software (SolidWorks) for further changes required in the dimensions. The a-arms thus created with the links is then again analysed using the same software. The analysis suggested that the hand calculation can provide the load values which reduces the iteration process quite significantly.

Key words: Analysis of A-arms, Front suspension, contact patch, 3-D truss

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Optimization of Electro-Discharge Diamond Drilling of Inconel 718 using Taguchi Method

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Abstract: In this paper Taguchi method has been applied for optimization of electric discharge diamond drilling of Inconel 718 super alloy. Electrical discharge diamond drilling (hybrid process) process has been carried out on Inconel 718 using Taguchi L9 orthogonal array (OA). The effects of process parameters such as peak current (I), pulse-on time (Ton), pulse-off time (Toff) and drill speed (DS) on average surface roughness (ASR) have been studied to optimize and improve the process capabilities. Taguchi's orthogonal array L9 (3^4) with three level of each four control factor were peak current, pulse-on-time, pulse-off-time and the rotational speed of tool electrode has been used in this study. In this study, the effect of varying process parameter with fixed machining time and constant spark voltage been investigated on average surface roughness of Inconel718. Pulse-on time and peak current found the most influencing parameters for average surface roughness during electric discharge diamond drilling of Inconel718. The optimum value of average surface roughness was found 1.88 μm . The percentage error between experimental and predicted values of average surface roughness was found 6.844%.

Key words – Taguchi method, ASR, ANOVA, OA, Inconel718, Electric discharge diamond drilling.



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The flagship Institute of the group, Meerut Institute of Engineering & Technology (MIET), has officially been ranked as the 4th best Engineering College in Uttar Pradesh by AKTU, Lucknow. Renowned academic environment, extensive alumni network in over 200 companies, excellent placements, interface with industry and numerous extra-curricular activities make MIET a great educational institution. MIET stands tallest among all other self-financed engineering institutions in northern India. It not only holds the prestigious position of being one of the best & oldest (Established in 1997) Institutions that caters to education in the field of Engineering and Technology but also ensures that each student emerges out competent enough to hold a dynamic image of his own after the completion of his or her stint at MIET.

Under the tutelage of the best known faculty, MIET has earned the reputation of being one of the most preferred institutes by the students and parents all these years. Known for its excellent infrastructure, facilities for learning, unique academic environment & innovative teaching methodology, each student is initiated towards overall excellence to empower the youth who aspire to become successful Engineers, Scientists and Managers.

MIET is dynamically growing Institute in the state of Uttar Pradesh, managed and governed under the auspicious and noble organization, “City Educational & Social Welfare Society, Meerut, Uttar Pradesh”. The City Educational & Social Welfare Society was founded by Late Sri Chandra Sen Agarwal in the year 1989, who first established a vocational training school (10 + 2) realizing the growing need for education for the young generation in this region of Uttar Pradesh. The society was the result of initiatives taken by Late Shri Chandra Sen Agarwal, a great educationist, who had spent all his life towards the cause of education. The last assignment held by him was as Secretary of “UP Board of High School and Intermediate”. Like minded philanthropists of this region joined hands with him and took upon social causes, and established vocational schools to train the technical man power. He was far-sighted and could foresee the need of young men and women to be trained for the industrialized India under the shadows of Globalization of trade and established Meerut Institute of Engineering & Technology at Meerut in the year 1997. This institute, today, is a leading Institute known for placement and academic excellence and is also a preferred destination for technical education of the region. Presently, MIET is flourishing under the leadership of Shri Vishnu Saran, a great visionary, who is carrying on the dream philanthropic project nurtured by his father, the Founder-Chairman of MIET Group Late Sri CS Agarwal. He strongly believes and follows the four golden principles for success laid by the honourable Late Smt. Indira Gandhi ji – Foresight, Hard Work, Determination and Discipline.

The promoters of the society are having good resources, good social status and goodwill in the city and nearby area. Promoters of the Society are very well conversant with the requirements of an educational organization and their associates are having expertise in the management of the Schools. The promoters are committed to the quality education and academic excellence. The Institutes (run by the society) are running different technical courses such as MBA, PGDM, MCA, M.Tech. in Biotechnology, Computer Science & Engg and Digital Communications, M. Pharm. In Pharmaceutical Chemistry, Pharmaceutics and Pharmacology, B. Tech. in Biotechnology, Chemical Engg., Computer Science & Engg., Civil Engg., Electronics & Communication Engg., Electronics & Instrumentation Engg., Electrical Engineering, Information Technology, Mechanical Engg., and B. Pharm.

Vision

To be an outstanding institution in the country imparting technical education, providing need-based, value-based and career-based programmes and producing self-reliant, self-sufficient technocrats capable of meeting new challenges.

Mission

The mission of the institute is to educate young aspirants in various technical fields to fulfill global requirement of human resources by providing sustainable quality education, training and invigorating environment besides molding them into skilled competent and socially responsible citizens who will lead the building of a powerful nation.

Objectives

The objective of the institute is to have necessary instruments and resources to deliver technical manpower that not only meets the local industry requirements but is also an acceptable human resource for the global job market in Management & Technology as well as Master in Computer Application and other technological sectors. We aim to provide quality technical education facilities to every student admitted to the institute along with the development of all round personality of the students. To be a technically high and professional institute, we ensure to provide most competent staff and excellent support facilities like well-equipped library, lecture theaters, computer and scientific laboratories fitted with high quality equipment. The institute organizes in-house and outside training programmes, seminars, conferences and workshops on continuous basis and encourages participation of staff and students to improve its Academic Pedagogy through innovative ideas and techniques in order to impart quality education. To fill the perception gap between expectation of industry and preferences of academia through industry institute cell, we organize interactive sessions in the campus. To produce competitive professionals for meeting the upcoming demand of the nation, the institute will always remain dedicated to the social causes of the public of this region.

Approval & Affiliation

Meerut Institute of Engineering and Technology (MIET) has been approved by All India Council of Technical Education (AICTE), New Delhi, Govt. of India, and the Govt. of Uttar Pradesh since 1997.

About AICTE, New Delhi

The statutory All India Council for Technical Education was established for proper planning and coordinated development of technical education system throughout the nation for qualitative improvement of such education in relation to planned quantitative growth and the regulation and proper maintenance of norms and standards in the technical education system and for matters connected therewith. To improve upon the present technical education system, the AICTE believes one major step would be to modify the engineering curriculum with the following main objectives:

To ensure that the design-oriented teaching is given more importance in the institutes to give a practical angle to the study. Problem solving is also given a high priority to ensure that the student learns more from practice than theory.

To ensure that the students are given more exposure to the industrial and manufacturing process to make them more technical and successful as professionals.

To ensure that the courses in the technical colleges include new technology in the syllabus. It also checks that the old technologies and theories are removed from the courses to ensure that the students are at par with the latest technology.

To make the students all set for the professional world.

OR

Greater emphasis on design-oriented teaching;

Teaching of design methodologies problem-solving approach;

Greater exposure to industrial and manufacturing processes;

Exclusion of outmoded technologies and inclusion of the new appropriate and emerging technologies;

Great input of management education and professional communication skills.

Here is the latest copy of Approval Letter: **Approval Letter**

For official website of AICTE, please visit: **<http://www.aicte-india.org>**

AKTU Affiliation

Meerut Institute of Engineering and Technology (MIET) is affiliated to the state university since 1997. Its courses are affiliated to Dr. APJ Abdul Kalam University- AKTU (formerly Uttar Pradesh Technical University), Lucknow. The Institute follows the syllabus and course structure

constituted by the AKTU. The University conducts all end term examinations and also awards degrees to successful candidates.

About AKTU, Lucknow

Uttar Pradesh Technical University (now AKTU) was established by the Government of Uttar Pradesh on 8th May, 2000 vide Act No. 1248(2)XVII-V-I-I-19-2000 Uttar Pradesh Adhiniyam Sankhya 23 of 2000. Under the University Act, 'Technical Education' includes programmes of education, research and training in Engineering, Technology, Architecture, Town Planning, Pharmacy, Applied Arts & Crafts and such other programmes and areas that the Central Government may in consultation with All India Council for Technical Education (AICTE) by notification in Gazette declare.

The University is affiliating in nature and its jurisdiction spans the entire state of UP in affiliating B.Tech, MBA, MCA, B.Arch, B.Pharma, BHMCT, M.Tech and Ph.D. programmes in 238 colleges/institutions imparting graduate, postgraduate and doctoral level training in all government and private institutions located all over UP in engineering, technology, architecture, pharmacy, hotel management and catering technology as well as MBA and MCA programmes.

Uttar Pradesh being the largest state of India with an area of around two lakhs forty thousand square kilometers and a population of more than 165 million people makes AKTU as one of the largest technical universities not only in India but perhaps in Asia. Because of its gigantic size and number of colleges affiliated to it and geographic dispersion, it has been sub-divided into five zones with 45-50 colleges in each zone for the ease of management and facilitating inter-zonal comparison and possible internal competition to enhance quality of teaching-learning processes.



