

6th International Conference of Advance Research and Innovation (ICARI-2019)

Call for papers

Aim

International Conference of Advance Research and Innovation (ICARI-2019) 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 ideas in recent advances in 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).

Mechanical engineering, energy engineering (renewable and non-renewable energy), industrial engineering, production engineering, automotive engineering, marine engineering, automation engineering, applied sciences, architecture and building materials, bio-mechanical technology, chemical and material engineering, bio-medical engineering, fluid mechanics, thermal engineering, environmental and civil engineering, computer science & software, electrical system, instrumentation and electronics engineering, mechatronics, information technology, electronics and communication technology, metallurgical science, economic policies and issues, total quality management, optimization techniques, management, Agriculture science, Biological Science, Arts and Humanities, Biochemistry, Genetics and Molecular Science, Business, Management and Accounting, Chemical Engineering, Chemistry, Computer Science, Decision Science, Earth and Planetary Science, Economics, Econometrics and Finance, Energy, Engineering (All branches), Food Science and Technology, Environmental Science, Health Professional, Immunology and Microbiology, Material Science, Mathematics, Medicines, Nursing, Pharmacology, toxicology and Pharmaceuticals, Physics, Social Science, Veterinary Science, etc.

Submissions

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

bhupendralpu@gmail.com

All Papers will be published by www.ijari.org

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 non-refundable.

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

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Foreign Students	US\$ 70

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At the ICARI-2019 you will meet with representative from industry, leading scientists, research professors, research scholars from all walks of science and technologies.

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Show Hours: 20th January 2019, 9:00AM-5.00PM

Venue: Delhi State Centre, Institution of Engineers (India), (Engineers Bhawan), 2, Bahadur Shah Zafar Marg, New Delhi-110002, India

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ICARI 2019 will be held at Institution of Engineers (India), Delhi State Centre (Engineers Bhawan), 2 BS Zafar Marg, New Delhi-110002. It is situated in central Delhi. This is 4 km away from New Delhi railway station, 25 km Airport. More detail available on Google map 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. Direct at Gate No 6, ITO Metro Station, Violet Line.

Message from Editor Desk

Dear Colleagues

International Conference of Advance Research and Innovation (ICARI-2019) is the 6th International Conference Organized by International Journal of Advance Research and Innovation (www.ijari.org) on **20th January 2019** (Sunday). It gives us immense pleasure that ICARI-2019 has been graced with the presence of **Dr. Rambir Singh G**, Head of Scientific Division (SEED), Department of Science and Technology (Delhi-16), Government of India. He has encouraged, motivated and energized involving current trends of research projects with great enthusiasm. ICARI -2019 team thanks for his valuable academic and research support.

ICARI-2019 has received an overwhelming and enthusiastic response from students, researchers and faculty and experts from reputed organizations and industries for sharing the pearls of their skill, experience, knowledge and wisdom. Papers from more than seven countries have been received and the book of Abstract with ISBN are prepared and distributed as conference proceedings. Papers from respective authors have been presented in .ppt form, from India and abroad.

ICARI-2019 is highly thankful to **Dr. Rambir Singh (DST, Govt. of India)** for inaugurating as a Chief Guest and enlightening the new research and development facts of India. **Dr. Amitanshu Pattnaik(Scientist, DTRL-DRDO),Dr. Rajeev Sharma (Scientist E, DST), Dr. AK Mandal (HoD Pathology/Director Baba Sahib Ambedkar Hospital, Rohini, Delhi), Dr. RK Pandey (Professor, IIT Delhi), Dr. Atul Kumar (HoD- TERI), Prof. HC Lim (Professor, PNU, South Korea), Dr. RS Mishra, Dr. Ranganath MS and Mr. DN Pal(Associate Vice President at PL Engineering Ltd)** are the **Key note Speakers and Guest of Honors** who graced the occasion and shared their experience, skill and knowledge from different field and areas. We are honored to have them as our distinguished participants.

Faculties from Delhi Technological University (DTU), Delhi like Dr. A Mandal, Scientist C-UGC, Dr. Amit Pal, Dr. RC Singh, Dr. Rajeev Chaudhary, Dr. Nand Kumar, Dr. Girish Kumar, Dr. Archana Singh, Ms Parinita Sinha, Prof. Kongan Aryan, Dr. Vikas Gupta, RL Meena, Roop Lal, NA Ansari, Dr. Pravin Kumar etc. and students of DTU add the value in the successful completion of the event. Researchers, academicians, Scientists, Engineers, Technocrats from premier institutes and universities are gathered on this grand event to exchange ideas and innovations from all corners of India and abroad.

We believe that ICARI-2019 will prove to be very beneficial, enriching and fruitful and will also open new fronts and vista for future research and innovation.

Team ICARI

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Cogency of the Elementary Corrosive Composites in Crude Oils

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Abstract: Crude oils are naturally occurring compounds that mostly composed with hydrocarbons and some specific trace composites such as corrosive composites. Investigations of the impact of sulfur, organic acids and salts of Murban and Das Blend crude oils on the corrosion rates of seven different types of ferrous metals which are applicable in the crude oil refining industry were the intentions of the research. The chemical compositions of seven types of ferrous metals, elemental sulfur, mercaptans, organic acids and salt contents of both crude oils were tested and collated by in order of XRF detector, XRF analyzer, titration methods and salt analyzer. The corrosion rates of a set of similar sized metals coupons from seven types of metals were tested in order of 15, 30 and 45 days immersion time period with respect to both crude oils were determined by the weight loss method while observing the corroded metal surfaces through the 400X lens of an optical microscope. In addition the decayed ferrous and copper concentrations from metals into crude oils and the reductions of the initial hardness of metal coupons were tested by in order of atomic absorption spectroscopy (AAS) and the Vicker's hardness tester. According to the obtained results there were found some lower corrosion rates from stainless steels with respect to both crude oils which are having at least 12% of chromium and sufficient amount of nickel, higher amounts of elemental sulfur, organic acids, mercaptans and lower amount of salts in Das Blend than Murban, higher impact of salts on the metallic corrosion when comparing with other corrosive composites, significant decay of ferrous and copper from some metals into crude oils, formation of FeS, Fe₂O₃, corrosion cracks and cavities on the metal surfaces and slight reductions of the initial hardness of metal coupons during the process of corrosion.

Keywords: Crude oils, Corrosive composites, Ferrous metals, Weight loss, Decay etc.

Acoustic properties of light concrete of natural pozzolans of Ambohinaorina

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Abstract: Pedological study is essential because it contributes to improve our knowledge on materials used to construct buildings of which lifetime is in compliance with the norms in force. Our study is based on the acoustic properties of the pozzolan concrete of the Ambohinaorina (Vakinankaratra region- Madagascar). The numerous experimental results obtained in this article demonstrate that pozzolan can be used to produce lightweight concrete in taking into account the volumetric composition of aggregates (cement included) which has to be optimum.

Influence of abattoir wastes on soil microbial and physicochemical properties

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Abstract: Influence of abattoir wastes on physicochemical and microbiological properties of soil samples obtained from Akwa Ibom State, Southern Nigeria were investigated using standard analytical and microbiological methods. Studied abattoirs and the control soils were in the sandy-clay-loamy soil category with varied quantities of sand, silt and clay. Bulk density, pH, electrical conductivities, salinity, moisture content, total organic and carbon content, cation exchange capacities, total petroleum hydrocarbon, nitrogen and phosphorus contents of studied abattoir soils were higher than in control. Essential elements (K, Na, Ca, and Mg) and trace metals (Fe, Zn, Cd, Cu, Pb, Cr and Ni) levels were also higher in abattoir soils than in control though were within permissible limit in soil except for Fe. Metal pollution index (MPI), enrichment factor (EF), geo-accumulation index (Igeo), degree of contamination (Cdeg) and pollution load index (PLI) of trace metals have also been calculated using existing pollution models. Microbial studies revealed total heterotrophic bacteria ranged from 6.41 ± 0.43 to 7.91 ± 0.58 \log_{10} CFU/g while fungal count ranged from 4.94 ± 0.26 to 5.79 ± 0.34 \log_{10} CFU/g. Among the four (4) locations, IK2 had the highest heterotrophic bacterial densities of 7.91 ± 0.58 \log_{10} CFU/g while IK1 had the highest fungal count of 5.79 ± 0.34 \log_{10} CFU/g. A total of six (6) bacteria (*Klebsiella*, *Micrococcus*, *Pseudomonas*, *Bacillus*, *Escherichia* and *Enterobacter*) and two (2) fungi (*Aspergillus* and *Penicillium*) species were isolated. The study revealed a significant ($p=0.05$) increase in the number and varieties of microorganisms most of which may be pathogenic but are more often than not indicators of recent faecal pollution in the soil impacted with the abattoir wastes.

Keywords: Abattoir waste, soil microbials, physicochemical properties etc.

A Taguchi Approach on Optimal Process Control Parameters for PVC Pipe Extrusion Process

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Abstract: In this study, the Taguchi method is used to find the optimal process parameters for process of producing PVC pipes by the technological extrusion process. An orthogonal array (OA), main effect, signal-to-noise (S/N) ratio, and analysis of variance (ANOVA) were used to investigate the pipe ring flexibility. The process parameters, namely speed traction lines, nozzle temperature, doser expander, screws speed extruder, screws speed co-extruder, barrel temperature, dozer mixture of extruder, and doser mixture of coextrudes are optimized with considerations of the performance characteristics flexible pipe ring. Through this study, not only can the optimal process parameters for extrusion process be obtained, but also the main process parameters that affect the bending performance of the pipe ring flexibility. Experimental results are provided to confirm the effectiveness of this approach.

Keywords: Extrusion process, Optimization, Taguchi Method, Orthogonal array, Signal to noise ratio

ICARI-AS-19-01-05

Effect of Cognitive Style on Students Achievement and Retention in Physics in Senior Secondary School in Gwer-West Local Government Area, Benue State, Nigeria

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Abstract: This study was undertaken to determine the effect of cognitive styles on students' achievement and retention in physics in senior secondary schools in Gwer-west local government area of Benue state. The study therefore looked at the achievement and retention of male and female students categorized under field independent and field dependent students in physics. Three research questions and three research hypotheses were set to obtain data for effective study. The study adopted the ex-post facto research design. The population of the study comprises 1015 SS1 physics students of 2016/2017 academic year in the twenty-nine co-educational schools of Gwer-west local government area of Benue state. The sample of the study was 150 physics students selected from five secondary schools out of 29 schools through judgmental sampling technique. The instruments for data collection were Group Embedded Figure Test (GEFT), Physics Achievement Test (PAT) and Physics Retention Test (PRT). Data collected was analyzed using descriptive analysis under parametric analysis to determine the mean and standard deviation. While the hypotheses were analyzed using statistical analysis of covariance (ANCOVA). The results of the findings therefore revealed that field independent students achieved better than the field dependent students in physics. It also showed that field independent students had a higher retention memory than field dependent students. Furthermore, it revealed that male students achieved better than female students under field dependent in physics. The analysis further explained that there was a significant difference in the entire three null hypotheses. Finally, summary, conclusion, recommendations were made and suggestions for the extension of the research to other levels of education were made.

Keywords: Cognitive styles, Achievement, Retention, Physics

ICARI-AS-19-01-06

Managing Students' Attitude towards Physics through Problem Solving Instructional Strategy: A Study Carried Out in Senior Secondary Schools in Makurdi Metropolis

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Abstract: The study was designed to further clarify the claims by several authors that methods of instruction could change students' attitude towards physics. It was the belief of the author that if students were allowed to develop higher cognitive processes through problem-solving instructional strategy, their attitude towards physics might change. The topic of the study is managing students' attitude towards physics through problem-solving instructional strategy. The area of the study is all senior secondary schools in Makurdi metropolis of Benue State. 210 students were randomly selected from six (6) secondary schools in Makurdi for the study. A quasi-experimental research design was used for the study. Problem-solving strategies were used with the experimental group, while the control group was instructed using traditional teaching methods. The data collected was analyzed using frequency, simple percentage, mean, standard deviation and ANOVA while t-test was used to test the research hypotheses at 0.05 alpha level. The findings indicated that students in the experimental group made more positive improvement in attitude towards physics than the control group, those in the PST group showed more positive attitude towards the learning of physics followed by

those in the SLT group and a poor attitude scale was observed in the control group.If problem-solving instructional strategy could draw many students to offering of physics in secondary schools in Makurdi

metropolis, it would be necessary for physics teachers to adopt this method so as to solve the problem of many students withdrawing from physics course at the secondary school level. This method can also be adopted and be more efficient in other country especially those having the same educational system like Nigeria.

Keywords: Manage, Physics, Attitude, Strategy, and Problem-Solving.

ICARI-AS-19-01-07

Inclusive development through cooperative society, special reference to Godda district of Jharkhand

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Abstract: Today every nation of the world is constantly trying to accelerate inclusive development. The main objective of capitalist and socialist economies is to make the economy prosperous. Where less developed and developing countries are wanting to get rid of their general poverty, unemployment, economic inequality and backwardness and maximizing the usage of their available resources and increasing product and productivity. The developing countries want to keep their development continuously motivated. Inclusive development is the process under which human beings, by eliminating poverty and economic inequality in the country and making efforts to improve the living standards of citizen by increasing their per capita income by increasing product and productivity in all the areas of economy.

To further enhance this effort, cooperatives have been the oldest and the only agency in raising the farmers and the weaker sections. With the help of the co-operatives dairy, poultry, fishery, sheep keeping, pig rearing, handicraft, handloom, Khadi village industries, Papadum industries, house, consumer, weavers committee and industrial production committees are playing important role in India's inclusive development. The development of the agricultural cooperative credit movement has not been done in the whole country in general. Its regional development appears to be uneven and unplanned. There is state inequality in the production and productivity of cereal crops of agricultural credit co-operative societies in India.

In order to understand these regional and regional disparities, this paper has selected Godda district of tribal and weaker sections of Jharkhand, a small and backward state of India. Jharkhand was partitioned from Bihar on November 15, 2000. It was a subdivision of Santhal Pargana district before it became a district on 25th of May, 1983 from undivided Bihar, in 1855. It is one of the most backward district of Jharkhand. According to the 2011 census, the total population of this district is 13, 13,551 and its area is 2110 square kms. The average tribal population of this district is 22 to 23 %. Their living standards are very low. They benefit very little from governmental facilities and schemes.

The main occupation of the people of this area is farming. Farming is dependent on rain. literacy rate is about 44-45%. the literacy rate is less than 25% of the total SC and ST population which comprises of 30% of the total population of the district and the status of women is also not good. Therefore there is a lack of awareness in this class. Even though being rich in minerals, this district has not been industrialized. As a result, except the Lalmatiya coal fields, workers do not have any other source of employment besides agriculture.

The area being backward by all vision, there is a less ability of branch exploitation. More than half of the weaker sections do not have knowledge about cooperatives. By the government efforts, they are made a member but then also they remain indifferent and sad by the co-operative help and activities. All 9 blocks of the districts has a total of 202 pacs/lamps. Number of total farming families or agriculture based families are 111239. the total number of members is 101227 which is approximately 10% of the total population. Total share capital is 343.09 lacs, in which the members share is 41.53 lacs which is about 12% and that of government share is 301.56 lacs which is 88% of the total capital. The average share of the members is only 40 rupees, which is less than half of the required 100 rupees.

In 2015-16, out of 202 only 37 primary agricultural credit co-operative societies purchased paddy. Out of

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total 1, 01,227 farmer members of the society, only the paddy crop of 4.228 farmers was purchased which is

only 4% of the total members.

In the year 2015-16, a total of 3,945 farmers insured their crop of 808.57 hectare area which increased in the year 2016-17 by 13,261 farmers to 2979.83 hectare area. Government institutions are the basis of rural development. Government institutions provide a strong basis for democracy. The greatest success of the cooperative movement is the development of cooperation spirit which is very much important in the progress of a country.

Keywords: Cooperative Society, development, Government schemes etc.

ICARI-AS-19-01-08

Measuring the Effect of Tariff and Non-Tariff Measures on Trade Growth

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Abstract: Apart from tariff measures i.e. antidumping law, there are various non-tariff measures to protect the importing countries domestic industries. Some are transparent like sanitary and phytosanitary measures (SPS agreement) applied to food safety, animal and plant health regulation. Some are non-transparent like technical barriers to trade (TBT agreement) which apply technical specification on product and has a potential of being misused by importing countries as a barrier to trade. This paper analyses the trend of tariff and non-tariff barriers from the establishment of WTO i.e. 1995 to 2017 to have comparative study between developed and developing country and study the effect of these measures on trade growth.

Keywords: Trade growth, non-tariff, sanitary etc.

ICARI-AS-19-01-09

Multi resolution Analysis of Rainfall Variability Using Discrete Wavelet Transforms

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Abstract: The understanding of the percentage departure in rainfall from average with respect to time is very important for agriculture, environment and economy of any region. The rainfall variability on basis of its average monthly record during the period from Jan. 2013 to Dec. 2017 (05 years) in Moradabad, Uttar Pradesh, India, is discussed. Approximations are low frequency and details are high frequency content of the signal and hence play important role in signal or data analysis. Approximations provide information about the trend of signal. The trend is its slowest part of the signal and represents the behavior of signal corresponding to greatest scale value. A peak in the details shows rapid change or fluctuation in the quantity of rainfall in that time period. Skewness is a measure of symmetry and more precisely, the lack of symmetry while Kurtosis is a measure of whether the data are peak or flatness relative to a normal distribution. There is slight significant decreasing trend for long term northeast monsoon rainfall over Moradabad region.

Key words: Rainfall, Variability, Wavelet, Approximation, Detail etc.

Replenishment Policy for Deteriorating Items Using Preservation Technology

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Abstract: A replenishment policy is proposed for deteriorating items using item preservation cost. The reducing of price strategy may be adopted to retailers on short time span. It may improve the service towards the product and thus in diminishing market retailer could reduce the selling price and generate the excess demand to increase revenue and profit. A numerical example is demonstrated and which showed that in every business setup, there will be an optimal number of price settings obtained for optimal solution. We incorporated the preservation technology cost and our aim is to find the effects of this on optimal policy.

Keywords: Inventory, price sensitive demand, revenue, holding cost etc.

ICARI-AS-19-01-11

Assessing the Financial Literacy Level and its Impact on Investment Decision 'An Empirical Analysis among the Individuals of Indore'

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Abstract: In today's financial world it has been very difficult to live a financially secured life for financially unsophisticated individuals. Due to rapid complexity in the financial markets it is pretty difficult for consumers to manage their money on their own in a precarious environment. Due to present tough market conditions, multifaceted features of financial products, technological up gradation and increase in financial scams and crimes, financial literacy has been as burning issue. Policy makers around the world have recognized financial literacy as an essential life skill. Without having the best level of financial literacy it is rather impossible for an individual to navigate the financial world tactfully. In this paper the researcher took an attempt to assess the level of financial literacy among the individuals of Indore (M.P) by a well drafted questionnaire that includes various questions on basic and advanced financial literacy topics. To examine the impact of financial literacy on investment decision various questions on various regarding investment was asked to the respondents under study. The results of the study found that the individuals possess adequate level of financial literacy, however individuals also lack various concepts regarding basic and advanced financial literacy topics. The results further indicate that various factors influence the investment decision of individuals and the top influencing factors include Family/ Relatives opinion, Friends and Co-workers Recommendations, Condition of Financial Statements, Brokers/ Financial advisors Recommendations and Past performance of firms stock. Finally, the results found that there is a significant positive impact of financial literacy on investment decision of individuals. The research finally ends-up by several suggestions to various stakeholders for improving the level of financial literacy.

Key words: Awareness, Investment, Financial Literacy, Individuals, Financial Wellbeing.

Investigation of Source traits of Personality by Objective Analytic

Tests

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Abstract: A great volume of research on source traits of personality has been published by using questionnaires. Questionnaires though have gain popularity because of ease of their ease in administration; lacks in objective assessment due to several shortcomings like social desirable responses, mental sets, ambiguous responses etc. The paper focus on the use of objective analytic tests described by Cattell in investigation of source traits of personality described by Cattell and Warburton. Objective tests are more universal and economical in approach and are non fakebale miniature kind of situations given to the subject for which he volunteers. The paper describes the utility and application of Objective Analytic Tests in variety of settings such as recruitments of army personnels, selections of people in organizational setups based on their traits for different positions and designations better than the questionnaire measures.

Keywords: Source Traits, Objective Analytic Tests

Embracing Mobile Learning in Education

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Abstract: Mobile learning is a form of learning in which the learner can access the content anytime, anywhere using a mobile device connected to internet. It is evolving fast across the globe due to the proliferation of mobile devices such as smartphones, tablets, iPads, e-readers etc. With increasing exposure to mobile phones, children too have developed an affinity for such devices. These devices can provide an excellent means to engage children through visual and play-way methods of studying. Coupled with traditional methods of teaching, mobile learning can make the process of learning enjoyable for them. This research aims to study the perception and readiness of the students towards adoption of mobile learning solutions for supplemental education.

The paper is a preliminary survey study which seeks to explore students' perception and readiness towards mobile learning for supplemental education. It also studies the future market potential of mobile learning as well as the challenges involved in its adoption using secondary data.

The results of the study show that there is a high level of readiness among majority of the students surveyed to adopt mobile learning as they have access to personal mobile phones and are willing to use mobile phone for learning. A majority of the participants also believe that using a mobile phone to supplement their learning will help them improve their scores in the exams which can be a strong motivating factor in adoption of mobile learning.

There are several challenges which have been identified with respect to adoption of mobile technologies by the students for the purpose of learning using secondary data. These can be used by the researchers and the companies offering mobile learning solutions to come up with improved products and services. The quality of the results is based upon the correctness of the data reported by the participants.

Keywords: E-Learning, M-Learning, Supplemental Education

Challenges of Effective Business Communication

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Abstract: The Communication is the exchange of matter between two persons, while one being sender and the other being receiver. The communication is also important how the sender has expressed the message and how the receiver has comprehended. In field of business also it is important to make communication effective for keeping all employees on the same page, in order to fulfill the organization's objectives. When staff of the company is communicated by the managers, it is communicated so as to underline the ways in which their contributions are essential to the company, which encourage creativity and innovation among staff and increasing collaborative efforts. Effective communication also assists employees in setting and fulfilling goals.

So, there is a great importance of proper and effective communication at all the levels in any business organization. In this respect, it will be very interesting to find out various reasons which may hamper the effectiveness of the communication. There may be many reasons of it like inability of Employer to listen, Ineffective communication, Senior-Junior issues, Lack of face to face communication, cultural heterogeneity, Ego and Attitude related issues, gender related issues etc. All such issues basically may keep workforce teams from operating efficiently or impacting the team as a whole with respect to morale. In this paper a study has been done over such communication issues.

Key words: Communication, Staff, Manager, Effective

Measuring the measures of globalisation: A review

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Abstract: While, Washington Consensus and the New Deal brought globalization to the forefront of economic debate around the world, for India it was the 1991 reforms that familiarized us with this phenomenon. Three decades hence, while researchers have been contesting its negatives and positives, economists have not been able to find a single common definition and point of measurement for globalization. In fact, over the years, economists have alluded to different criterions for measuring globalization and openness, which has created an ambiguity in measuring its effects. As the world disparages this phenomenon, the paper looks at different theories to measure globalization. In doing so, it sheds light on the definition of globalization that best suits this format, as also on the different approaches from growth theory oriented to index oriented approach in measuring globalization. Finally, it presents a cogent analysis looking at theories from Subramanian and Tamisira, Michaely and Yanikayya, and indices like KoF Globalization Index, New Globalization Index, of the measures best suited to compute globalization, also highlighting the approach that would fit the Indian economy.

Keywords : Globalization, Trade-GDP ratios, New Globalization Index, KoF Globalization Index.

Fourth Industrial Revolution and its impact on jobs in developing economies: A review

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Abstract: With capitalist relations set to undergo a major shift with coming of fourth industrial revolution, technology is all set to assume the mantle for social and economic change. Thus, it is important to assay the existing literature on technology to derive a new phenomenon that can best fit the upending that will follow from the new industrial revolution. Although much of this work has been done for the developed world. Studies from Pianta, Vivarelli, Osborne and Frey provide a view for the developed economies, not many studies highlight the havoc it is to wreak for developing countries. While technology may end up creating a similar crisis in the developed and developing world, of joblessness, the effects may vary from one country to another. More important, given the rapid and fast-paced adoption of technology in the developing economies, they won't be far behind in dealing with the effects of rapid robotisation. This paper focuses on the adoption of technology in developing countries, and shed light on the impact of jobs in such economies. In moving the discussion away from productivity and manufacturing, it shows how technology may play a larger role in defining the nature of work in these economies.

Keywords: Job losses, fourth industrial revolution, artificial intelligence, machine learning, 3D printing, automation, computerization, robotics etc.

Acute Toxicity (Lethal Dose 50 Calculation): Medicine as a life saver or destroyer

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Abstract. Lethal dose (LD 50) has been calculated. Different-testing methods have been used. The observed values have been plotted by Dose-Response against measured response & dose. Different LD value shows that all substances are poison. It depend on the amount of dose whether a substance is poison or remedy. In Our research paper we will discuss the different doses, their routes of administration, Lethal, Chronic & Acute toxicity on rats & mice. For the calculation of LD50, Hodge , Sterner , Gosselin, Smith & Hodge scale was used. In this study, different doses (about 10 to 10,000 mg/kg) of the extract were administered by different route to the different groups of rats and mice. Experiments were carried out to observe the toxicity & possible death of animal like rat & mice continuously for 24 hour to calculate LD50 for different drugs.

Keywords: Median Lethal Dose (LD50), Acute & Chronic toxicity, Dose response Complexities

Synthesis and Spectroscopic Studies of Copper(II) Complexes of Thiosemicarbazide based Ligand

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Abstract: Cu (II) complexes were synthesized with thiosemicarbazide based ligands. These complexes are characterized by elemental detection, molar conductance, magnetic susceptibility measurement and studies like, mass, UV-vis and IR. The measurement of molar conductance of the complexes indicates that all complexes are non-electrolyte and thus these complexes may be formulated as $[M(L)2X2]$ [$M = Cu^{2+}$, $L = L1$, $X = Cl^-$, $1/2SO_4^{2-}$]. There are all complexes of high-spin type. These above studies may assigned a tetragonal geometry for Cu(II) complexes.

Keywords: 2-acetyl pyridine thiosemicarbazone, complexes of Cu(II), EPR spectral studies.

Emerging Ethical Dilemmas in Science and Technology

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Abstract: Human beings are struggling with ethical dilemmas on a daily basis because there are situations where we are not able to decide what is the right thing to do in a particular situation? Unfortunately, these ethical and moral dilemmas are also articulated in science and technology. Technology, science and knowledge are very important in modern contemporary society. On one side, man has progressed a lot in the field of science and technology and on the other side, the impact and the role of techno ethics has evolved at a faster pace. So, this research paper will discuss the ethical issues concerning the fundamental problems, applications and the consequences of science and technology on the life of human beings. The research paper will also emphasize on what are the ethical dilemmas that surrounds in the production of new manufacturing processes and what are the ethical questions concerning the production of technologies that waste or conserve resources and energy.

Keywords : Ethical, dilemmas, moral

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Social media and bank marketing

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Abstract:This study is intended to examine the role of social media and internet banking on Relationship Marketing(RM). The objective is to comprehend why some banks are reluctant to accept the trend of Web 2.0, how it supports their approaches of RM and what alternative ways to move forward customer relationships might be. The paper focuses on the practices of banks that are not yet investigated. A qualitative analysis was carried out, explaining the practices and relationship marketing approach of retail banks. Data were collected through questionnaires, interviews and secondary sources like official websites of banks. The findings state that the banks are less likely to use social media for marketing because of safety concerns, age and technological barriers. However, new banks should adopt social media to increase their market share.

Keywords:Banks, Relationship marketing, social media, Customer engagement

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Ethical Responsibility of Engineers for Sustainable Development

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Abstract: Engineers play vital role in progress and development through their research and innovations. Engineers are problem solvers who apply their knowledge and experience to build projects that meet human needs and make their life more comfortable. But defining success of engineering product in terms of how comfortable life has been made by particular development or how much profit has been earned though that would be having a narrow vision. Any development should be such that with the fulfilment of the needs of present generation, needs of future generation are also kept in mind, thus there is responsibility towards the sustainable development. It is noticeable that for sustainable development along with the technological changes, consumption patterns must be changed. So some restrictions has to be posed.

This paper addresses ethical issues associated with technological developments and discusses how engineers can contribute to more sustainable development without compromising quality of life, individual freedom and democratic rights. Some key questions this article will address are:What are the needs of future generation that has to be taken care of in present? What kind of changes required in technologies that will support sustainable development? Is all the responsibility on the shoulders of engineers?What compromises has to be made by present generation?

Keywords: Sustainable development, engineers, human need

Live Monitoring For Forensic Artifacts from IM Messenger Packets Using Freeware

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Abstract: Numerous smartphone applications such as snapchat pose a major problem for a network administrator, as the chat gets deleted automatically removing every evidence of a conversation. It becomes difficult for an administrator to confirm whereabouts of a captured packet belonging to an IM application. However, if the same is captured in real time using Wireshark-a detailed analysis of the protocols would reveal information regarding the source of packet generation. This paper emulates a closed environment and uses freeware to capture encrypted packets from instant messengers and attempts to produce sufficient artifacts, so as to pin point the sender.

Keywords: Wireshark, Network Forensics, SnapChat, Controlled environment, IM Packets, QUIC, STUN

Augment Reality in Education System – A Review

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Abstract

In recent years, our system is more focusing on Augment Reality (AR) to create innovative and advanced education system. As augment reality is coexist system of virtual reality and real world which give instant feedback and more clarification or other hand we can understand it by saying it is layer of virtual object on real object and run them interactively in real time. The only purpose behind introducing augment reality is to encourage and motivate students towards learning. This paper review will contain various different definition of augment reality on the basis of different review papers, it will also give idea about latest technologies are using in AR, how the changes are occurred from the beginning to now, its current status in education system, how its impact are different from simple learning way of literature or science, its role in teaching, what are its limitations and how it will effect in development of AR, what challenges will occur like availability of adaption . After that we will find out chances of future research in AR for researchers and designers. At last, we can inference by analyzing different journal review papers that augment reality is gradually taking place in education system at worldwide.

Keywords: Augment Reality, Current status of AR, Development of AR, Challenges of AR, Impact of AR

Security Challenges in IoT Cyber World

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Abstract: The increasing popularity of IoT has opened a new domain in computing. With the continuous gain in its uses and its implementation in various fields, new attack vectors are open. Depending on the uses IoT will attract more attack, and they will be easily affected by these attackers as initial AI-based systems are not designed considering majority security aspects, as initially development phase is more important and deserve more attention. The existing cloud systems are also not equipped with desired security measured to cope up with continued Advance Persistent Threat attacks. Developing protections in these areas is an ongoing struggle. The existing approaches like avoiding access to the device from an external network, Periodic rebooting to get rid of malware, continuous checking for new firmware versions and updation of the device, Using complex passwords, Changing the factory passwords at initial setup, blocking unused ports, depending on the options, need to be strengthen, or may be used in such a way so that they can be effectively used for securing IoT. Physical layer designing is the best way to ensure security. Considering all these in this chapter we have discussed major security challenges for the IoT and explored all the possibility to secure it, without making any major changes in the existing infrastructure.

Keywords: IoT, AI, Cyber Security

Social Media a cyber-security concept- Review

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Abstract: Social media are basically electronic communication forms through which users can build online communities to share ideas, opinions, information, messages, and other content types in different formats, including text, pictures, and videos [1]. In the last few years, we have been witnessing an explosive growth in information being generated and shared in social media. The speed at which social media has proliferated is unprecedented in the history of technological revolution. The continuous progress in social media and related technologies and platforms has led to an ecosystem where users with different cultural backgrounds and making use of various devices (e.g., desktops, tablets, laptops, smartphones) on various social platforms (e.g., Facebook, Twitter, Google+) interact with a variety of products, services, and ideas for various functions including publishing (e.g., tumblr, Quora, Wikia), sharing (e.g., YouTube, Instagram, Pinterest), playing (e.g., Zynga, Playfish, Playdom), net-working (e.g., LinkedIn, Myspace, Tagged), buying (e.g., tripadvisor, Boosket, hunch), and localization (e.g., Foursquare, yelp, Path)[21]. Corcoran [22] has divided the social media ecosystem into three types: owned media (monitored by the founder/marketers such as a company website or blogs), paid media (purchased by the founder/marketer, such as sponsorships or advertisement).

Keywords: social media, cyber security, spam, malware

Fairness in Internet flow and its cost

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Abstract: Fairness measuring is tough work. It has different view for socially and technically. How to decide that which measurement of cost of internet is fair? Its definition change according to time and requirement. Still we say that fairness is to distribute are all resources equally to everyone but it is also not good because someone is able to use resource efficiently and someone is not. So who doesn't do, it is wastage of resources. We have to apply algorithm to make efficient use of resources with fairness.

Kelly given a thought of cost based internet and congestion of path by internet user how much a person make an easy flow of other user should be used for cost determination internet but it is also unpredictable of cost for user because user does not know about rate of internet at particular time it very time to time. Suppose or one person user make uneasy to other flow on internet lot of charge will be taken from user because it is cost of congestion or making an uneasy to other people. While when internet path be is free internet price will low because someone used internet at the time when all, so cost is changing according to requirements. So It I unpredictable to know what cost is taken from user.

Another concept is weighted proportional fairness interesting that is what regulates user in their choice of weight W fairness among economic entity seems practical there are different techniques for measuring cost. To measure cost efficiently we can see user's history. so fairness measuring individual history should be considered without affecting scalability router based flow rate is not good it does not think about history and commercial polity does arbitrary fairness generate frustration among user if we so then router will decide fairness. Different user generate different volume of data so comparison based on data is also good subject for comparison cost congestion. Marginal Cost another factor is also generated that is monitoring cost this external cost factor and marginal cost is also considered because to consider and calculation extra expenditure also generated that is considered in marginal cost. Sometime it is also possible that pay for what other get. we use of phrase "you get what you pay for" In starting there was a router based min Max algorithm in 1985 Nagli provide fair queuing algorithm for equal rights to each source in 1985 waited for so shall overcome proposed for source destination fear 1991 Maunder at all provide Game Theory for fairness in 1997 Kelly said that of weight proportional fairness is not suitable he kissed idea of waited proposals acne using the weighted of a floor as a little factor Kelly show cost fairness in terms of bit instead of flow Kelly's work on pricing condition network issues max mean Bellevue choose and only when it is freedom put choose cost best on betrayed pc piece congestion evidence least two a form of fearless Shimla to cost family session sets arc is an algorithm that converges on the same flight and tcp at equilibrium that specific fairness problem because it's design was based on the broken idea. Fairness on flow rates is a false god it has no grounding in philosophy, science, or for that matter „commercial reality. It is a classic case of a hegemony where those living within the box dont recognize the existence of the box, let alone the world outside the box. Outside the box, cost fairness was derived from economic concepts of fairness back in 1997. The Internet community continues to judge fairness using flow rates, apparently unaware that this approach has been shown to have no intellectual basis. These flow rate fairness algorithms are myopic in both space and time, they are completely unable to control fairness at all, because they dont adjust depending on how many flows users create and for how long. In real life, fairness generally concerns costs or benefits. Flow rate doesnt come anywhere near being a good model of either.

Keywords: Internet flow, fairness, user's

Toward Net Zero Energy Building: Active and passive design strategies

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Abstract: Buildings are found to be an essential part of the needed transition towards energy sustainability. In the past few years, there have been growing interests in net zero energy buildings (NZEB) adapted worldwide. The minimized energy demand and airtightness of a passive house and the low energy buildings have provided in the past a step forward to the energy efficiency goal and the net-zero energy building. Implementation of proven energy efficiency technologies offers the world the fastest, most economical, and most environmentally benign way to alleviate threats.

This paper will discuss Net Zero Energy Building definition and design strategies targeting for energy efficiency and environmental sustainability. The literature shows that to improve the integrated performance of the building and to achieve the goal of energy efficient and NZEB, appropriate active and passive design strategies should have adapted. Also, energy demand should be reduced to a minimum, through energy efficient building designs, leaving only a fraction of the energy required to be covered by renewable energy generation.

Keywords: Net Zero Energy buildings, Energy efficiency, design, Active strategies, passive strategies.

BIM-based facility management: Benefits and challenges

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Abstract: For the past few decades, construction industry has seen slow and steady growth with respect to innovation and productivity. This debate was finally renewed with the introduction of building information modeling (BIM), which has emerged as a probable solution for facility managers to counter the challenges of poor interoperability and information handling during project handover stage. However, despite the advantages like automation in data entry and ease of accessing the data, BIM in facility management (FM) is being adopted very slowly. A comprehensive literature review reveals that there is an improvement related to the accuracy of facility management data which increases the efficiency of executing work orders. It also reveals that using BIM in FM for existing buildings is a challenging task with very few real world case studies. This paper aims to analyze the values added by BIM in FM and the challenges that obstruct the exploitation of the same. In particular, this paper contains a qualitative study of the state-of-art literature scrutinizing the interactions of BIM and FM.

Keywords: Building information modeling, efficiency, facility management, facility managers,

interoperability.

Affordable Housing: Rights of Citizen

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Abstract: Housing is a constitutional human right of a citizen, which includes shelter, drinking water and sanitation etc. This right is essential for meaningful life, for health, for dignity, for empowerment and prosperity.

The right to housing, drinking water and sanitation are such rights which must be easily available, accessible, safe, acceptable and affordable for all without any discrimination. Although, these elements are interrelated, but accessibility and affordability are far away from achievability. While access to shelter, drinking water and sanitation may be guaranteed in constitution but in reality it is too expensive, people do not have access, as they do not have money to buy. Thus, at present, this constitutional right is a theoretical right only.

Providing affordable housing is a major challenge. Many government and private institutions and organizations are active in this sector with nebulous responsibilities and accountabilities. If there is any inability or inefficiency the sufferer is end-user i.e. common citizen. This paper looks at the rights for affordable housing, drinking water and sanitation and its effects on realistic life. It analyzes the situation at present for common citizen within the existing law and government run service delivery system.

This paper will also explain, why it is necessary, to know, more clearly about the role of different institutions/organizations on whom, the citizen could approach for solution of a specific problem in getting a suitable shelter which is his right.

Keywords: Housing, shelter, human right etc.

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Analysis of Overall Efficiency of Reed Bed Systems

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Abstract: Large amount of grey water generates in India every year but not all of this undergoes proper treatment due to economic reasons. This dirty water causes nuisances and health related issues in all living objects, animals and humans as well. India accounted for about 28 per cent of, the estimated nine million pollution linked deaths worldwide in 2015. Reason for the same is “non-availability of sufficient monetary and other essential resources” everywhere, to treat the polluted water efficiently, using the conventional methods of waste water treatment.

There is an alternate method which treats waste water in natural way by using plants like Reed, Canna Indica etc. In the present study, these low cost sub-surface flow wetlands, or reed beds were investigated not only for their potential in treating the grey water component but also to evaluate their acceptance as an appropriate technology in rural as well as urban areas. The aim of this study is to determine if reed beds could provide an affordable, economical, healthier and more sustainable sanitation alternative suitable for all the demographic areas. For this purpose, two case studies were made of “Centre of Science and Environment” and “Holy Family Hospital”. These two places were visited to assess the requirements and the performance of their reed bed system. These two plants were working perfectly fine and treating the grey water to generate treated water at the outlet. These reed beds also added to the aesthetics of these places. This research has demonstrated that reed beds with simple and low maintenance design features are able to provide an appropriate and affordable technological solution for the treatment of greywater.

Keywords: Wetlands, Reed beds, Canna Indica etc.

Analysis of Seismic Strengthening of RC Structure Using Shear Wall

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Abstract: India has a history of witnessing disastrous seismic earthquakes having devastating results. In India, earthquake results due to the movement of the Indian tectonic plate at the rate of 47 mm every year. Seismic waves produce ground motions which affect humans in form of destruction of property and loss of life. India is the future hub of tall multistoried structures due to economic development and scarcity of land in metropolitan regions. The shear walls are structural members which provide safety and stability to the structure against lateral loads such as seismic, wind or other horizontal thrusts. These walls being a rigid vertical diaphragm resist the seismic loads due to Cantilever Action. The shear walls are recommended in the highly seismic active zones for the structure to counter seismic vibrations due to earthquakes. Such reinforced concrete walls propose seismic strengthening of the structure by controlling lateral displacement strength, stiffness and resist in-plane loads that are applied along its height.

This research paper emphasis on seismic strengthening analysis of Multistory structure (G+5). The structures comprises of both symmetrical and irregular shaped reinforced concrete structures for considering twisting effects, due to asymmetry in construction. The shear walls were positioned at distinctive locations in plan and story-wise displacements in the structures were compared. The results were analyzed based on equivalent static and time history methods. The structures were designed as per STAAD (SS5) & E TABS (2013) on basis of IS codal provisions. From the results, it was concluded that the floor displacements were minimized significantly withstanding the seismic vibrations.

Keywords: Shear wall, earthquake, seismic strength

Biomimcry: Nature Based Solutions to Construction Engineering

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Abstract: From different studies based on theoretical aspect and experimental analysis to technology based inventions, humans still seeks different ways to find and optimize solution to complex problems whether are related to sciences, engineering or to any other fields. At last human finds interest in nature and its aspects. Today many researchers are interested in nature based solution or innovation. Biomimetics is one of the fields inspired from nature. An inspiration derived from the nature itself by the principles of biology to explore different possibilities like flying birds to insects transform into airplanes, from the action of load carrying of tree to foundation design and bridge design etc. This paper attempts to present a review to the existing innovations which are inspired from nature in the field of civil engineering based on material properties and structurally. Different examples are also analyzed and with the help of which it concluded that there are numerous reasons to adopt the biomimcry which serves as useful analogy to the development of technologies based on biomimicry.

Keywords: Biomimcry, nature based, biology, Structure, Innovation

Study of adsorption of lead ions from wastewater by polyaniline coated bel leaf powder in a packed bed

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Abstract: Bio sorbents are commonly used in removing toxic heavy metal ions from wastewater. Bel leaves are used in temples and immersed in water after offering prayers since ancient times. In the present study, a packed bed continuous column was used to remove lead ions from contaminated water with modified bel leaf powder. The bel leaf powder was polymerised during in-situ polymerisation of aniline in the presence of strong oxidant at low temperature. This modified polyaniline coated bel leaf powder had more capacity to adsorb lead ions. It adsorbed 97.6% lead ion as compared to 90% adsorbed by raw bel leaf powder. Packed column dynamics were also studied for different flow rates (5-25 mL/min) of the adsorbate at different depths along the column. Clogging of the pores and channelization was observed along the column with passage of time, which led to change in lead ion concentration, % removal, adsorption capacity and time of exhaustion along the length of the column. Maximum lead ion removal obtained was 19.1mg, 18.7 mg, 18.36 mg and 18.05 mg at the ends of sections S1, S2, S3 and S4. The exhaustion time was 46 mins, 51 mins, 61 mins and 70 mins respectively for sections S1, S2, S3 and S4. Desorption study showed 96.3% desorption of lead with 0.1 M HCl as eluent.

Keywords: Adsorption, desorption, lead ions, packed bed, polyaniline coated bel leaf powder

A Review of comparative study between inorganic and organic solar cells

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Abstract: Solar energy is currently the most widely exploited alternative energy and cost effective approach to resolve the energy, environment and economic challenges related to the increasing population. It is an inexhaustible and effortlessly open wellspring of sustainable power source accessible on earth, which in addition, is noted for its high unwavering quality than different frameworks and permits more energy generation than other inexhaustible assets. Solar energy can be harnessed through thermal concentrators or through the incorporation of photovoltaic cells. Furthermore, to utilize solar energy - numerous sorts of photovoltaic (PV) devices like organic, inorganic, and hybrid cells have been developed. Inorganic PV cells are of different types and include the use of conventional monocrystalline silicon, polysilicon; thin-film cells based on the use of amorphous Si, Cd Te, or CIGS and; III-V compounds. Their application in various operations is based on the efficiency, mean life and cost of cells. Organic PV (OPV) cells deal with conductive organic polymers and require a bulk heterojunction (BHJ), which can be fabricated by mixing p-type and n-type semiconductors, involving fullerene derivatives. OPVs are lightweight, potentially disposable, flexible, and have less adverse environmental impact as compared to IPVs. The inefficiency and stability problems of OPVs, combined with the promise of lower costs and potential usage in clean energy and sustainable development projects have made them a popular field in solar cell research.

Keywords: Alternative energy, inorganic solar cells, organic solar cells, photovoltaic cells, solar energy,

sustainable development

Microplastic impacts due to the discharge of treated waste water into surface water bodies

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Abstract: Worldwide plastic production and its use has increased since 1950 (Plastic Europe 2013). Consequently, million tons of plastic is directly discharged into oceans and landfills every day. Marine debris has been considered one of the most important emerging environmental problems along with the climate change that can affect the human ability to conserve the biodiversity in mid and near future. Plastics entering the benthic and pelagic habitats of all oceans, comes in a wide range from microscopic to meters. Microplastic, are plastic fragments with small size range of less than 5 micro meter (Browne et al.), Due to their small size, they are easily bioavailable to organisms throughout the food-web in an aquatic environment (Zhao et al 2014). Their large surface to volume ratio and chemical composition, persistent organic pollutants can easily be absorbed onto micro plastics to accumulate at concentrations several times higher than in seawater. The increasing concern related to microplastics due to their also easy entry to the human food chain through digestion of fish, shellfish and filter feeders, causing potential human health impacts (UNEP, 2015; GESAMP, 2016) make this project timely and problem solving for future water use.

Keywords: Microplastic, waste water, surface bodies, aquatic life

Single OTRA based low power grounded capacitance multiplier

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Abstract- The paper presents a single Operational Trans-resistance Amplifier (OTRA) based novel, low power and a high multiplication factor achieving, grounded capacitance multiplier. Recently, OTRA is being used extensively as an alternate analog building block owing to its inheritance of advantages from current mode techniques. Parasitic resistance and capacitance have been nullified to a large extent by internal grounding of both input terminals of OTRA. The multiplicative gain is tunable with high precision over decades. The proposed structure enjoys two degree of freedom in terms of simulating a multiplied capacitance adding to its versatility. The circuit also portrays a high nature of uniformity and compactness by utilizing a single active block with a voltage buffer thereby, reducing the silicon area consumption on the chip making it ideal for integration purpose. The design proposed imposes only a single matching condition. Temperature independence can be ensured by replacing the floating impedance by Operational Trans-conductance Amplifier (OTA) simulated floating resistor. Thus, it would contribute towards the circuit robustness and support large number of applications in areas ranging from industries to military discipline. The theoretical estimates mentioned above are justified through spice simulation using 180nm CMOS technology. Various filter topologies have been implemented utilizing the simulated multiplied capacitance. Low frequency operation is made possible without making use of a large valued capacitor, thus saving both area and power which plays a crucial role in all biomedical applications. Frequency response has been presented in order to justify the soundness of the presented circuit.

Keywords: ORTA, power, parasitic resistance, capacitance

Confluence of science, technology and arts: An assessment

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Abstract: The world is moving fast from singularity of disciplines to plurality and the modern innovation ecosystem largely depends on interdisciplinary to multidisciplinary areas to achieve the state-of-the-art product. The synchronizations, alliances, and combinations of different subjects are now almost essential for creation of new knowledge and innovation. If we look around ourselves, we'll find that such interactions between disciplines are enormous and quite visible. For example, a cellphone is a fine blend of wireless communication technology, designing, material science, social and health aspects from different perspectives. Even people are now looking for trendy and fashionable handsets with different functional requirements. The present paper gives an assessment of such aspects of different products with innovative combinations, which are people friendly and cost effective. One can find customized cellphones for differently abled persons as well. The days are gone when simple and single patent technologies were largely in use; but now look at any simplest gadget or technology, it will be based on multiple patents, designers and copyrights, etc. The study suggests a great shift of a linear kind of innovation to much more sophisticated innovation, where the confluence to science, technology and arts is paramount for not only research and development but also marketing and social acceptability of a particular innovation, technology or product. With the rise in the dependability of newfangled communication, agricultural, transportation, nano, etc., technologies and sciences, a new co-relation between these technologies and the arts is coming into vogue. History shows that these disciplines cannot exist in isolation, as they need to constantly change and evolve to coexist and bring forth their own creative avenues with infinite possibilities.

Keywords: Science and arts, interdisciplinary, multidisciplinary, innovation, confluence

Adaption of Power Gating in Positive Feedback Adiabatic Logic Circuits

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Abstract: Excessive use of portable electronics like smart phones and laptops is the norm of today's world, so is the need of a longer battery lifetime. Power dissipation of a circuit, being the most important factor dictating its battery lifetime, is desired to be as low as possible. Many techniques like voltage scaling and shrinking feature size have been employed in static CMOS circuits which help in reducing power dissipation. Adiabatic logic is yet another logic style wherein charge is recovered back to power supply from the load capacitance. Therefore, this logic style has great potential which has motivated researcher to derive and develop adiabatic logic circuit. Among various adiabatic logic families, Positive Feedback Adiabatic Logic (PFAL), a quasi-static and differential logic adiabatic family, is one of the most robust, with significant reduction in power consumption has been chosen in this work.

Power gating technique is prevalent in static CMOS to save power in idle state. It has been adapted in PFAL family, to further reduce power dissipation. Power gating is accomplished by using sleep state control units that switch the circuits between awake and idle states by isolating one of the power rails V_{clk} (Power Clock) or ground. Two power gating methodologies, footer and header, have been evaluated and compared.

Functionality verification and power evaluations have been performed using Tanner TSPICE simulations on 180nm technology node with TSMC CMOS parameters. The power consumption has been examined by varying supply voltage, frequency of the power clock signal and load capacitance. The observed overhead in awake state power dissipations is compensated for with the significant decrease in idle state power dissipation, with footer gated structures having approximately one fourth power dissipation in idle state as compared to its ungated counterpart whereas header gated structures have almost negligible idle state power consumption.

Keywords: Power Efficient Circuits, Adiabatic Logic, PFAL, Power Gating, Low power VLSI

Renewable Energy Fed DC Micro grid- An Overview

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Abstract: This paper lays emphasis on need of renewable energy sources for power due to increase in the demand for energy and depletion of conventional sources of energy. We propose to integrate the renewable energy with our DC Micro grid. In this paper we study the interfacing of the Solar P-V, Wind turbine with the DC Micro grid through the rectifier, Buck Boost and Fly back converter respectively. We present a model of a wind turbine using a Fly back converter as it can provide isolation due to the use of high frequency transformer in its design. This isolation provides the advantage of protection of the DC link from any fault on the wind turbine or synchronous generator side. The emphasis is to investigate performance of P-V with Buck Boost converter. We also apply the Perturb and Observe MPPT tracking technique on the respective converters to vary the operating point so as to extract the maximum power and keep the DC-link voltage constant. Further the model of generating wind and solar energy performance on the MATLAB/SIMULINK environment.

Keywords: Solar P-V, Wind turbine, DC micro grid, Fly back converter, Buck-Boost converter, MPPT

Load Flow solutions of Radial Distribution System

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Abstract: The load flow analysis of distribution system is performed by two methods. The first method is backward forward sweep (BFS) based method and other method is bus injected branch current (BIBC) and branch current and bus voltage (BCBV) based method. In present paper BFS based method has been implemented on IEEE-15 bus radial distribution system in order to determine the system voltage profile along with phase magnitude at different buses and branch current in various branches of the network. The methods are applied for load flow solutions of distribution system are different from load flow solutions of transmission system because of their properties. The Gauss-Siedel (GS) and Newton Raphson (NR) based methods are applicable for transmission system load flow solutions, these methods do not provide satisfactory results because of their inherent properties R/X ratio is small. Therefore, these methods face the convergence problem. But for distribution system R/X ratio is more hence BFS and BIBC and BCBV based methods are applicable due to this property the distribution system have more system loss. In this paper distribution system losses are calculated for further course of action such as expansion planning and restructuring of existing system to meet the future load demand.

Keywords: Load flow, radial distribution, backward forward sweep, bus injected branch current

Harmonics Elimination in Three Phase Rectified R and RL Load using Distribution Static Compensator

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Abstract - The nonlinear loads at consumer end nowadays has caused a tremendous strain on the power system supply. Because of this the three-phase distribution systems are having severe power quality problems such as load unbalancing, harmonic current, burden of high reactive power, poor voltage regulation. That's why devices that provide reactive power compensation, harmonics elimination, load balancing, and neutral current compensation have become extremely crucial. One such device is the Distribution Static Compensator (DSTATCOM). This paper deals with the simulation and hardware implementation of DSTATCOM. It is used to remove current harmonics of a three phase power supply connected to a rectified resistive & inductive load.

The simulation of DSTATCOM using Synchronous Reference Frame Technique (SRFT) control scheme in SIMULINK has been done to ensure satisfactory results. The Hardware implementation of DSTATCOM is then done using DSPICE as controller with the same parameters as used in simulation. Currents and voltages are sensed using sensors which have been developed and are fed to the DSPICE. According to these inputs, DSPICE changes the duty cycle of PWM signals to the IGBT switches of a voltage source converter (VSC) connected to a capacitor.

Keywords – DSTATCOM, DSPICE , Synchronous Reference Frame Technique(SRFT), Voltage Source Converter(VSC)

Biofuel: Fuel of Future

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Abstract - With the increase in the demand of the fuels for the rapid growth of the civilization concerns related to it like climate change, high prices, availability for the future are also increasing day by day. Their byproducts which formed due to use of them are showing harmful effects on the climate and majority of the fuels are non renewable or they take long time to regenerate.

Biofuels can be a perfect alternative to the major fuels we are using today. As they use biomass like agricultural products or residues, industrial and urban residues, wood residuals and forest products, either as liquid or as gas for the generation of the fuel and ideally it is considered as a carbon neutral fuel which should not contribute to the overall accumulation of carbon in atmosphere. Its property of being miscible with petroleum fuels gives it a huge advantage to become an alternative. Many European countries has started replacing their major fuel with this biofuel and are developing technologies which use biofuel as fuel efficiently.

In this study, comparative analysis of biofuel and petroleum fuel is being studied with their advantages and disadvantages over each other and also the steps being taken for the implementation of biofuel and its future in India.

Keywords: biofuel, petroleum fuel, biomass, agricultural products

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Constructed Wetland System for Mercury Removal - A Review

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Abstract: The first experiment in the field of constructed wetland system was undertaken in the early 1950 by German botanist Dr. Kathe Seidel. The first full scaled constructed wetland system was operated during 1960s and after its successful use constructed wetland system has been used as a economical substitute over other methods for treating small to large volume of wastewater having varying contamination level. Researchers have made many attempts to understand the complex parallel processes involved to remove mercury using constructed wetland system (CWS) containing macrophytes, microorganisms and soil matrix. Some species of bacteria transformed mercury into methyl mercury which has ability to easily accumulate in the fish and in some species of wildy grown mushroom. Both elemental mercury and methyl mercury also biomagnifies using many pathways and thus increases their concentration in higher life forms. Exposure to methyl mercury exerts toxic effects on digestive, immune and nervous system and also adversely damages kidney, lung, skin and eyes. World Health Organization recognized mercury as one of the major toxic chemical damaging living creature. The present paper reviews literature related to development of constructed wetland and summarizes important studies undertaken to efficiently remove mercury from wastewater.

Keywords: Constructed Wetlands System, Macrophytes, Wastewater Treatment

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Study on Behavior of Various Aggregation Functions to Calculate Leachate Pollution Index for Ghazipur Landfill Site

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Abstract: To report the leachate pollution potential uniformly of a landfill site on a comparative scale a pollution index known as Leachate Pollution Index (LPI) has been developed and reported. The LPI is an increasing scale index and Delphi Technique is used to formulate it. The LPI is developed in four basic steps which are selecting the pollutant variable, deriving a weight for each selected pollutant variable, formulating their sub-indices curve and finally aggregating them using appropriate aggregation function. The aggregation function is the most vital step for formulating LPI value. If the aggregation function used is ambiguous in nature then it will report high pollution potential for a less contaminated site which would an unnecessary alarm. And if the aggregation function is eclipsed in nature then it would report less potential of a polluted site even though it is highly contaminated and would create a false sense of security. In this paper, the theory of LPI is discussed in concise, and various aggregation function which is used to calculate the environmental pollution is described and using these aggregation function LPI value for Ghazipur landfill is calculated and reported. The most appropriate aggregation function is selected on the basis of various principles. Based on the outcome of various aggregation functions, it is concluded that the weighted linear sum aggregation function is the most suitable aggregation function for calculating LPI value. The sensitivity analysis for the weighted aggregation function is also carried out to substantiate the conclusion.

Keywords: Leachate, Leachate Pollution Index, Aggregation Fuction, Sensitivity Analysis

Assessment of the Effectiveness of Zero Discharge System in Treating Tannery Industry Effluent

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Abstract: It has been assessed that 501 MLD of industrial effluent is being discharged by water polluting industries through the drains of tributaries into River Ganga. Tannery effluent contains Total dissolved solids in concentration several times higher than the prescribed limit which is contributed by the common salt used for preservation of skins and hides as well as by the inorganic salts and chemicals used in the tanning process. The conventional wastewater treatment methods used for effluent treatment are mainly aimed to treat organic matter and do not help in reduction of inorganic TDS due to inorganic constituents. It is required to adopt extra measures to meet the CETP effluent standard for TDS. The tanneries clusters in Tamil Nadu have adopted Zero liquid discharge systems in order to meet with the TDS norms. ZLD systems have been implemented for all tanneries CETPs in Tamil Nadu and some of them are already operating successfully for quite some time while others are under stabilization. However, tanneries clusters in northern India, which include Unnao and Kanpur clusters in Ganga basin are yet to take measures to meet the CETP effluent standard for TDS. This paper compares the values of TDS, BOD, Sulphates and Chlorides concentrations provided by CPCB between tanneries situated at Vellore district of Tamil Nadu which have implemented ZLD systems and at Unnao, Uttar Pradesh which do not have a ZLD system. The data is compared graphically and conclusions are made on the effect of implementation of ZLD systems for tannery effluent treatment.

Keywords: Zero Liquid Discharge, Tannery, Total Dissolved Solids, Sulphates, BOD, Chlorides

Accumulation and Distribution of Toxic Metals in Selected Vegetables and Cereals Crop Irrigated by Wastewater

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Abstract: Worldwide, an estimated 200 million farmers irrigate at least 20 million hectares (ha) with raw or partially treated wastewater accounting for 8% of total worldwide irrigated land, of which two thirds lies in Asia. In many areas of developing countries, untreated or partially treated wastewater flows through channels into rivers where it is diverted by farmers to small farms of vegetables and cereals crop. Analysis of physico-chemical parameters of wastewater i.e. colour, pH, DO, BOD, COD, total organic carbon, nitrate and phosphates done in laboratory. Plant growth parameters like root length, shoot length, leaf number and accumulation and translocation of toxic metals such as Cu, Cd, Cr, Zn, Fe, Ni, Mn and Pb in various plant parts (root, shoot, leaves and seed) has been reported. Results showed that, wastewater which have high amount of organic matter and nutrients will increase the crop yield in comparison to well water. It also increases total N, P, K and organic carbon content of the soil-water system. Maximum accumulation of Fe followed by Mn and Cr reported in roots and Zn and Mn in seeds of the selected crops. In India, encountering the problems of water scarcity and high cost of fertilizers wastewater could be successfully used for irrigation. The study on the irrigation of wastewater on selected crops is intended to provide guidance to national planners and decision-makers, agricultural and municipal managers, field engineers and scientists, health and agricultural field workers, wastewater treatment plant operators and farmers.

Keywords: Agricultural irrigation, national policies, toxic metals, vegetables/cereals, wastewater reuse

Leachate Characters and Impact at Bhalswa Landfill Site in Delhi, India

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Abstract: A liquid which drained or leaches through the waste at a landfill site is known as leachate. Leachate from a landfill varies widely in composition depending on the age of the landfill and the type of waste that it contains. It can usually contain both dissolved and suspended material. This study concentrate on the composition of various parameters of leachate collected from a highly saturated sanitary landfill sites at Bhalswa, Delhi. It has been found that Bhalswa landfill leachate have highest concentration of different parameters such as total dissolved solid, total solid and electrical conductivity i.e., 9890 mg/l, 12580 mg/l and 14892 mho/cm respectively. These results will be helpful in future for determination of expected impact on ground water and biodiversity due to generation and percolation of leachate. This study will also be helpful to deal with the possible low cost treatment methods.

Keywords: Organic matter, Heavy metals, Landfill, Leachate, TDS, TSS

Green Technology: Advantages and disadvantages

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Abstract: Due to the detrimental consequences of global warming and climate Change there is a rising demand of new technologies that can help prevent their effects. Going green is not a choice, but the need of the hour if we wish to protect the existence. Green Technology is one such technology that can help combat the ill-effects of the human activities on the planet. It encompasses evolution of such methods and techniques that aids in generation of clean energy, curbs pollution and conserve our natural resources and ultimately save the planet. This review paper puts forward several advantages offered by Green Technology and elucidates the obstacles in the implementation of the same. Some of the many aims of Green Technology are: achieving sustainability, creation of products that can be reclaimed and reused, reducing the generation of solid waste and pollution by changing consumption as well as production techniques and so on. Also It inculcates radical thinking for fundamental changes by adopting renewable sources of energy like Wind energy, Solar energy, Geothermal energy etc, and also focuses on cleaner manufacturing methods. Even though Green Technology is evolving at a rapid rate, the high cost of installation limits its application in certain countries due to economic instability. Moreover, factors like lack of awareness, human resource and skills poses many difficulties in its effective execution. Many of its components are still under research and development phase, hence the public is not mindful of the performances of the same. In many countries effective legislation has not been enforced to keep in check the environmental technology system. The objective of Clean Environment and Energy crisis cannot be solved in another one or two years but persistent effort by every individual will not only benefit the society in whole but also enhance the living conditions.

Keywords: Green technologies, Awareness, Advantage, Energy, Pollution

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Assessment of physicochemical characteristics of ground water around Bhalaswa lake, Delhi

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Abstract: Ground water is known as an important source of water supply all over the world. To assess ground water quality, ground water samples from 12 major sites, around the Bhalaswa lake were collected in monsoon season (September, 2018). All the samples were analyzed for various physico-chemical parameters: temperature, pH, electric conductivity, total dissolved solids, total alkalinity, total hardness, Cl^- , PO_4^{3-} , NO_3^- , Mg^{2+} by using standard analytical methods. The results were analyzed and compared with American Public Health Association (APHA), (USEPA) and World Health Organization (WHO) Water Quality Guidelines, Indian Standard Institution (ISI), Indian Council of Medical Research (ICMR) and Central Pollution Control Board (CPCB) drinking water standards. The range of physicochemical parameters like pH (7.8-9), EC (1303-2770 $\mu\text{S}/\text{cm}$), TDS (873-1855 mg/l), Total Alkalinity (125-250 mg/l), Total hardness 510-1080 mg/l, chloride (188-294 mg/l), magnesium (90.13-253.34 mg/l), sulphate (25.9-146.4 mg/l), nitrate (0 to 53.1 mg/l) and phosphate (2.13-6.13 mg/l) were found to be higher than the permissible limits assigned by various agencies. The results revealed that the ground water was not suitable for drinking purposes due to significantly high concentration in most of its studied physico-chemicals parameters and found beyond permissible limits in almost all water samples, collected from different locations around Bhalaswa lake. It was concluded from this study that the ground water of the area needs a substantial degree of purification treatment before using for drinking.

Keywords: Ground water, physicochemical, permissible, quality

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Case study of Civil engineering waste management for 50% Expansive soil & 50% Collapsible soil for control of Delhi NCR air pollution

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Abstract: Civil wastes are widely used in field for stabilization of expansive and collapsible soil. Civil wastes are used to improve the bearing capacity and settlement behavior of expansive soils in economic costs and environment friendly also. The various civil wastes having its load bearing capacity mainly from confinement of soil surrounding a wide variety of structures such as oil storage tanks, embankment etc. The effect of civil engineering waste is very huge in these days so it's a requirement to decline the civil waste by using it in various soil sample i.e. expansive soil 50% and Collapsible soil 50%. This will be very beneficial in decreasing air pollution in Delhi NCR as these wastes play vital role in increasing pollution and also effecting air quality index.

Keywords: Waste management, collapsible soil, civil waste

Case study of concrete road on collapsible soil using thermocol waste for NCR Delhi air pollution

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Abstract: Critical concrete pavement problems have been solved out in India during the past 33 years and results have laid to the environmental waste playing very important role to make road using thermocol waste on collapsible soil. This innovation paper give result of modern construction of highway problem in urban areas and construction management for rigid pavement, their universal nature city like London, Honkong and Singapore. Thermocol consumption in concrete and road pavement also deals with the environmental waste management and helps in making environment better.

Keywords: Concrete, thermocol, temprature, road pavement, etc.

Sustainable construction techniques -A way to reduce air pollution

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Abstract: Construction industries are among the most important sectors of our economy, on which half of the population depends directly or indirectly. It is the spine of national economy and other sectors as well. Apart from the contribution to the economy of a country, it also contributes in pollution severely, mainly on air pollution and landfills pollution which makes the city dusty and exposing living things on the site to respiratory ill, and hence causes the harmful disease. The particulate matter PM10 pollutants, are pollutants less than 10 micron in diameter which are invisible to the naked eyes, are the main cause of pollution which are induced from the construction dust. Construction dust are generally are of major types which are silica dust created when working on material such as concrete, mortal etc. and lower toxicity dust created when working on marble resulting causes silicosis, asthma, chronic obstructive pulmonary diseases. The study shows sustainable building materials are materials which are domestically created and sourced which decreases transportation cost and reduces the emission of carbon dioxide. They also consists of reused materials, they poses a lower environmental effects, they are thermally effective, and they need less energy than conventional building materials. They also make use of certain renewable resources and are lower in effects on air pollution as well economically sustainable.

Keywords: sustainable, building materials, air pollution, Green building, emission

Preliminary Assessment for the Potential of Citrus Limetta Peel Waste for Bioethanol Production under Indian Conditions

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Abstract: Brazil is the top producer of citrus fruits in the world with 20 million tons annually while India stands 5th on the list with total production of 6,286,000 tonnes annually. Citrus limetta being the third most cultivated species of citrus after orange and lemon with 4,200,000 metric tonnes produce annually in the world. CLPW is pectin rich agro waste and can be utilised for the production of bioethanol which can be used as a substitute for the conventional fuel as it is cleaner and cheaper fuel source. On overviewing different research work it can be concluded that fruit peel waste especially citrus fruit has a huge potential for bioethanol production rather discarded into the environment. The carbohydrates content of the solid waste can be determined by using Anthrone method. The fermentation is done in the bioreactor using the combination with the maximum reducing sugar yield and using *S. cerevisiae* as the microorganism. Dichromate method used for the analysis of ethanol production. The moisture content of waste was 80.59% of total weight. The average carbohydrates content of sample was found out to be 62.35% on wet weight whereas the ash content was 10.51% on dry weight basis. With increase in acid concentration there is decrease in reducing sugar yield and vice-versa. With increase in temperature there is increase in reducing sugar yield. It can also be concluded that reducing sugar yield was maximum at 150°C and without acid. It can be also concluded that rather throwing the peel waste it can be used as a source of energy production. It can be also concluded that the method used for treatment of waste can be serve as a tool for waste management.

Keywords: Bioethanol, Waste Management, Reducing Sugar, Fermentation, Moisture Content

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Study the Co-relation between Average Annual Temperature in El-Niño 3.4 region with Average Annual Temperature (Maxi. and Mini.) in India

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Abstract: Temperature plays the most important role in the economic development of any country in various ways. We study the effect of El-Nino at Indian temperature by establishing the the co-relation between Average Annual Temperature in El-Nino3.4 region and Average Annual temperature both maximum and minimum (Tmax & Tmin). To conduct the study, we took 39 stations across the India; out of which, 21 stations (Agra, Akola, Allahabad, Anantapur, Aurangabad, Bangalore, Baroda, Bhubaneswar, Bikaner, Dehradun, Gorakhpur, Guwahati, Gwalior, Hyderabad, Indore, Jabalpur, Jamshedpur, Kanpur, Mumbai, Mysore and Nagpur) are found to have positive linkage between Average Annual Temperature in El-Nino3.4 region and Average Annual maximum temperature. Rest of the 18 stations (Ajmer, Ambikapur, Amini, Amritsar, Bhopal, Cherrapunji, Darjeeling, Delhi, Dharamsala, Gaya, Gopalpur, Hissar, Jaipur, Jaisalmer, Jammu, Jodhpur, Karnal and Kolkata) had shown a negative linkage between Average Annual Temperature in El-Nino3.4 region and Average Annual maximum temperature. Further, out of total 39 stations, only 16 stations (Agra, Akola, Anantapur, Bangalore, Bhubaneswar, Delhi, Dharamsala, Gorakhpur, Guwahati, Hyderabad, Indore, Jammu, Jamshedpur, Kanpur, Mumbai, and Nagpur) had positive linkage between Average Annual Temperature in El-Nino3.4 region and Average Annual minimum temperature. Other 23 stations (Ajmer, Allahabad, Ambikapur, Amini, Amritsar, Aurangabad, Baroda, Bhopal, Bikaner, Cherrapunji, Darjeeling, Dehradun, Gaya, Gopalpur, Gwalior, Hissar, Jabalpur, Jaipur, Jaisalmer, Jodhpur, Karnal, Kolkata and Mysore) had negative linkage between Average Annual Temperature in El-Nino3.4 region and Average Annual minimum temperature. Hence in India, only at 21 stations, maximum average annual temperature increases with El-Nino and 16 stations have minimum average annual temperature increases with El-Nino

Green Roof: A sustainable Urban Ecosystem

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Abstract: Green building is defined as the practice of forming structures with the use of ecofriendly & resource efficient processes throughout the buildings construction life cycle from siting to design, operation, construction, maintenance, renovation & demolition. During the energy crisis of 1970s, green building emerged as an innovative concept. Further in this approach concept of 'Green roofs' as urban ecosystem is a blessing to this ecofriendly approach. Green roofs (roofs with a vegetated surface and substrate) provide ecosystem services in urban areas, including improved storm-water management, better regulation of building temperatures, reduced urban heat-island effects, and increased urban wildlife habitat. Approach pertaining to green roofs nested with green building examines the biotic and abiotic components that contribute to overall ecosystem services. We emphasize the potential for improving green-roof function by understanding the interactions between its ecosystem elements, especially the relationships among growing media, soil biota, and vegetation, and the interactions between community structure and ecosystem functioning. Further research into green-roof technology should assess the efficacy of green roofs compared to other technologies with similar ends, and ultimately focus on estimates of aggregate benefits at landscape scales and on more holistic cost-benefit analyses. Green buildings changes the flow of energy & matter through urban ecosystem which also causes environmental problems but can be partially mitigated by artificial building's surficial properties. Initially green roofs are initially quite expensive than conventional roofs but proved to be economical over the life span of roof due to energy saved & longevity of roof membranes. Conclusively, the idea of green building is economical, health oriented, energy efficient and most important ecofriendly, which is well suited for the purpose of sustainable development.

Keywords: Technology, building, ecofriendly, construction, green roofs

Biodiesel production as substitute to fossil fuel

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Abstract: Because of the expanding familiarity with the exhaustion of non-renewable energy source assets and natural issues, biodiesel gained increasingly more alluring in the recent years. As an elective fuel for diesel motors, it is becoming increasingly important because of decreasing oil holds and the ecological outcomes of fumes gases from oil fuelled motors. To limit the biofuel cost, recent day's waste cooking oil was utilized as feedstock. The utilized cooking oils are utilized as crude material, adaption of ceaseless transesterification process and recuperation of excellent glycerol from biodiesel result (glycerol) are essential alternatives to be considered to bring down the expense of biodiesel. There are four essential approaches to make biodiesel, coordinate use and mixing, miniaturized scale emulsions, warm splitting (pyrolysis) and transesterification. In any case, as the biodiesel is delivered from vegetable oils and creature fats, there are worries that biodiesel feedstock may contend with sustenance supply in the long haul. As of now, the rising oil cost, from ecological points of interest, government pricing policies, progress on agricultural yields and the higher GHG emanations from non-renewable energy source has convinced the strategy producers, financial specialists and scientists to think increasingly about the substitution of petroleum products to spare the planet. This paper reviews the history and recent improvements of Biodiesel, including the different types of biodiesel, the characteristics, processing and economics of Biodiesel industry. The utilization of biodiesel in vehicle industry, the difficulties of biodiesel industry improvement.

Key Words: Biodiesel, processes, transestrification, substitution

A Statistical Analysis of Corrosion Rate and Mechanical Properties of metal inert gas welding

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Abstract: In the present work an attempt has been made to optimize the process parameters of metal inert gas welding for aluminum pipes 6061 to evaluate the output quality characteristics using factorial design. An interaction effect of input parameters is also studied to predict their influence on the output response. The performance of MIG for aluminum pipe is evaluated in terms of joint's tensile strength and corrosion rate, factorial design technique has been employed using orthogonal array, ANOVA (analysis of variance) to study contribution of each parameter and interaction of them on output and confirmation tests at 95 % confidence level to compare with experimental results. Optimal combination of parameters is presented with a good agreement found between the estimated and experimental results within the preferred significant level after verifying experimentally. It was confirmed that factorial design with ANOVA and confirmation tests successfully improved the quality characteristics of tensile strength and corrosion rate of MIG process.

Keywords: Corrosion rate, gas welding, optimize, MIG

Experimental Investigation of Thermal energy storage with phase changing material

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Abstract: Solar energy is the most prospective source of energy in recent years. Investigation is going on to utilize the solar energy by various academicians and researchers. The main problem in harnessing and using solar energy is its discontinuous nature. Solar energy is not available continuously for 24 hours. So, there is a need to develop a method to store thermal energy during sunshine and utilize this stored energy as per requirement. Some materials available called phase changing materials (PCMs) which can store large amount of thermal energy in the form of latent heat. This energy can be used to heat the water for domestic purposes during evening hours. In this work, an experiment was carried out on parabolic solar concentrator to check the feasibility of using phase changing material as a solar energy storage medium to heat the water. Two containers were put on the concentrator to heat the same amount of water. One container was with PCM material and the other container was without PCM material. The energy efficiency of the system with PCM storage was greater than the system without PCM storage. It means that the PCM storage system is able to trap more of the incident radiation in the form of thermal energy. The exergy efficiency of the system with PCM storage was also higher than the system without PCM storage.

Key words: Solar energy, latent heat storage, phase change materials, solar concentrator, energy, exergy.

Synthetic Inflow Generator having Various Oscillations

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Abstract: Large Eddy Simulation (LES), which has recently been developed and used for the climate local environment and turbulent boundary layer flow, can be applied for a variety of area. In particular, in order to achieve a faster performance, an artificial generation of inflow turbulent flow would be necessary to make the faster convergence as well as to maintain the real turbulent flow in the calculation domain. In this study, the synthetic inflow generator has been developed based on spatial and temporal correlation functions, which have a form similar to an exponential function. This inflow data having various oscillation obtained by the synthetic inflow generator imposed into the inlet condition of LES simulation on a channel with smooth wall. In the result, fully developed turbulent boundary layer was successfully generated in the computational domain. In addition, the variation of oscillating inflow was taken into account to observe the effect of the fully developed turbulent boundary layer.

Keywords: LES, Synthetic inflow, Correlation, Various oscillation

Producing green Index for auto component manufacturers in India: A Graph-Theoretic Matrix Approach

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Abstract: The purpose of the paper is to produce a green index for auto-component manufacturers in India. In this study, some major factors have been identified through the literature review and consultation of the practitioners. These factors have again been divided into many sub-factors. On the basis of mutual interaction and comparison of each factor, permanent of the matrices for all these factors have been calculated using Graph the Matrix Approach (GMTA). Finally, the green index is calculated using the permanent of a matrix of all the factors and their interaction jointly. The interaction values incorporated in the matrix have been taken from the opinion of the practitioners. This index may vary from one enterprise to another based on the green practices followed by them. The index value of the organizations shows the comparative green performance of the organizations and the maximum value of the permanent of the matrix can be treated as the target value which is to be achieved. This method is very helping in improving the green performance of an organization since the measurement is subjective and qualitative. GTMA incorporates the measurement on some scale like 10-point rating scale as used in this study.

Keyword: Graph the ory matrix Approach, Green Manufacturing, permanent to fa matrix, green practices

Environmental Impact of Electric and Biodiesel Car - A Review

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Abstract: The transport industry has been an important sector, and controls a major portion in the country's economy. The transport sector are mainly dependent on fossil fuels. The amount of fossil fuels is limited and if we deplete the fossil fuels the future will be doubtful. The use of fossil fuels generate a lot of hazardous pollution such as CO, unburnt HC, NO_x and emission of greenhouse gases. Recently the environmental problems are increasing day by day because of the emissions. Therefore there is requirement to shift to cleaner fuels or alternate fuels. As the emissions are rising the demand for alternate fuels are increasing day by day. It is estimated that in the US, transportation sector consumes about 62% of the oil imported. Because of the rise in demand many researches have been made in the field of alternate fuels. Fuels with high oxygen content have the possibility to be used as an alternate fuel. Biodiesel is a substitute of diesel fuel, compound of ester (higher oxygen content). Another alternate to conventional fuels if the electric vehicles. The hybrid electric vehicle are mainly of two types on the basis of powertrain, firstly parallel and secondly series. The paper is a review work on different types of fuels used and throws light on the upper hand and downsides of the different fuels used. It also exhibits the effect of these fuels on the environment.

Keywords: Hybrid electric vehicles, Biodiesel, Emission, NO_x, CO

Design and Fabrication of Knuckle Joint

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Abstract: A knuckle joint is used to connect two rods carrying tensile load. This joint permits misalignment of the rods. It may take compressive load when it is guided. These joints are used for different types of connections. In this research paper a knuckle joint is designed on basis of calculation. Here the one of the rods has eye end and the other has fork with eyes at both the legs. A pin is inserted through the rod eye end and fork eye end is secured by a collar and a split pin. Screwed connections often play an important part in the transmission of load through machine assemblies. In large circuit breakers they are subjected intermittently to high impulsive loads transmitted to large scale linkages. This paper reports design procedure of a knuckle joint and its modelling. The knuckle joint modelling is performed by using „SOLID WORKS“. A prototype knuckle joint of polymer material was designed and got manufactured by 3 D printing. This prototype was subjected to tensile test, shear test and bending strength. Results obtained were within the prescribed limits.

Key words:Knuckle joint, 3D printing, solid works, eye end.

BIM-based energy analysis - A critical appraisal on prevailing methodologies

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Abstract: With the increased awareness of energy consumption and the environmental impact of the building construction, the stakeholders today are required to put more efforts on sustainability and energy performance of the building. In the recent years, Building information modeling (BIM) has emerged as the greatest and most challenging platform for AECO industry in the field of energy analysis and simulations. The aim of the paper is to review the available methodologies considering the energy analysis or simulation part of sustainability with the help of BIM/ green BIM that are predominant and to find out the imperfections in them. These methodologies become the dossier for the proposal to different approaches and the results by various researches have been discussed elaborately. There are tons of software that are available today that helps in designing an energy-efficient building taking input file from various BIM software mainly as IFC or gbXML format. Each software has its own limitations and the acceptance of using them to predict the correct results of energy analysis during the lifecycle of building is being questioned to validate. BIM adoption to simulate the sunlight for the installation of solar panels and for the fulfilment of other requirements with use of sunlight simulation tools was considered in the present study. The most important aspect of analysis is the interoperability between BIM and simulation software which has been examined and the feasibility to approach the methodologies has also been discussed. The scope and the parameters of the software are being reconsidered in order to find the differences and limitations along with the suggestions for further studies.

Keywords: BIM, energy analysis, energy-efficient, energy performance, simulation, sustainability.

Thermodynamic Study of Combined Cooling Heating and Power Generation by Condenser Heat Recovery Using R-134a

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Abstract:The increment in the rate of consumption of fossil fuels to fulfill industrial, commercial and domestic power requirement is being observed by EIA, US that more than 38% and more than 8% of the power generated in the world is consumed by the petroleum and chemical industry. This negative impact on the environment in form of higher amount of pollutants and toxic emissions being released into the atmosphere and more depletion of resources. It is estimated that over the next century this high rate of consumption will be majorly responsible for the emission of CO₂ and other gases that cause global warming through greenhouse effect. It is, therefore, now the responsibility of every country in the world to improve the quality of their sources of energy in order to reduce CO₂ emissions and oil dependency. The utilization of waste heat by method of heat recovery coupled with ORC based renewable energy conversion system for multiple effect like combined cooling-heating and power. The ORC applies the principle of the steam Rankine cycle but uses an organic working fluid, with low boiling point, instead of steam to recover heat from a lower temperature source. ORC is a promising technology for the conversion of these low temperature sources to power. This paper is concerned with the thermodynamic study, through analysis of performance parameters, of combined cooling, heating and power generation system with the source of energy for the system being the condenser heat recovered from 1MW thermal power plant. The R-134a working fluids based Organic Rankine Cycle (ORC) is introducing in proposed thermodynamic analysis and the provision of parabolic trough collector is recommended for solar heating purpose. The analysis of the system show thermal efficiency and multiple effect (Heating-Cooling and Power) trough heat recovery of

the plant, the process heat obtained and the cooling effect achieved in the case of solar integrated system as

well as no solar integrated system. The above stated improvements achieved are observed to be 30% to 40% more in case of solar integrated system than in case of non- solar integrated system.

Keywords: Organic Rankine Cycle, Solar Energy, Process Heat, Cooling Effect, Expander work

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Comparison of HFO refrigerants in cascade vapor compression refrigeration systems for low temperature applications

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Abstract: Due to the harmful effects of CFC and HCFC refrigerants on the environment, HFO refrigerants have used as alternative refrigerants for replacing HFC and HCFC refrigerants for different applications because of their zero ODP and very low GWP for energetic, security and environmental reasons. This paper presents comparison of three vapour compression cascade refrigeration systems using thermodynamic analysis. Numerical computations of several cascade systems have been carried out for above systems different two-stage cascading using HFO-1234yf refrigerant in low-temperature circuit, and HFO refrigerants in high-temperature circuit respectively. The operating parameters considered in this study include condensing and evaporating temperatures in high-temperature circuit, temperature difference in the cascade heat exchanger, and evaporating and condensing temperatures in the low-temperature circuit. The results obtained show that a vapour compression cascade refrigeration system using HFO-1234ze refrigerant in the high temperature circuit and HFO1234yf refrigerants in the low temperature circuit can be used for replacing HFO1234yf refrigerants in high temperature circuit and R134a in the low temperature circuit. Although HFO1234ze refrigerant in high temperature circuit and R134a in the low temperature circuit gives better (around 5% to 10% higher) exergetic performance than HFO1234ze refrigerant in high temperature circuit and R1234yf in the low temperature circuit. The effect of ammonia (R717), propane (R290), butane (R600), R404A, R410A and R134a, R152a, R407c, R245fa, R236fa, R227ea, R32, R123, R125 refrigerants in high temperature circuit and R744 in the low temperature circuit have also been analyzed.

Keywords: Two stage Cascade Refrigeration systems, HFO Refrigerants, Energy-Exergetic Analysis

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A structural equation model of circular economy factors to enhance supply chain performance

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Abstract: This research proposes conceptual and theoretical frameworks that empirically investigate the relationship between the key factors in circular economy and supply chain performance using various hypotheses. Factors are taken by doing a strong literature review of the related research papers. For the testing of the hypotheses, partial least square path modeling (PLS-PM) is used which is a structural equation modeling technique that accumulates both measurement model and structural model into a concurrent statistical test. Indicators are highly co-related and interchangeable; hence they are taken reflective in nature. Outer loadings, composite reliability, average variance extracted and its square root are being examined and reported. Here, data was collected through five-point likert scale questionnaires. For cleaning of the data, Rstudio is used with SmartPLS which is one of the highly recommended software applications for PLS-PM. Finally, after running the model result shows, which are the key factors that potentially affect the supply chain performance with circular economy.

Keywords: Structural equation modeling, PLS-PM, Circular economy, Likert Scale.

ICARI-ME-19-01-11

Suitable selection of napkins in Hotel industry for sustainable development

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Abstract: This paper deals with the greenhouse gases (GHG) estimated emission from the napkins used in a Hotel Industry along with the selection of transportation mode vehicle (diesel or petrol vehicle). This study helps us to find whether a reusable or disposable napkin should be used to make a lesser GHG impact on environment. In the present scenario, most hotels are using paper napkins because they are light weighted, cheap and hygienic. The fact, that the relevant data is scattered, and is not available in literature and databases, compelled the data, to be acquired from various sources like journal articles and online blogs with few assumptions. Some critical data that has been collected is mainly from U.S and may vary when applied in India. A hypothetical assumption is used to derive the final conclusion. Cost is calculated for both the napkins associated with their mode of transportation per year. Finally, this paper suggests that reusable napkins should be used to deplete the rate of GHG emission.

Keywords: Carbon footprint, GHG emission, Sustainable Development, Napkin.

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Numerical Analysis of Industrial Used Counter Flow Shower Cooling Tower for Different Inlet Water to Air Mass Flow Ratio

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Abstract: This research deals with three dimensional (3-D) computational fluid dynamics (CFD) investigation of induced draft counter flow shower cooling tower (SCT). To cool the hot water in industries SCT can be used. The efficiency of conventional cooling tower (CCT) was drop due to decomposition of salt on its fills; also the changing and washing of fills are not easy. Therefore, a new type of tower called SCT can be used where fills removed totally, and the smaller size water drops used for energy transfer between air and water. The experimental data obtained from SCT which developed in lab are used to validate the CFD model of SCT. Solid work software used to make the geometry of SCT and Ansys Fluent software used for analysis. Inlet water to air mass flow ratio (RLG) varies from 0.5 to 2.0 along with other constant inlet parameters. Results show that exit air dry bulb temperature (DBT), air specific humidity, water droplets temperature, total exergy of system and second law efficiency (SLE) increase with increasing the inlet RLG. Results also show that thermalefficiency of SCT decreases with increasing the inlet RLG.

Key words: SCT; RLG; SLE; Ansys; Fluent.

ICARI-ME-19-01-13

Numerical Analysis of Effect of Cooling Fluid and its Blowing Ratio on Gas Turbine Blade Cooling

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Abstract: Gas turbines are now a days, being employed for both power generation and propulsion. Thus, improvement in the efficiency of gas turbines is an indispensable area of research. Increasing the inlet temperature of the turbine is the first approach towards increasing the efficiency. However, this increment in temperature can cause thermal and structural failure of turbine blades. The failure can be avoided using two methods; firstly, materials that can sustain such high working temperature without substantial failure can be used and secondly, we can bring down the temperature of blade by cooling techniques. As for the material consideration, an almost saturation point has been reached regarding the development of new and advanced materials of desired quality. So, employment of different cooling techniques for blades is a very viable method. In this project, we will be studying and analyzing the Film Cooling technique, which is a type of surface cooling technique. The aim is to study the cooling effects of atmospheric air and steam and compare them. The analysis is done using Ansys Fluent. Three different fluids, Steam (493 K), Atmospheric air (310 K) and Cooled Air (277 K) are used for same turbine inlet parameters (Working Fluid velocity 75 m/s and temperature 1473 K) and their cooling effects are studied and compared at different blowing ratios (for coolant inlet velocities 6 m/s, 11 m/s, 16 m/s, 21 m/s and 26 m/s). The results shows cooling effect increases with the blowing ratio, but blowing ratio is to be kept moderate. Too low won't provide enough cooling. Too high ratio leads to jet lift and flow reversal which cause degradation of streamlines and reduction in cooling efficiency.

Key words: Ansys; Fluent; Air; Fluid; Film.

ICARI-ME-19-01-14

Design and Manufacturing of Piston Assembly

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Abstract: The optimum performance of the internal combustion engine is achieved when there is proper sealing between piston rings and cylinder. This is an important condition for the internal combustion engine to maintain efficient combustion. This in turn reduces fuel combustion and increases power output. The main focus of authors were on the effect of the piston ring end gap and axial ring groove clearance on the combustion. In this paper Authors have designed a piston of 4-stroke spark ignition engine. The design procedure involves calculation of various piston parameters using analytical method. The constraint of maximum power and mechanical load were taken into consideration. Their combined effect taken into consideration while determining various dimensions of piston assembly. Analyses of various forces acting on piston assembly were studied in detail. Dimension obtain are utilized for manufacturing piston assembly.

Key words: - Piston, Piston assembly, Piston Ring, Piston Pin

Electromagnetic Braking System in Traffic Volume on Roads

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Abstract : There is drastic increase in traffic volume on roads. It becomes mandatory for all medium to heavy vehicles to have very effective braking systems. Which help in avoiding accidents. Authors have tried to design and develop a new generation braking system. They have done detailed analysis of the ELECTRO MAGNETIC BRAKING system. It works on the principle of eddy currents. This system has merits and demerits over conventional braking systems. According to proposed new generation design of braking system. It helps to overcome the demerits of conventional braking system. The merits of existing braking systems greatly utilized as well. The brake system layout configuration has been designed in such a way that the response time meets the vehicle safety standard regulations. It has been shown that the proposed ELECTRO MAGNETIC BRAKING system operate with the least effort as compared with other braking system. Hence the driver is able to stop the vehicle within the minimum possible distance without losing control.

Keywords: Eddy current, response time, electromagnet, Braking.

Preventive and Predictive Maintenance of Automobile Testing Plant

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Abstract: It is important to correctly schedule the Preventive & Predictive Maintenance to reduce the system failures and corrective maintenance related to it. The availability of the machines and equipments is the most important factor and is always considered in calculations. A properly scheduled plan reduces the breakdown frequency and expenses related to it. Machine reliability & Uptime increases. Market and Brand Value of the Company increases which is an important factor for every company. A higher failure rate of the machine would increase the chances of the machine's failure resulting in the reduction of the machine's availability which indicates the need of preventive & predictive maintenance to be performed on the Testing equipments. It also contributes to revenue saving.

The confidence level of the operator working on the machine, increases. The operator should be aware of the correct methods of Preventive & Predictive maintenance as it is critical for the Machine life. Most industrial maintenance roadmaps comprise trends associated with consistent data collection, wireless devices, data standards, deployment of new sensor technologies, improved security, as well as the use of NoSQL databases for maintenance data management. Maintenance concepts have also evolved over time. As resources are becoming scarcer and operational costs are under tight scrutiny because of competition, improving the OEE and reducing maintenance costs is becoming key to successful operations. Plant managers are fully aware of the need to improve OEE, yet the immediate costs are still very high. In this context, demonstrating short-term ROI (Return on Investment) is still one of the main challenges that lies ahead. Trends are showing an increasing number of companies moving from curative to predictive maintenance. More and more organizations are increasing automation, adding new technologies, and implementing new management solutions because they know that with the results, they'll be better able to deliver in their markets. In addition to helping prevent downtime, a PDM approach can better identify true maintenance needs. This can assist in making sure that you are targeting personnel deployment, maintenance activities, and maintenance dollars where they are needed most. Predictive maintenance can be especially useful in industries where the uptime of critical assets drives the bottom line. This includes large, heavy equipment in oil and gas, and mining operations, as well as critical machines in continuous-manufacturing operations. Predictive maintenance also can be valuable in operations that experience high maintenance costs. At present times, there is a lot of competition between companies in the market largely competing for the customer image and that is the reason that each and every company in order to fulfill their customer's needs, they would have to adopt Predictive maintenance strategically

Keywords: Maintenance, preventive, breakdown, industry

Generation Scheduling With Renewable Energy Sources an Improved Firefly Optimization Algorithm

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Abstract: Many optimization methods are employed in power system scheduling of generating units. Here in this paper firefly algorithm is proposed for solving the generation scheduling (GS) problem to obtain optimal solution in power systems by considering the reserve requirement, wind power availability constraints, load balance, equality and inequality constraints in wind thermal coordination. The firefly algorithm is a new meta-heuristic and swarm intelligence based on the swarming behavior of fish and bird in nature. The proposed firefly algorithm method is applied to a different test system holds 30 conventional units and 4 wind farms. The performance of proposed FFO is found for the test system by comparing the results of it with different trails and various iterations among five different populations say 10, 20, 30, 40 and 50. Computation of the solution for different populations in the system reveal that the best schedules attained by applying the firefly algorithm method. It also shows that as population size decreases the total cost value is also decreasing. The performance of FFO algorithm is efficiently proved by comparing the result obtained by FFO with the particle swarm optimization method (PSO).

Keywords: PSO, FFO Scheduling, Energy

Applicability of Quality Principles for Valve Sourcing and Expediting – The Indian Valve Sourcing and Expediting Series

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Abstract: Sourcing and expediting activities are technical twins and the activities require high level of discipline and technical excellence. Valve sourcing offices are blooming faster in India and they are either affiliated to a Parent Organization overseas or independent. Independent Valve Sourcing Offices work in collaboration with regional valve manufacturers and with Overseas Valve Manufacturers and bridge the Supply Chain gap between them. Quality Principles are necessary to maximize the performance of sourcing and expediting teams. ISO 9001 provides guidelines to practice quality management system and is also applicable to sourcing and expediting activities as well. Based on ISO 9001 and several other quality principles, this article provides guidelines to efficiently operate a sourcing and expediting office. Real time guidelines to operate principles such as KANBAN, 5S, 8D, FMEA, Statistical Quality Control have been presented in this research article and sufficient examples have been provided. This article will be an eye-opening manual to maximize the performance of Valve Sourcing and expediting team.

Keywords: Sourcing, Expediting, KANBAN, Statistical Quality Control, FMEA

Design and Implementation of Actuating Mechanism in a RC Car For Robosoccer

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Abstract: Rob soccer is an event in which robot-controlled cars are used to play soccer using wired or wireless connections. Proper handling and the movement of the ball along with some kind of a hitting mechanism are factors on which rob soccer greatly depends. Also many attempts were made by the teams to have a shield to tackle and control the ball movement. This paper focuses on the design considerations of an actuating mechanism having the ability to hit the ball with great force in the quickest possible time. In this actuating mechanism, spring mass system is used. The energy is supplied to a dc motor which rotates to stretch the slider having compressed spring. Now due to this compression of spring a restoring force is applied by the spring to get into released position. So due to this restoring force the slider is thrown forward to hit the ball. By this way the rotational kinetic energy by dc motor is converted to translational energy of the slider. This process is repeated to hit the slider multiple times in the forward direction. In this hitting mechanism the hitting plank first takes the back stroke and then it goes for forward stroke to hit the ball. Many ideas were put in this work to get a great robot for playing soccer. But the work is going on to make the robot more efficient and thus increases its performance.

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Performance improvement of Vapour Compression Refrigeration System (VCRS) by using Alternative Refrigerants with Nano Materials

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Abstract: Refrigeration systems have developed one of the most significant utilities for people's daily lives. Vapour compression refrigeration system worked on vapour compression cycle. Vapour compression refrigeration systems are frequently used in domestic, industrial & commercial applications. i.e. large-scale warehouses for chilled or frozen storage of foods, refrigerated trucks and railroad cars, Oil refineries, petrochemical and chemical processing plants, and natural gas processing plants. With the development and technological advances in the field of refrigeration new methods are established to increase the COP of the systems. Traditional methods for exchanging heat from the system involves increment in the surface area but this leads to the increase in the size of the system, so there was need of some efficient way that can improve the heat transfer. Therefore, improvement of thermal performances of vapour compression refrigeration systems are correspondingly important for higher refrigerating effect or reduced power consumption for same refrigerating effect. promising. Therefore, Nano refrigerants are expected to be the future refrigerants for improving thermal performances of vapour compression refrigeration systems. Numerous efforts have to be done to improve the performance of vapour compression refrigeration systems. In the various environmental agreement, more environmentally friendly refrigerants have been investigated in recent years. The application of Nano particles in refrigerants has been identified as a better way of enhancing the thermal performance of the vapour compression refrigeration system (VCRS) without modification the system design. When nano particles are dispersed in a refrigerant, they are regarded as nano refrigerants. The improvement in evaporator and condenser heat transfer coefficient are responsible for the enhancement of VCRS performance. The effect of nano particles (CuO, Al₂O₃, TiO₂) mixed in ecofriendly refrigerants

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(R134a, R407c, R404a etc.) on the first law efficiency in terms of coefficient of performance (COP), exergetic efficiency (second law efficiency) and system exergy destruction ratio (EDR) based on exergy of

fuel / exergy of product) using alternative refrigerants are discussed. It is shown that the application of Nano particles as additives in refrigerant and lubricant in VCRS is favourable and promising. Therefore, Nano refrigerants are expected to be the future refrigerants for improving thermal performances of vapour compression refrigeration systems.

Keywords: Thermodynamic performance, VCRS improvements, Nano materials, Eco-friendly Refrigerants.

ICARI-ME-19-01-21

Performance and emission characteristics of a diesel engine using rice bran oil methyl esters

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Abstract: The utilization of powers on the planet is expanding quickly and it influences the worldwide economy of the considerable number of nations so this factor constrained every one of the nations to locate the elective fuel to lessen and even supplant the use of oil. In this way utilization of biodiesel from non-consumable oil sources fills in as an option in contrast to this issue. In this exploration paper execution and discharges qualities of a diesel engine filled with rice wheat oil were assessed. B10 and B20 mixes of rice grain methyl esters were tried on the engine and it was reasoned that by using rice bran biodiesel BSFC increments and BTE diminishes. Emanation attributes additionally delineate enhancement other than NO_x exhalations.

Keywords: Rice bran, biodiesel, diesel, performance, emission.

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Performance and emission characteristics of a diesel engine fueled with blends of diesel and n-butanol

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Abstract: One of the strategies for diminishing the nitrogen oxides and smoke emanations from the fumes gas of diesel engine is to utilize powers containing an expanded portion of oxygen mixes. This can be accomplished by including oxygen mixes, as alcohols, to a standard diesel fuel including, for instance, ethanol, methanol and nbutanol. Because of various favorable circumstances over ethanol and methanol, n-butanol is quite compelling. In this investigation, execution and outflow qualities of a diesel engine energized with the blends of diesel and n-butanol were tried and it was reasoned that BSFC increments while BTE diminishes with biodiesel mixes in correlation with standard diesel. Addition in HC discharges are watched and tumble off in CO, NO_x and smoke emanations are accounted for.

Keywords: n-butanol, diesel, performance, emission.

Analysis of growing trend of Electrical vehicles and Transportation System in Delhi using System Dynamics

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Abstract: Delhi is facing worst pollution scenario and traffic clogging all around. Vehicular pollution is one of the major constituent of this pollution. The center and state government is taking many steps to reduce pollution level (PM2.5 & PM10) within prescribed limit. This research mainly focuses on analyzing increasing demand of replacement of old conventional (petrol/ diesel engine) vehicles with Electrical Vehicles (EVs) and alternatives. EVs will be helpful in reducing pollution level especially Green House Gases (GHGs) and particulate matters (PM2.5 & PM10). The simulation model is prepared for analysis of increasing pollution level and traffic clog in Delhi using system dynamics modelling software for the coming 25 years. On the basis of quantitative analysis a causal loop diagram is made for subjective examination to control the quantity of aggregate private vehicles and build the level of electrical vehicles (EVs). This study/ analysis may be helpful in determining future pattern about private vehicles and concentrate the ramifications of various strategies by the State and Center government in Delhi/NCR.

Key words: System Dynamics; Electric Vehicle; Air pollution; Traffic clog

Biofuel production technology from BioEnergy Crop-Algae BioFuel

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Abstract: The constantly rising population and heavy load on agriculture lands for increasing commercial crops the large scale and economically viable biofuel production on land seems a challenge to meet the huge and increasing global energy demand. The use of bioenergy crops for generating biofuels is a recent concept and full of potentials. Algae shows promising results in becoming source for biofuel. It is considered as sustainable, renewable and effective biomass and bio-fuels and to fulfil the high biomass demands for biofuel production, it is of pivotal importance to develop feasible technologies to enable economic, efficient and high density cultivation of algae. Algae can be cultivated in either open or closed systems in the presence of nutrients and light intensity. Algal biomass is used in the production of biofuels like biodiesel, bioethanol, bio-butanol and bio-hydrogen etc.

Keywords: Depletion of Fossil Fuels, Renewable, Algae, Biofuel, Biomass.

Reduction of Specific Fuel Consumption in Compression Ignition Engine by Using Modified Surface of PistonRings

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Abstract: In the present era, fuel prices are rising daily basis. Also there is fuel crisis which leads to design and development of compression ignition engines. Keeping in mind energy/fuel reserves and environmental issues, researchers are investigating various moving interfaces in the compression ignition engines. Their focus is to improve performance with respect to tribological perspective. Researchers trying to reduce friction at the interface of cylinder liner and piston rings in compression ignition engine significantly. They have succeeded in reducing the fuel consumption, lubricating oil consumption and in addition to increase in the engine's power output. Thus the role played by piston ring surface profile is very important. In this paper authors report the results of experiments performed on single cylinder, compression ignition engine pertaining to the tribological performance of modified surface piston rings. A compression ignition engine is run with the conventional and modified surface piston rings. It was observed from the experimental studies that surface modified piston rings results in considerable savings in fuel consumption.

Keywords: Specific Fuel Consumption, Cylinder Liner, Piston Ring, Piston.

Scope of Eco-friendly Refrigeration Systems for Industrial Waste Heat Recovery

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Abstract: The power consumption by captive industries is increasing day by day and a major part of this power is invested in fulfilling the cooling requirement. The conventional refrigeration systems are used for achieving these cooling requirements, which results in emission of gases like CFCs and HFCs, playing a major role in Global warming and Ozone layer depletion. The alternative ways of these processes like Vapor adsorption refrigeration system and Vapor absorption refrigeration system can be proved to be advantageous. These eco-friendly ways of cooling techniques highlights the technical aspects of this green refrigeration with the employment of low to high grade energy as waste heat utilization and opportunities of solar thermal energy systems integration. This paper aims to demonstrate the new trends of refrigerants with adaptation of refrigeration systems which have no Ozone depletion potential as well as very minimal Global warming potential.

Keywords: Ozone layer depletion, Global warming potential, Vapor adsorption refrigeration system, Vapor absorption refrigeration system.

To Study the Design of Solar Air Heater Systems and their Applications

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Abstract: Given that the future of our planet is intricately entwined with the future choices of energy, effective exploitation of non-conventional energy sources is becoming increasingly essential for modern world as fossil fuels are hazardous to environment and cannot sustain supply for long time as they are not renewable. Moreover, demand of energy is increasing rapidly. In this scenario, solar energy is being seen as potential viable resource for ever increasing hunger of the energy for the development of nation and by and large globe.

The fact that countries like Germany and Japan are global leaders in the use of solar energy, meeting 27% and 10% of their energy needs through solar energy despite lying in temperate climatic zones, while India being a tropical country blessed with high solar insolation meets only 1-2% of its energy requirement via solar energy shows that a large portion of solar energy remains untapped.

In this dissertation, effort has been made to demonstrate this reality. Furthermore, numerous new designs of Solar Air Heater are emerging in various aspects. Different types of such Solar Air Collectors and driers have been demonstrated along with the process for design and development of a flat plate solar air collector with the requisite thermodynamic and mathematical analysis.

The application of hot air produced by the Solar Air Heater Systems in Solar Air Dryers is studied in detail. These include drying of fruit, timber, cash crops, chillies, pepper, cardamom etc. The applications also extend to include Solar Space Heating, Solar Induced Ventilation.

Keywords: Solar energy, air heater, dryer

Simulation modeling of ash carriage system of a thermal power plant

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Abstract: The present paper deals with the opportunities for the modeling of ash carriage system of a thermal power plant by making the performance evaluation using probabilistic approach. The paper also discusses decision support system for ash carriage unit of a thermal power plant. The present system of thermal plant under study consists of five subsystems with three possible states: full working, reduced capacity working and failed. Failure and repair rates for all the subsystems are assumed to be constant. Formulation of the problem is carried out using Markov Birth-Death process using probabilistic approach and a transition diagram represents the operational behaviour of the system. A probabilistic model has been developed, considering some assumptions. Data in feasible range are selected from a survey of thermal plant and the effect of each subsystem on the system availability is tabulated in the form of availability matrices, which provides various performance/availability levels for different combinations of failure and repair rates of all subsystems. Based upon various availability values obtained in availability matrices and graphs of failure/repair rates of different subsystems, performance and optimum values of failure/repair rates for maximum availability, of each subsystem is analysed and then maintenance priorities are decided for all subsystems.

Keywords: Availability matrices, Decision Support System, Probabilistic approach, Transition diagram.

Sustainable supplier selection for new product development: A multi-objective framework

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Abstract: Availability of emerging technology, globalization scenario, use of information and communication technology (ICT), and decreasing transportation cost (logistic optimal fleet selection) are responsible for rapid variation in product demand and these demands can be handled by using the concept of new product development (NPD) under sustainable supply chain (SSC) environment. In today's manufacturing environment, it is a challenging task for practitioners and researchers, how to handle new product development (NPD) in a sustainable supply chain environment. In general, economic, social, and environmental are three aspects of sustainability. Individual aspect of SSC issues for NPD has been found in the literature but integration of all the three aspects for NPD is an emerging topic. Therefore, in this paper, we tried to provide a holistic approach for integrating SSC concerns with NPD.

Keywords: Sustainable supplier selection, new product development, Multi criteria decision making model, Meta heuristic algorithm, Fuzzy logic.

Manufacturing of Fiber Reinforced Composites using Reinforcement Techniques

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Abstract: Fiber composites are formed by sandwiching different layers of dry fiber using wet bonding agent (resin) to give a product with better properties. This is done without affecting the manufacturing cost and gives better strength in lesser weight. The aim of this paper is to reduce weight and gain strength. Composite material are becoming more common these days offering better qualities than traditional materials. The industry these days are exploring use of fiber composites on a large scale and its application is everywhere. Fiber composites are used in indoor and outdoor furniture, toys, instruments, aviation, marine industries and many more. These are advantageous as they are ecofriendly, heat resistant and offers high stiffness to weight ratio. In this paper the author focuses on different manufacturing processes and reinforcements available in the industry. This is done without affecting the manufacturing cost and gives better strength in lesser weight. This will give the basic knowledge to even a beginner to design and fabricate by his own. Paper first highlights different kind of fibers as well as bonding agents available in the market and gives a clear understanding of which combination should be selected based on the application. Composite market is widening day by day and offers great future ahead.

Keywords: Fiber, composites, reinforcement, manufacturing

Performance and emission characteristics of a dual fuel engine fueled with diesel and biogas

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Abstract: Exploratory examination has been completed to use biogas as an elective wellspring of vitality in pressure start (CI) engine under dual fuel operational mode. Biogas was accepted into the gulf complex at various stream rates alongside natural air through channel complex and diesel was infused as a pilot fuel to start burning under double fuel mode. The engine execution and emanation qualities of dual fuel operational mode were broke down at various biogas stream rates and contrasted and benchmark regular diesel fuel. The lower brake thermal efficiency (BTE) and higher brake-specific fuel consumption (BSEC) were seen with biogas-diesel fuel under dual fuel mode when contrasted and perfect diesel task. Test outcomes demonstrated diminished NO_x outflows and smoke obscurity level in the fumes tailpipe emanations. Be that as it may, higher hydrocarbon (HC) and carbon monoxide (CO) emanations were seen under double fuel mode at full engine loads when contrasted and pattern fossil petro-diesel. Henceforth, the utilization of minimal effort vaporous fuel, for example, biogas would be a monetarily reasonable suggestion to address the present and future issues of vitality shortage and related ecological concerns.

Keywords: biogas, diesel, performance, emission.

Performance improvements of low cost porous and non-porous absorber solar air / Water heating collectors for rural applications

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Abstract: The applications of porous materials in the construction of the solar energy plastic collectors are well known. The heat transferred in the porous absorber is subjected to the solar radiation is highly effective in the heating of working air and improving thermal efficiency. For porous air heating plastic collectors, the blackened textile polyester cloth of porous materials having longer life in comparison to the ordinary cloth and very light in weight has been used as solar radiation absorber for reducing heat losses to the environment. In this system, The glass covers of air heaters are replaced by low cost thermal conductivity polythene plastic covers. These combinations are cost effective and very light in weight and required very low fan power for blowing the air through air heating collectors. Two porous absorber solar systems were chosen using plastic collectors and for experimental study are flexible type in which a porous black textile cloth acts as a porous absorber another non porous absorber system. The edges of absorber are attached to two transparent plastic sheet of ultraviolet stabilized polyvinyl chloride (PVC) covering it from the both sides and dimensionless thermal steady state analysis to find out the effect of various boundary conditions applicable in the analysis of a matrix air heaters made of plastic films with textile cloth of 100% polyester have been proposed for porous absorber and compared thermal performance in terms of rise in the temperature difference and thermal efficiency and also compared with the ratio of outlet air temperature to the inlet air temperature for two mass flow rates and observed optimum thickness of matrix absorber as 7.2mm. This periodic thermal model for finding actual thermal performance of low cost plastic collectors under varying metrological conditions validates the experimental results and closed agreement between theoretical results and experimental measurements have been observed which proves the validity of proposed thermal model for low temperature porous air heating plastic collectors for rural domestic applications specially fruits and vegetable drying applications at the minimum cost.

Key Words: Low cost air/water heating systems, Thermal model Modelling, Porous & Non porous collectors.

Theoretical and Experimental Performances of Low Cost Plastic Collectors for Rural Applications

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Abstract: Energy is a critical input in the national development process. In fact, it is the basic requirement for human life, agriculture, industry, transportation, communication and many other economic activities of the present civilization. In the present day, the depleting fossil fuels in the various countries, the terms of energy crises underlines the need of paying serious attention to the effective /efficient utilization of existing conventional and non-conventional energy sources in terms of energy conservation through effective management for maximum agricultural production. In this paper, experimental studies on solar air/water heating cum storage systems using low cost plastic films have been carried out and periodic thermal model has been proposed. Explicit expressions have been obtained for air and absorber temperatures. Using the steady state analytical solutions for temperature distributions in the porous collectors and considered the two cases of (i) air flow from top to bottom and (ii) bottom to top side and found that, when outlet hot air comes in contact with cover at the top side of the porous absorber air heating collector, loses significantly heat energy to the ambient air which causes the decreasing thermal efficiency around 15%. The utility of the thermal model was established by conducting experiments on various systems for several days. Closed agreement between theoretical and experimental results validates the proposed methodology.

Key Words: Plastic technology, flow through the porous medium, Solar porous & non porous air heaters, thermal energy storage Air systems.

Applicability of Finite Element Method for Prediction of Stress Concentration on Welded Joints with Defects

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Abstract: Uncertainty in manufacturing process, methodologies and environmental factors will lead to occurrence of flaws in the welded structures. Certain critical weld defects like lack of fusion, slag inclusion and cold cracks embedded during welding will impact the structural life of the structures. Planar defects have to be considered seriously than volumetric defects. An attempt is made to study the effect of weld defects on the structural integrity of components. The experimentation was conducted on the butt joint specimen and it is on par with numerical results. The present work involves the applicability of the finite element method to predict the stress on welding joints with defects using a finite element software and compare results with weldments with zero defects. The defects are simulated experimentally and similar defects are measured using radiography and the same in modelled numerically to predict the stress induced in specimens.

Keywords: welding, defects, finite element method, stress analysis, porosity, cold cracks

Numerical Analysis of Hyperloop Transportation System

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Abstract: As the existing mode of transport are air, water, road and rail. These available modes of transport are either slow or expensive or both, so hyperloop vehicle a new type of transportation system used which is quick and cheap. The hyperloop vehicle is an ultra-high speed ground transportation system. A low pressure tube or capsule is used for transport the hyperloop. The solidwork is used to develop two 3-D models of hyperloop vehicle and then it is imported to the Ansys Fluent for the Computational Fluid Dynamic (CFD) Analysis. In this mode of transportation, the vehicle travel at high speed through a low pressure tunnel in order to minimize the aerodynamic drag. The results shows on comparing both the designs of hyperloop model, coefficient of drag is reduce from 1.72 to 1.21. So, efficiency and speed of the hyperloop vehicle is increase with decreasing the coefficient of drag.

Keywords: Hyperloop, CFD Analysis, aerodynamic drag, drag pressure, pod.

Role of social media in forecasting sales and demand distribution

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Abstract: There is phenomenal growth in online e-commerce and B2C (business to customer) activity due to increased access of internet facility and online social media to the masses. Earlier, sales forecasting and demand distribution are often conceived in terms of longer-run trends based on weekly, monthly or even quarterly data, even in markets with rapidly changing customer demand like fashion industry. Customer demand is changing fast in almost every area and managers have to focus on short-run models of demand distribution and sales forecasting at the product level due to the shorter product lifecycle. This paper focuses on roles of social media and online customer reviews on forecasting sales and demand distribution in a short run model. A method to visualize the demand distributional characteristics and sales forecasting for a shorter run is developed, and it was found that big data streams of customer reviews available on social media and on websites contain useful information for better sales nowcasting and also better understanding of the influence of online sentiment on sales. It will help managers to take better decisions related to inventory management, capacity utilization, and lead and lag times in supply-chain operations.

Keywords: Big Data, Nowcasting, Demand Distribution, Mass Customization.

Study and Analysis of Tribological Behaviour of Coated and Uncoated Tool Material using a Pin on Disc Testing Rig

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Abstract:Investigation of the tri-biological behavior of an uncoated and coated tool material against an uncoated Steel Disc (EN-31) has been done by dry sliding at room temperature. Residual Stress, Friction Coefficient and Wear, were investigated. The tests were carried out on a pin-on-disc testing rig. Analysis of the characteristics were performed and were correlated with the wear and friction coefficient behavior of the tool material. The weight percentage of the elements in base tool material were found using energy dispersive X-ray analysis. In the early stage of transient wear, Lower coefficients ratio was generally obtained. This work has provided a significant insight into the discrepancy of the wear coefficient and friction coefficient values obtained by the pin-on-disc testing method.

Keywords: Tribology, material, pin-on-disc, wear

Effect of Reciprocating Frequency and Load on Wear Behavior of Mo blend Composite Coating

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Abstract: Efficiency and performance are two critical characteristics of the internal combustion engine. The power generating component is required to be efficient so as to increase the overall performance of the vehicle and to make maximum use of the energy. The present study mainly focused on the development of Mo blend composite coating on cast iron substrate. The study shows that Mo blend composite coating enhanced tribological properties. Mo blend composite coating was fabricated with the help of hydrogen and argon gas by using atmospheric plasma spray coating technique. Mo blend composite coating was successfully deposited on cast iron substrate. Microhardness, surface roughness and specific wear rate of the developed coating are analysed in the present research. Mo coating shows increase in wear debris (coarse and fine) and specific wear rate as load and frequency was increased from 10N+ 10Hz to 40N+20Hz. The increase in specific wear rate may be attribute due to tribofilm formation on Mo blend composite coating.

Keywords: Wear, engine, composite, coating

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Simulation and validation of three solar thermal photo-voltaic systems for typical climatic conditions

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Abstract: Solar power in India has reached a capacity of 20GW in Feb, 2018 and with a target of 100 GW of solar power by 2022. Hence the upcoming years are not only important for the development of the country but also creating opportunities and awareness within the society. Most of our industrial processes and buildings need energy including both heat and electricity, and both of them can be provided using hybrid solar photovoltaic/thermal system. Solar thermal and photovoltaic systems absorb energy from solar radiation but due to limited availability of area, installing separate system is expensive and land consuming. Hence a combined system for improved utilization of solar radiation is suitable, less expensive and consumes less area for installation. In this paper, simulation models of the solar thermal collector, photovoltaic system and photovoltaic thermal system have been presented and results of simulated model were validated with the performance data of the three solar systems.

Keywords: Photo voltaic, solar power, energy

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Analytical study of variation of stresses and displacement for different types of contact problems: A Review

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Abstract: Contact between two bodies is seen in several practical applications; metal forming problem, contacts between roads and tires, contacts between two gears, contacts between bearings etc. In this research paper contact between two cylinders and two spheres are separately analyzed. The variation of stresses such as principal stresses, shear stresses, Von Mises stress due to contact have been studied. The location of maximum value of these stresses are also discussed in this research paper. In addition to this, the changes of principal stresses, shear stresses and Von Mises stress due to different material combinations are analyzed. Also, variation of stresses due to effect of centre distance of two different curve surface, geometry and material combination have been analyzed.

Keywords: contact problems, Von Mises stress, centre distance, contact pressure.

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Comparison of Finite Element Solutions and Analytical solutions of a Thin and Thick Cylinder subjected to internal pressure

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Abstract: Thin and thick cylinders are mostly used as pressure vessels for many practical applications like boiler shell, tank etc. During design of pressure vessel, it is required to know variation of principal stresses such as hoop stresses, radial stresses and longitudinal stresses. In this research paper, the variation of these stresses are obtained analytically. This solution is validated by use of numerical solution. Here, finite element method is used for solution. The commercial software Abaqus of version 6.12 is used for evaluation of stresses developed in thin and thick cylinder due to internal pressure. In this problem, two types of elements are used such as shell elements and solid elements and found that shell elements (S4R) are suitable for thin cylinders whereas solid elements (C3D8) are suitable thick cylinders.

Keywords: pressure vessels, Von Mises stress, hoop stress, longitudinal stress, radial stress, abaqus 6.12.

Flexibility evaluation of auto-component suppliers using AHP and TOPSIS

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Abstract: The aim of the paper is to compare the flexibility of auto-component suppliers. In this study, some important variables of flexibility such as volume flexibility, design flexibility, transportation flexibility, lead time flexibility etc. have been identified through the literature review. These variables are considered as the criteria to evaluate the flexibility of the suppliers. Suppliers are rated with respect to these variables. The importance rating or the priority of these variables have been decided using Analytic Hierarchy Process (AHP) and the rank of the suppliers are determined using Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS). It has been observed through the analysis that volume and design flexibility are the most important variables for the flexibility of an organization. The suppliers must have the ability to change the design of the component as per requirement of the buyers and at the same time, they must be able to meet the fluctuating demand of the market for the success of the supply chain.

Keywords: Flexibility, rapid prototyping, agility, supply chains.

Study of Mechanical Property of Biomaterials (Bones)

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Abstract: The shape, support and kinematics of motion to the human body is provided by the skeleton, which is an assemblage of several joints, connecting various bones, with each other and ultimately providing a structural shape to the body. Along with facilitating kinematic motion and stability to the body, the skeleton also sustains all external forces applied over it while interacting with the other bodies. With this viewpoint the assessment of the mechanical properties characteristics of bones become very important. Different types of loadings will be causing different kind of internal resistance resulting in specific type of stress. For this purpose, the study of various mechanical properties become very important in case of the biomaterials like Bone. Mechanical properties of bone may be ascertained, as it is done with metallic materials. Various mechanical properties like strength, compressive strength, toughness and hardness have specific role to play. Any object may hurt the bone if applied inappropriately. So, mechanical behavior of the bone needs to be ascertained, in order to ensure its safety from any such situation. In this paper this important aspects of bone has been studied, and propositions have been made so that bone may be protected under any such condition.

Keywords: Mechanical Property, Biomaterial, Hardness, Kinematics, Stress.

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R1234ze: A Promising Refrigerant with Environmental Prospects

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Abstract: The average Global surface temperatures has increased in the last century. For controlling this phenomenon, new regulations for putting ban or taxing greenhouse gas fluids (HFC among them) have been approved. HFO fluids and most used HFCs as refrigerants in HVAC systems possess similar thermo physical properties. Considering these facts one of the most promising refrigerant may be R1234ze (E). This refrigerant is having good environmental properties and can be used in the most of the HVAC applications, in pure or by mixing with HFC or natural refrigerants. This generates a need for the investigation of zero ozone depletion potential (ODP) refrigerants or refrigerant blends. The apparent anomalous behaviour of R1234ze has been shown to be due to its very favourable physical and transport properties. As a HFC refrigerant, R410A requires the use of polyester oils (POE). It is non-flammable and non-toxic. The R410A system actually runs slightly cooler than a comparable R22 system due to the higher vapour heat capacity of the refrigerant. In this paper a study has been done on such issues by considering various Parameters of various thermodynamic properties like maximum discharge pressure, coefficient of performance, power consumption, heat rejection and mass flow rate.

Keywords: Refrigerant, Global Temperature, Non-Flammable, Non-Toxic.

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Theory of Constraints: a review and roadmap for robust Process**Design and simulation**

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Abstract: TOC considers a constraint to be a focusing point around which a business processes can be organized or improved. Process design deals with development and optimization of individual processes. Every business process has at least one constraint, which affect the performance and due to which its limit the business profit. Process design reflects the relative priority of the performance objectives – quality, speed, dependability, flexibility and cost. This paper suggests a roadmap for the process designing by considering the performance objectives and also checks its reliability.

Key words: Theory of Constraints (TOC), Process Designing, Reliability.

A Case Study of Salalah Liquidify Petroleum Gas

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Abstract: The study Salalah Liquidify Petroleum Gas (LPG) is to enhance the production of Natural Gas and to meet the country requirement as well as to export the maximum Gas through LNG to the Asian Country. Salalah LPG Extraction Project, which is to extract all of propane, butane and condensate associated with the natural gas pipeline from Salalah area, is likely to start actual production run sometime in 2019. One of the most ambitious projects in Dhofar, the Salalah LPG Project is the result of Oman Gas Company's (OGC) efforts to find ways for optimizing the added value of gas chain. Oman's electricity sector relies heavily on domestic natural gas to fuel electricity generation. The Authority for Electricity Regulation Oman (AER Oman) regulates the country's electricity and associated water sectors. Its primary functions include implementing general policy from the state, licensing, compliance, and coordination between the various ministries, organizations, and stakeholders in the sector. The Oman Power and Water Procurement Company (OPWP) is the planning body for power supplies in Oman, and the Oman Electricity Transmission Company (OETC) is in charge of the country's transmission networks.

Keywords: LPG, Salah, stakeholder, natural gas

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Performance evaluation of a diesel engine using biodiesel consisting of hemp and diesel

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Abstract: With the fossil fuels being consumed at a very high rate, research and evaluation of alternative fuels generated from renewable resources has become inevitable to save the deteriorating environment around us. Diesel engines are used in fields such as transportation and agriculture all around the world and biodiesels are a great alternative to diesel. Biodiesels generate considerably less pollutants and thus can be used in a far greater quantity than diesel without producing the degenerative effect that diesel produces on the environment. Hemp (typically found in northern hemisphere, it is a variety of cannabis sativa plant species that is grown specifically for the industrial uses of its derived products. It is one of the fastest growing plants and was one of the first plants to be spun into usable fibre 10,000 years ago.) is not widely cultivated in India and has an average yield of 500 kg per hectare which is considerably less than its yield in other countries such as Australia and Canada. Hemp oil was taken in various proportions and mixed with diesel to produce the optimum blend of the biodiesel for which the engine would produce the least amount of pollutants.

Keywords: Renewable, Biodiesel, Hemp, Fossil fuels & Optimization.

Theory of Constraints (ToC) approach for the analysis of Total Quality Management (TQM) factors on its performance

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Abstract: This study examines and analyzes the TQM factors which act as barrier and affects its performance. TQM view the organization as a collection of processes that must be continuously improved through utilization of the knowledge and experience of associates in all functions and at all levels. The industries must be more focused on understanding their own structure in terms of production/ service processes. Theory of Constraints (ToC) focuses on the weakest ring(s) in the chain to improve the performance of process systems. In this situation, ToC becomes an important problem structuring and solving methodology which changes the way of thinking of decision makers. This paper includes the extensive literature review on Theory of Constraints and adopted the same approach to analyze the performance of the Total Quality Management.

Key words: Performance measurement, Theory of constraints (ToC), TQM.

Design of Y-Type Dual Split Hydraulic Braking system

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Abstract: ATVs (All Terrain Vehicles) are used for multiple purposes such as recreation, motorsports or as commercial passenger vehicles. For such a wide range of customers of this product, occupant safety during dynamic conditions such as braking is a crucial need. The aim of this paper is to design a “Y-type” dual split hydraulic braking system for proper implementation in certain production based ATVs and other vehicles with similar specifications. Various calculative approaches were followed to implement this braking system, along with the individual designing and analysis of braking components. This braking system is capable of locking a minimum of three wheels during a single circuit failure. Hence the brake circuit design provides a much safer and a reliable method of locking the wheels during a single brake circuit failure by reducing the chances of vehicle skid considerably.

Keywords: Brake circuit design, all-terrain vehicles, locking, wheels

Recent trends in Industrial Design – An IPR perspective

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Abstract: The protection of industrial design is not only the products or articles of manufacture themselves, but rather the pattern, ornamentation, shape or configuration, design applications or embodiment, regardless of their artistic merits, that is the unique ideas or abstract concepts that trigger the design. With the increase in the distinct of design, the potency and prowess to sell the goods will increase. Also, it would become more vulnerable and prone to piracy by lurking unscrupulous predators. This paper focuses on the design protection which inevitably injects impetus and gives momentum to increased creativity in all sectors of the economy. And how it contributes to expanded commercial activities, and enhances a nation's export potential, hence returns on the fiscal to the maximum benefit of all its citizenry.

Key words:Industrial design, Intellectual Property Right, Patent.

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Tribological Analysis of a Cricket Ball With Respect to a Cricket Pitch

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Abstract: A cricket pitch is strip of compacted soil and a closely mown turf on which a bowler projects a ball. The surface has fundamental importance to the game and ground staff seek to ensure that the ball rebound to sufficient pace, bounce and consistency. The pitch has to remain in the best condition possible up to the required standard. The scientific understanding of the factors that contribute to wear of the pitch were considered by the scientist and still the work is being carried on it. The observation was carried over a period of two months six T-20 matches and recorded. The delivery point of 15 bowlers were measured as being fast and spin bowlers. The frictional force, specific wear rate and coefficient of friction were determined on the linear reciprocating tribometer following ASTM-G-115. The base was made of cricket pitch material and the pin base has white leather cricket ball based on number of overs bowled. The pitch sample was taken of dry and slow pitch. The estimated angle at which the ball strikes the pitch and the impact load acting on the ball during the contact was measured on the basis of height of the bowler and impact load. The specific wear rate and the coefficient of friction was found to be $8.4 \times 10^{-8} \text{ m}^3/\text{Nm}$ and between 0.02 - 0.03.

Key words: Cricket pitch, Leather ball, Tribometer, Coefficient of friction, Specific wear rate.

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Study and first law analysis of Gas Turbine-HRSG-ORC co-generation system with change in atmospheric temperature

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Abstract: Gas turbine cogeneration system integrated with heat recovery steam generator and organic Rankine cycle provides an effective measure of waste heat recovery from exhaust gasses of gas turbine. The numerous study conducted to understand the variation in the performance of the integrated system has been done and the variation of performance with parameters such as turbine inlet temperature, compression ratio mass flow rate etc. has been carried out. The present paper investigates the variation in the performance of the system with change in the surrounding temperature. The paper provides the detailed first law analysis of the system and compares the first law efficiency obtained at different surrounding temperature to justify the location of use of the integrated system.

Keywords: Gas turbine, Heat recovery steam generator, Organic Rankine cycle, first law efficiency.

Modelling of Linear and Dual Rate Spring and Their Comparative Analysis Using ANSYS

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Abstract: In automobile sector due to the demanding need of rapid innovation and tough competition, the old products are reengineered by new product. Regularly new innovations are carried out in suspension area of vehicles. In this research, linear rate spring and dual rate spring are compared and deciding factor is force to displacement ratio. Linear springs are helical coil springs that exert constant rate of force per degree of distance traveled. This means that the load applied to the spring will be proportional to the amount of distance it travels based on the spring rate of linear spring. Dual Rate Springs essentially provide the performance of an optimized stacked spring set-up, but in a single spring. The Dual Rate Spring combines a relatively low initial spring rate, designed to absorb minor undulations and increase grip with a precise transition point and transition range to a secondary higher spring rate. Spring geometry is modelled using SOLIDWORKS Software and their comparative analysis is carried out on ANSYS WORKBENCH Software. Finally, Dual Rate Spring is proved to be much better than Linear Rate Spring.

Keywords: Spring, stiffness, automobile, suspension

Exergetic Analysis of Single Stage Water – Lithium Bromide Vapour Absorption Refrigeration System and Its Performance Characteristics

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Abstract: In this study, a detailed energy and exergy analysis is carried out on a single effect absorption refrigeration system with LiBr/H₂O as the working fluid pair. The thermodynamic properties of water and LiBr/H₂O solution are obtained from the empirical equations, and from the first law analysis, the concentrations of the system for strong and weak solutions are calculated as 0.5492 and 0.6524, respectively. The coefficient of performance (COP) of the system is obtained 0.8336 which has been enhanced by the use of diffuse before absorption process as compared to normal single effect absorption refrigeration system with LiBr/H₂O.

A procedure is presented to perform the exergy analysis of absorption refrigeration systems. By the use of presented procedure, the input-output and destruction (irreversibility) of exergy for each component are determined. It is shown that the highest irreversibility took place in the condenser and the lowest one appears in the pump and expansion valve on solution side. The rate of exergy destruction of the condenser to the total exergy destruction is found 133KW. The main reason of the irreversibility on the condenser is the temperature difference between the heat source and the working fluid.

Keywords: Exergy analysis, thermodynamic, refrigeration, condenser

Current Scenario of Solid Waste Management in India

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Abstract: Metropolitan solid squander administration be a noteworthy ecological question for Indian country. Because of quick enlargement in urban areas, industrialize areas, and populace, the production speed of civil solid squander in Indian urban communities and villages is additionally expanded. Botch of metropolitan solid squanders be able to source antagonistic ecological effects, general wellbeing hazard, and another financial issue. This study displays a diagram of momentum position of solid squander administration in India which will be capable of facilitating the equipped specialists in the field of civil solid waste administration and analysis to get ready more effective plans.

India is one of the largest nation of the world concerning populace status and elements. The developing rate of a populace is an immediate factor in charge of the upgrade of metropolitan solid waste (MSW) generation. The fundamental target of this study was to discover the current MSW generation and the conceivable issues related to its administration in India. Here in India basic approach for waste administration is still informal. Indeed, even today, an extensive bit of solid waste is dumped aimlessly on edges of towns or urban communities with no earlier treatment. It further condenses a system, orderly exertion which enhances the execution of lawful structures, institutional plans, and money related arrangements, innovation, activities the broad, human asset advancement, and open support and consciousness of Integrated MSW frameworks.

Keywords: Solid waste management, hazards, health, ecological

Comparative Analysis of Heat Transfer through Triangular Fin Using Numerical Techniques and ANSYS

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Abstract:The present work is proposed with its purpose to investigate the detailed parameters of the conjugate convection of the surface radiation of a typical non-uniform triangular fin. The equation of control of the temperature distribution along the fins is obtained by appropriate conduction, energy balance between convection and radiant heat transfer. The resulting nonlinear differential equations are converted to algebraic form by appropriate finite difference formulas. The algebraic equations obtained are solved using the Gauss-Seidel iterative solver.

Computer code in C++ is specifically designed to solve this problem. Grid sensitivity analysis has been performed to achieve the best grid scale. In the present exercises, unequally spaced and equally spaced grids are tried. Here, it is discussed in detail the independent parameters, namely the thermal conductivity of the fin material, the surface emissivity and the effect of the convection heat transfer coefficient on the local fin temperature distribution.

Keywords:Non-uniformtriangularfin,ConjugateConvection,SurfaceRadiation,FiniteDifferenceMethod.

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Surface modification Of Mish metal added Magnesium alloy via Ultrasonic assisted Friction Stir Processing

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Abstract: The present work aims to enhance the surface of the Mg-4Al-3Zn-3Sn-3Pb-0.5misch metal by introduction of ultrasonic vibrated friction stir processing method. The process improves the uniform grain refinement of the matrix material. The dendritic nature of the mish metal plays vital role for improvement of microstructural and mechanical properties. In addition, the vibratory forces enhance the grain refinement and uniform distribution of mish metals in the matrix. The hardness of the base material and without mish metal magnesium alloy were analyzed.

Keywords: Magnesium, Hardness, Mish Metal, Ultrasonic assisted Friction Stir Processing.

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A Study on Municipal Solid Waste Management in Indian Cities

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Abstract: Municipal Solid Waste Management (MSWM) is one of the major problems of Indian cities with the environmental and economic aspect. Inappropriate management of Municipal Solid Waste (MSW) depletes natural resources and pollutes the environment and causes hazards to inhabitants. Here, an attempt has been made to provide a comprehensive report on waste generation, collection and transportation. The main purpose of this review is to add on the knowledge and understanding of waste management planning, concept, framework, strategies and components that are current and emerging in the field. Proper waste management can be costly in terms of time and resources. Therefore, it is important to understand the existence of other options for handling and managing waste in an effective manner which is to be safe and sustainable.

Keywords: Municipal solid waste, waste management; environment; waste to energy; energy recovery.

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Microalgae- the future fuel

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Abstract: Population crisis has led to an extensive rise in demand of the goods and services required for a comfortable living. Moreover, there is an increase in the requirement of a better quality of life. Such necessities pressurizes the existing sources of energy to produce more energy in terms of electricity and fuel. India relies heavily on the non-renewable sector of energy like coal and petroleum for meeting these demands. However, these sources are extremely dangerous to the environment and have been accounted for the major reason of global warming all around the world. This paper focuses on better sources of energy other than conventional source to produce high grade fuel that can be used in the automobile sector like microalgae. Microalgae is an under-exploited source that has an extremely high growth rate that can produce a minimum of two harvests in a month. The biomass harvested after certain processing can be used to produce fuel. These processes- harvesting, dewatering and extraction have been discussed in this paper.

Keywords: Energy, Microalgae, fuel, automobile.

Performance and Emission Studies of a Variable Compression Ratio CI Engine Using Bio Diesel Made From Waste Cooking Oil

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Abstract: Compression ignition (C.I.) engine is the un-debated choice for power applications, stationary or mobile. There is an urgent need of alternative high potential fuel for C.I. engines in order to fulfill energy needs without hampering the thermal performance and stringent emission standards. Here waste cooking oil is chosen as an alternative fuel, which is upgraded into biodiesel in the laboratory using mechanical stirring and ultrasonic cavitation technique of biodiesel production.

Four blends of cooking oil are made by increasing 20% its amount in conventional diesel fuel. Performance is analyzed for two compression ratios, 15 and 17.5, on the existing VCR diesel engine set up interfaced with "Engine Soft" software. The results show that as bio-diesel concentration in a blend increases, the thermal performance (i.e., brake thermal efficiency) and emissions (i.e., CO, HC and NO_x, and smoke intensity) are observed to be marginally higher; on the other hand, as compression ratio increases, the thermal performance improves; CO and smoke opacity decreases.

Keywords: Bio diesel; cooking oil; alternative fuel; CI engine

Effect of Welding Parameters on Welding of Aluminum

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Abstract: Aluminium alloys are alloys in which Aluminium is predominant metal. It is a mixture of Copper, Magnesium, Magnese, Silicon, Tin and Zinc. Aluminium and Aluminium alloys provides wide field of fabrication and formability.

TIG and MIG are the two-welding method used to weld Aluminium. Welding current, gas flow rate, and welding speed are the input parameter which influence the output response over welded joints.

MIG welding is used where demands on weld quality are very high. Bead dimension of weld such as penetration bead thickness and toe radius can reveal whether a weld can reach high fatigue life. However, several welding parameters have high impact on these dimensions. It has been indicated that geometrical parameter such as torch angle, weld position, push or pull direction etc. are the most influential ones concerning quality of weld with solid wire. Even though metal cored wires depict several advantages compared to solid, a lot of skepticism is faced among industries due to its higher cost response parameter of a fillet weld by GMAW using metal core wire were investigated as a function of welding geometry parameter. The goal is to reveal the optimal settings aiming at as high productivity as possible.

TIG welding process is used to analyzed the data and evaluate the influence of input parameter on tensile strength and hardness of Aluminium specimen. To improve welding quality of Aluminium plate pre and post welding precautions must be taken during welding process. TIG Welding is a high-quality welding process used to weld the Aluminium. Welding of Aluminium plate by varying input parameters, the output parameter gets studied optimized so that better quality of welded joints will develop. So, effect of welding parameter on the tensile strength and hardness of weld joint will analyzed.

Keywords: Aluminium & its alloys, TIG and MIG welding, Tensile strength, Hardness.

Modelling and Analysis of an MR Damper used in Small Size Automobiles

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Abstract: Researchers are continuously involved in the development of dampers used in automobiles for enhancing human comfort. Dampers heavily depend on the use of a damping fluid to absorb and damp shock impulses. They operate on the principles of inertia, stiffness and damping effect of the fluid. The damping of the system mainly depends on the damping coefficient, a useful parameter to evaluate damping force which is due to the combined effect damping coefficient and velocity of the damper. Present study, based upon a special type of dampers called Magnetorheological (MR) dampers which have been analysed and studied. Design and analysis of an underdamped MR damper have been carried out for expanding the MR damper applications to a wider spectrum of automobiles. An attempt has been made to study the composition and desirable properties of MR Fluids. These dampers make use of MR Fluids which are smart fluids capable of changing their plastic viscosity and dynamic yield stress on the application of an external magnetic field. These dampers have a wide dynamic range while having a low power requirement. They are advanced shock absorbers that offer a flexible semi-active control and having a fast response rate makes them more desirable than conventional dampers. MR dampers have an application in a wider range of automotive systems.

Keywords: Dampers, Magnetorheological, Automobiles, Fluids, Viscosity, Yield Stress.

Review of Molecular Dynamics: A Molecular Simulation Technique

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Abstract: Molecular dynamics (MD) is a computer simulation method for studying the physical movements of atoms and molecules, and is thus a type of N-body simulation. The atoms and molecules are allowed to interact for a fixed period of time, giving a view of the dynamical evolution of the system. In the most common version, the trajectories of atoms and molecules are determined by numerically solving Newton's equations of motion for a system of interacting particles, where forces between the particles and their potential energies are calculated using interatomic potentials or molecular mechanics force fields. The method was originally developed within the field of theoretical physics in the late 1950s but is applied today mostly in chemical physics, materials science and the modelling of biomolecules. The theoretical basis for MD embodies many of the important results produced by the great names of analytical mechanics – Euler, Hamilton, Lagrange, Newton. Their contributions are now to be found in introductory mechanics texts. The simplest form of MD, which of structure less particles, involves little more than Newton's second law. Rigid molecules require the use of the Euler equations, perhaps expressed in terms of Hamilton's quaternions. Molecules with internal degrees of freedom, but that are also subject to structural constraints, might involve the Lagrange method for incorporating geometric constraints into the dynamic equations. In certain cases properties at constant temperature and pressure are required; there are ways of modifying the equations of motion to produce such systems, but the individual trajectories no longer represent the solution of Newton's equations. Therefore, Molecular Dynamics simulation is considered as the best technique to study the interatomic interactions between atoms and is helping the researchers to develop advanced materials with extraordinary physical and chemical properties.

Keywords: Molecular dynamics, simulation, atom, Newton equation

Design and development of Inertia Dynamometer for FSAE application

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Abstract: A dynamometer is a device used to measure the torque required to operate a driven load. Dynamometers have been used in the automobile industry since decades to improve the performance as well as efficiency of the engine through engine tuning and emissions testing. The cost of an aftermarket dynamometer usually depends upon its type, size & data logging capabilities. In this paper, we discuss the development process of a reliable & cost-effective inertia dynamometer for FSAE application. The testing procedure is to accelerate an inertial mass (flywheel) from rest to its maximum speed & calculate the engine power versus speed using the inertia of the flywheel and its rate of change of angular speed. The dimensions of the inertial load, bearings, shaft & foundation have been selected based on theoretical calculations & structural analysis using ANSYS. A Hall-effect sensor has been used to measure instantaneous speed during test. This data is logged through Arduino-Uno and processed using MATLAB and Ms-Excel. The results were satisfactorily similar to that from the power curve supplied by the OEM and engine model developed on Ricardo WAVE software hence proving the accuracy of the dynamometer.

Keywords: Dynamometer, torque, automobile

India's Energy Security

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Abstract: The objective of this study is to study about the present scenario of electricity in India and its future. Energy plays an important role in the economic growth of any nation. So, availability of energy from sources that are affordable, reliable and environmentally friendly is important for the growth of any nation. India is strongly dependent on the fossil fuels for its energy requirements which is deteriorating its air quality and also contributing significantly to global warming. Renewable energy sources are thus a promising alternative which will enhance our energy security and reduces air pollution. If India failed to protect its environment, not only its economic growth would be impeded but also would pose serious health hazards. As energy demand is expected to increase each year, so a careful analysis of energy production and the availability of resources to produce it is done. Also, necessary actions needed to make India self-sufficient in the energy department are studied.

Present study deals with our current energy needs. Self-sufficiency in energy sector. Energy requirement projection in next 3 decades. Requirement of electricity to run electric vehicles. Alternative energy resources.

Keywords: Energy security, economic growth, environment

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Energy and Exergy Analysis of a Tri-generation (work, heat and refrigeration) Thermal System for Performance Improvement using Retrofitted Techniques and Alternative Refrigerants R1234ze and R1234yf in Cascade Refrigeration Cycle

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Abstract: Energy and exergy analysis of a tri-generation (work, heat and refrigeration) system for performance improvement using retrofitted techniques and alternative refrigerants R1234ze and R1234yf have been presented in the current work. The system comprises a gas turbine cycle, a steam turbine cycle, heat recovery steam generator (HRSG) and a cascade refrigeration cycle. The retrofitted techniques viz. inlet air cooling (IAC) 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 cascade refrigeration cycle for refrigeration production. A computer program has been developed to compute the various performance parameters viz. thermal efficiency, energetic efficiency, COP, Overall cycle efficiency, exergy destruction rate and exergy destruction ratio have been computed and the effect of ambient temperature and relative humidity have been observed on performance parameters. 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 (HFOs) is an environment friendly relationship with the cycle.

Keywords: Tri-generation, Cascade, Exergy, Retrofitted and R1234ze

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A Study of Tribological Behavior at point of contact of cylinder liner and piston rings in a diesel engine

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Abstract: In the present scenario, fuel prices are rising daily basis. Also there is fear of fuel crisis which demands improvements in design and development of compression ignition engines. In this view there is great need to Keep in mind energy/fuel reserves and environmental issues. Researchers are investigating various moving interfaces in the compression ignition engines. Here, focus of this paper is to improve performance with respect to tribological behaviour. hence the interaction between piston rings and cylinder liner in a diesel engine is taken for investigation. The research on this topic is necessary due to the limited published work available in respect to engine in the present study. Firing engine tests were carried out, with an instrumented piston, with telemetric data transmission. The study was carried out for the four stroke working cycle at different levels of engine power output. The results obtained were compared with the simulated results. Here it is concluded that the study is on the formation and development of the oil film between the rings and the liner under different load levels. The thickness of the oil film between piston rings and cylinder liners of internal combustion engine is relevant for the tribological performance of the system.

Keywords: Fuel, Development, Cylinder Liner, Piston Ring, Piston

A review on different optimization techniques used in EDM process

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Abstract:Electrical Discharge Machining (EDM) provides an effective solution for machining of complex shapes and hard conductive materials. As far as the optimization techniques in EDM process are concern, the main objectives are to maximize the material removal rate (MRR) and minimize the surface roughness and tool wear rate. The various process parameters involve in optimization are spark gap, pulse-on-time, pulse-off-time, servo voltage, and peak current etc.

In this review paper, the application of various optimization techniques used in EDM process are discussed which include Taguchi method, Grey relational analysis (GRA), Artificial neural network (ANN), Genetic Algorithms (GA), and Fuzzy logic etc.

Keywords: Electro-discharge machining (EDM), dielectric, optimization techniques, material removal rate (MRR), pulse-on-time, servo voltage, pulse-off-time

Preparation of Barium Hexaferrite Nano Particles

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Abstract M-type barium hexaferrite ($\text{BaFe}_{12}\text{O}_{19}$) was discovered in the 1950s by Philips' laboratories. Due to its appropriate magnetic properties, chemical stability and low cost compared with rare-earth compounds, it has attracted extensive interests in the past decades. It is a hard magnet with high coercivity, which originates from high magneto-crystalline anisotropy with single easy magnetization axis. In this study, sol-gel auto combustion technique has been used. In this study $\text{Ba}(\text{NO}_3)_2$, $\text{Fe}(\text{NO}_3)_3$ and citric acid were blended in a solution to obtain sol. Then the sol was dripped onto the absorbent cotton template. After the volatilization of the moisture, gel was formed on the surface of the absorbent cotton template. This gel was dried to obtain dry-gel. Then the dry-gel was calcined under different temperatures for two hours in a furnace to obtain $\text{BaFe}_{12}\text{O}_{19}$ nanoparticles. The phase of the samples was studied by X-ray diffraction (XRD), and the morphology and particle diameter of the samples were determined using scanning electron microscopy (SEM).

Keywords: X-Ray Diffraction, M-Type Barium Hexaferrite, Sol-Gel Auto Combustion Method, Scanning Electron Microscopy

Design and manufacturing of brake rotor using AMMC (Aluminium Metal Matrix Composite) and by using stir casting method

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Abstract: Aluminium matrix composites (AMCs) are potential materials for various applications due to their good physical and mechanical properties. The addition of reinforcements into the metallic matrix improves the stiffness, specific strength, wear, creep and fatigue properties compared to the conventional engineering materials. This paper deals with the designing and manufacturing of a brake rotor using the combination of Aluminium, silicon carbide along with small quantity of magnesium. For the manufacturing stir casting method is used. In this paper Al6061 is used as base alloy and Al2O3 as matrix material, the whole process is carried out in a controlled environment. Effective designing techniques are taken into consideration that is weight reduction without compromising the strength. Thermal performance factors are also considered which was identified by doing FEA (Finite element analysis).

Keywords: Brake rotor, composites, stiffness, wear

Identification of MCDM Techniques for Life Cycle Analysis of IC Engine

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Abstract : Since the start of the human civilization people preferred to live near the water bodies or rivers as the water is the most essential requirement for life on the earth. Archeologist found early civilization near rivers like Sindhu Sabhyata. Thereafter with the growth of population human ancestors started to travel in all directions, constantly in search of abundant food resources and new places to inhabit. The only mode of transportation at that era was Shanks pony. After that people eventually learned to domesticate and use animals i.e. Donkeys, horses, elephants and camels etc. for transport. Meanwhile about 3,500 BC the innovation of wheel was a great milestone in the journey of the transportation. In the sequence of innovation, the invention of steam engine gave a historic leap to the rail travel. Due to that power utilized for transportation obtained from muscle power of animal or human shifted to fuels like coal. For transportation mostly IC engine powered vehicle are utilized in which gasoline, diesel or natural gas are burned to convert the chemical energy of fuel into mechanical energy. Due to the increase in demand of the number of vehicles lead to the rapid depletion of fossil fuels. Further it is the major cause of environmental pollution. To counter these limitations various researches has been conducted. Earlier researchers were focused on the enhancement of the efficiency of the IC engines due to which mileage of the vehicles increased. Later on researchers contributed to replace the conventional fuel i.e. Diesel and petrol or gasoline by natural gas, and blending of biodiesel, biomass gasification technology. Using of electrical vehicles is the other method to counter those problems. Hence it is a need of Life cycle analysis at this stage. An extensive literature review was conducted in the field of life cycle analysis. Various authors suggested that MCDM tools are very useful for Life cycle analysis. In this paper a review is presented to find out different types of MCDM tools or techniques and their application for life cycle analysis.

Keywords: MCDM Techniques, Life Cycle Analysis and IC Engine.

Dynamic Stresses Analysis of Turbine Blade Using Bond Graph Modeling

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Abstract: The present paper deals with dynamic stress analysis of first stage gas turbine blade through bond graph modeling. The blade under consideration is a first stage blade of 30 MW gas turbine. The blade is made of nickel based super alloy Inconel 738LC, having operating temperature 1100°C, rotates at 5135 rpm and pressure of gas stream impacting on leading edge of turbine blade is 10 Kgf/cm². This pressure excites a large number of frequency modes. This research work explores the ability of the bond graphs to create models of the turbine blade. A discrete bond graph model of the turbine blade is being created, which is simulated through Runge-Kutta fourth order method using SYMBOL-shakti software to obtain the dynamic behavior of gas turbine blade. The parameters used in bond graph modeling are evaluated experimentally and computationally for single gas turbine blade. Frequency response function (FRF) of turbine blade obtained through software SYMBOLS Shakti. While comparing the modal frequency obtained through simulation with computationally and experimentally obtained value of modal frequency of turbine blade the percentage error evaluated is 2.987%, which is very close. It is concluded that bond graph model portray the real dynamics of turbine blade.

Keywords: Gas turbine, blade, frequency response function

Production of Biodiesel with the Use of Microwave Reactor for Tranesterification of High FFA Containing Feedstock- A Review

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Abstract: Effective utilization of energy has become need of the hour now a day. Biodiesel is an alternative to take care of fuel crisis and environment related issues to an extent. In this study, biodiesel is obtained by using non-conventional microwave reactor for two step transesterification from non-edible, marginally utilized feedstock. The amount of biodiesel produced is found to be economical in terms of energy utilization. The biodiesel produced in this study is found to be steady under different atmospheric conditions. The important Physico-chemical properties of the produced biodiesel compatible with standards of ASTM D6751 and EN 14214 and suitable for automotive CI engines.

Keywords: Biodiesel, transesterification, non-conventional

Performance Evaluation of Wick Cooled Condenser in Vapor Compression Refrigeration System

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Abstract: Presently, the reduction in energy consumed by an air conditioner working on a vapor compression refrigeration cycle is a major issue. Application of evaporative cooling on a small-scale refrigeration and air conditioning system is limited due to its larger size and economy. In the present work, porous wick cloth is used on the condenser tube which is combined with direct evaporative cooling. Evaporation of fluid entrapped in the pore of wick cloth increase the heat transfer rate. The effect of evaporative cooling of the condenser on the performance of the air conditioner is experimentally investigated. The result shows about 32.4% enhancement in COP with a maximum ambient temperature of 35°C and 10-11% reduction in energy consumption and relative humidity about 21-26%. Refrigeration effect increased up to 30.6% with respect to the water cool condenser.

Keywords: Vapor compression, wick cooled condenser, COP.

Overview of Refrigerants and Comparison of COP of R1233zd[E] with HFCR134a

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Abstract : To subdue the hazards of refrigeration and air conditioning equipment Due to trivial refrigerants which lead to depreciation of environment and aggravation in global warming because of the irhigh GWP, the reisaned Form agnanimously witching to low-GWP refrigerants. R1233zd (E) is a low-GWP Alternative which we have tried to use with trivia lrefrigeration systems. Itis an Excellent environment friendly refrigerant asithasa low environment burden (global warming potential, GWP=1 and a very short atmospheric life of 26days), is low toxicity, and is nonflammable. The C.O.P. (coefficient of performance) of a refrigeration system with R1233zd(E) is higher than that of R134 a at various temperatures and pressures for evaporator, condenser and compressor. If used in VCRS (variable compression refrigeration system) then it could lead to greater Efficiency and lower global warming.

Keywords : Refrigerant, global warming, coefficient of performance

Tribological Study on Effect of Cold Rolling Process on Microstructure and Mechanical properties of materials: A Review

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Abstract: Cold rolling of metals is an important metal-forming process used widely in industries. It had been used in every aspect of our life. Various type of section like tee, angle, channel, railway track, sheets, foils of different material are made by cold rolling process. Quality of product depends upon the various characteristics of rolling parameter. Basically, in cold rolling process a sheet is rolled between two rolls and material is deformed. The tribological properties as friction, wear and lubrication of roll and sheet interface affect the quality of product. So, it has attracted the attention of engineers and researchers to ensure good quality product and higher productivity. The objective of the present study is to investigate the role of cold rolling on the microstructure and mechanical properties of different materials. For this purpose, the effect of different tribological parameters including rolling speed, different type of lubricants, rolling direction, amount of deformation, friction, number of rolling pass, reduction of rolled materials on material structure and properties have been studied.

Keywords: Cold rolling, tribology, roughness, mechanical properties, microstructure.

To Study And Analyze the Variation of Pressure Recovery Coefficient at the Walls of Axial Annular Diffuser at Area Ratio 2.5 and Casing Diverging Angle of 6° using CFD

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Abstract: The present work relates to the analysis of flow through the parallel hub and diverging casing annular diffuser. In this analysis variation of pressure recovery coefficients have been visualized at the diffuser walls with and without swirl. The casing angle and area ratio have been taken as 6° and 2.5°. The swirl angle was varied from 0° to 25° at the inlet of diffuser. The analysis was carried out for flow regime with various experimentally obtained inlet velocity profiles with or without swirl. Pressure coefficients have been calculated along the casing and hub walls of axial annular diffuser. In the present work CFD approach was used to find the results by using RNG k – turbulence model.

Keywords:-Annular diffuser, Pressure recovery coefficient, Area ratio, Casing diverging angle and CFD.

Designing and implementing the rack and pinion mechanism in a RC car for robosoccer

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Abstract: Robosoccer is an event in which wired or wireless robots are used along with their hitting mechanism to play soccer like it is played in the real world. The game robosoccer greatly depends on proper handling of the robots, the hitting mechanism and the strategies to control and move the ball in the direction in which you desire. This paper puts great emphasis on the design consideration of a rack and pinion mechanism having the ability to hit the ball with great force in minimum possible time. In this rack and pinion mechanism rack and pinion system is used. The energy is supplied to dc motor which rotates the pinion fitted on the shaft of motor which causes gear on pinion and rack to mesh with each other. And during this meshing it causes rack to move back in order to generate force for hitting the ball as soon as rack is released to move in the forward position. In this way the rotational kinetic energy by dc motor is converted into translational energy of the rack. The process is repeated multiple times according to the situation of game in backward and then forward position to hit the ball. Many ideas were put into the work keeping in mind to get a reliable and compact robot for proper professional robosoccer game. But many new techniques and improvement can be done to enhance the robot for better performance in the upcoming future.

Keywords:- Car, Robosoccer, rack and pinion.

Supercritical carbon dioxide cycle based combined cycle for power generation and waste heat recovery

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Abstract: This paper present with the literature work in the field of supercritical carbon dioxide cycle (SCO₂ cycle) based combined cycle especially with the purpose of power generation and waste heat recovery applications. In the recent years, SCO₂ cycle and its various layouts such as recompression and partial-cooling cycles have developed as some promising options. Various heat source such as concentrated solar power (CSP) systems based on solar thermal energy and nuclear power can be utilized in order to operate the SCO₂ cycle based combined cycle configurations. In this way, SCO₂ cycle can be integrate in a combined cycle configuration as a topping or bottoming cycle in order to achieve the desired benefit. Therefore, this work mainly concentrates on the recent developments in the area of CSP based combined cycles and its literature work discussed in a detailed manner.

Keywords: Power Generation, waste heat recovery, solar thermal energy
