AY 2020-21, ISSUE 2

TECHNICAL TRENDS

Department of First Year Engineering - Technical Magazine

EDITORS

Prof. Shilpi Bhuinyan
Prof. Merilyn D'Cruz

Technical Trends is a magazine that speaks volumes about the hard effort taken by the faculty members and students to plunge into the areas of research, environmental awareness and latest technologies. We at the department of First Year Engineering, draw the advantage of being multidisciplinary, leading to diverse projects from students and faculty.

We represent a bouquet of vivid specialities showcased through one magazine “TECHNICAL TRENDS” This magazine will be published every semester enhancing the zeal within its stakeholders to achieve beyond the established benchmarks. Let’s raise the bar of our magazine by being an inevitable part of it. Remain Blessed!

Our Inspiration

Shri. Shahu Chhatrapati Maharaj

President, AISSM Society's

From Principal's Desk

Dr. D S Bormane
Principal AISSMS COE, PUNE

I'm glad to signify that with commencement of this year 2021, AISSMS College of Engineering has completed 28 grand years of its establishment.

AISSMS COE as an outcome of academic excellence achieved, is consistently producing University gold medallists and top rankers in different branches of engineering. Faculty is actively involved in research and development. College has number of very high-end analytical, computational and experimental facilities at the disposal of students. We are going to concentrate more upon the Engineering Research activities and use those for students and society welfare.

I am confident that the College is in a position to deliver the best theoretical and practical training to the students and offer the best talent to the employers. I wish all the best to the aspiring students, employers and all other stake–holders in achieving their goals.

All India Shri Shivaji Memorial Society's

College of Engineering

Vision:

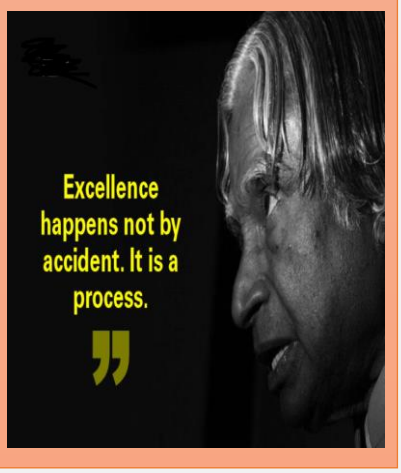
Service to Society through quality education.

Mission:

- ☐ Generation of national wealth through academics and research.
- ☐ Imparting quality technical education at cost affordable to all strata of the society.
- ☐ Enhancing quality of life through sustainable development.
- ☐ Achieving the distinction of highest preferred engineering college by stake holders.
- ☐ Carrying out high quality intellectual work.

Goals:

- ☐ To inculcate learning habits
- ☐ To create an environment to make the students creative and innovative
- ☐ To promote project based learning.
- ☐ To strengthen industry – institute interaction.
- ☐ To ensure continuous improvement in quality.
- ☐ To develop entrepreneurship skills.
- ☐ To nurture the spirit of team work.
- ☐ To catalyse all – round development of students.
- ☐ To develop technologies for sustainable development.



From FE Head of Department's Desk...

Prof. V. R. Patil
Head, First Year Engineering Dept.

First Year Engineering plays a pivotal role in ushering the students to be a prospective engineer. The department nurtures and molds the students to enter in the rapid fast changing pragmatic world yet maintaining the sensitivity in them. The teaching –learning methodology used by staff boosts the students thinking potential and lifts their critical analyzing skills .As most of the students come from the diversified social environmental it becomes a need for the department that they are mentored by the staff with whom they can share their thoughts,expectations,express themselves and would feel comfortable away from home.

What the stakeholders are usually interested in is the staff, isn't it? So we as the department is the family of 32 faculty and 5 supporting staff for 11 divisions each with 60 students. The department has well qualified and experienced staffs that is always on their toes. The faculties have excellent academic records and are highly regarded amongst students. The various subjects offered to students in First Year, though common to all branches, essentially lays a strong foundation to emerge as a potential engineer. Hence, Our Self –motivated staff wholly dedicated to the first year department, do their best and try to make the subjects simple and interesting.

The activities like Expert Lectures, Site Visits, Technical Events, Sports and Cultural Events, Soft Skills etc. widens their horizon and avert them from being monotonous with academics.

To conclude, the department Catalyzes and assures a very healthy, amicable but a competitive ambience for our future engineer.

Department of First Year Engineering

Introduction:

As the students are now geared to Explore the vast ocean that invariably Allures them and have gamut of Rainbows to be coloured, we too as the department also have certain specific Vision & Missions to be accomplished in the precincts of the department.

Vision:

Impart students with pre-requisites of technical know how's to expedite.

Mission:

- ☐ Embed crucial thinking and analytical reasoning ability required by respective disciplines/courses/branches.
- ☐ Cultivate students to deal with stress and anxiety imposed by academics and social milieu.
- ☐ Nurture students to emulate and inculcate the judicious nature demand by the multifaceted world.

Short Term Department Goals:

1. Modernization of Laboratories
2. Improvement in University Results
3. Emphasis of ICT for improvisation of Teaching –Learning Methodology
4. Strengthening Collaborative Research across various Institutes, Colleges, Industries, etc,.
5. Motivating all the PG faculty for pursuing PhD

Long Term Departmental Goal:

1. Development of e-classrooms
2. Promote every student to higher class
3. Embed the quest for knowledge amongst faculty
4. Resource generation through Consultancy & Research
5. Comprise of Counselling and Mentoring Cell for students & faculty.

Saurabh Relekar
FE Civil B

CONTENTS

CONTENTS

CONTENTS

FACULTYS' PUBLICATIONS

SYNTHESIS, STRUCTURAL AND ELECTRICAL CONDUCTION OF SOME DUAL DOPED SEMICONDUCTOR OXIDES NANOPARTICLES FOR PHOTOCATALYTIC DEGRADATION OF VICTORIA BLUE-B AND BRILLIANT YELLOW UNDER SOLAR LIGHT IRRADIATION

N. J. Karale-Unde[1,2] , A. K. Nikumbh[1], M. B. Khanvilkar[1,3], P. A. Nagawade,R. A. Pawar[1] , Dr. D. V. Nighot[1],S. B. Misal[1] and G. S. Gugale[1]

[1]Department of Chemistry, Savitribai Phule Pune University (Formerly University of Pune), Ganeshkhind, Pune 411 007, India
[2]Department of Chemistry, Fergusson College, Shivajinagar, Pune 411 004, India
[3]K. M. C. College, District Raigad, Khopoli, Tal. Khalapur 410203, India

Abstract : In this study, the nanoparticles of undoped and dual (codoped) doped semi-conductor oxides such as Bi_2O_3, $Bi_{1.9}Sm_{0.038}Cu_{0.062}O_3$; Co_3O_4, $Co_{2.902}Mn_{0.049}$-$Dy_{0.049}O_4$; V_2O_5, $V_{1.91}Ni_{0.043}Gd_{0.047}O_5$; Cu_2O, $Cu_{1.927}Mn_{0.036}Yb_{0.037}O$; CeO_2, and $Ce_{0.938}Ni_{0.028}Zn_{0.034}O_2$ were synthesized by tartarate and hydroxide coprecipi-tation method. The composition, structure, morphology, surface and optical properties of undoped and dual doped semiconductor oxides have been investigated by X-ray fluorescence spectroscopy (XRF), Energy dispersive X-ray spectroscopy (EDS), X-ray powder diffraction (XRD), Scanning electron micro-graphs (SEM), X-ray photoelectron spectroscopy (XPS), BET surface area ana-lyzer and UV–Vis diffuse reflectance absorption spectra (UV–vis DRS). The XRD and SEM studies showcase monodispersion of undoped and dual (co-doped) doped semiconductor oxides in the average grain size range of 36–65 nm with a monoclinic structure for Bi_2O_3 and its doped oxide, cubic structure for Co_3O_4,Cu_2O, CeO_2 and their respective doped oxides and orthorhombic structure for V_2O_5 and its doped oxide. Rietveld refinements of XRD pattern and XPS results confirmed that the dual dopants exist in +2 or +3 states and successfully incorporated into the semiconductor oxide matrix. BET surface areas for these oxides were found in the range of 25.3–65.4 m^2g^{-1}. The band gap energy (Eg) of undoped and doped semiconductor had a direct transition to fall between 2.10 and 3.12 eV as estimated from the optical absorption data (UV–vis DRS) and found absorption band edge (kg) in the visible-light range. The d.c. electrical conductivity and thermo-electric power measurements for all compounds showed n-type semiconductor except undoped and doped Cu_2O and Co_3O_4 compounds showed p-type semi conductivity. The photo catalytic activity of undoped and dual doped semiconductor oxides in the Victoria blue-B (VB) and Brilliant yellow (BY) solutions were studied in sunlight irradiation. A set of optimized conditions such as the amount of these oxides, initial dye concentration, pH, contact time and dopants on the photodegradation of these dyes were investigated in detail. The dual doped semiconductor oxides showed a noteworthy enhancement in the degradation of VB and BY dyes under exposure to sunlight. The enhanced photocatalytic activity can be attributed to the incorporation of multivalent dopants in semiconductor oxide matrix

promoted the separation of photogenerated charges, inhibited the recombination of photo generated carriers, and thus prolonged the charges lifetime to participate in the photocatalytic reaction. The kinetic measurements indicate the dominance of pseudo-first order rate constant for Victoria blue-B (VB) were higher than that of Brilliant yellow (BY) in all cases, indicating that the photocatalytic degradation of VB was easier and more rapid than BY dye during the adsorption and also ascribed to different molecular structure to these dyes. A tentative reaction mechanism has also been proposed for this photocatalytic reaction.

J Mater Sci: Mater Electron (2021) 32:4998–5034

STRUCTURAL, ELECTRICAL AND MAGNETIC PROPERTIES OF SUBSTITUTED PYROCHLORE OXIDE NANOPARTICLES SYNTHESIZED BY THE CO-PRECIPITATION METHOD

M.B. Khanvilkar[1,2], A.K. Nikumbh[2], S.M. Patange[3], R.A. Pawar[2], N.J. Karale[2],Dr.D.V. Nighot[2], P.A. Nagwade[2], M.D. Sangale[2], G.S. Gugale[2]

[1]K.M.C. College, Khopoli, Tal-Khalapur, Dist. Raigad, India
[2]Savitribai Phule Pune University (Formerly University of Pune), Ganeshkhind, Pune, India
[3]Shrikrishna Mahavidyalaya, Gunjoti, Tal- Omerga, Dist. Osmanabad, India,

Abstract: Five substituted pyrochlore nanooxides such as $Nd_{1.9}Ho_{0.1}Zr_{1.8}Ce_{0.2}O_7$, $La_{1.95}Ce_{0.05}Zr_{0.29}Ce_{1.71}O_7$, $Y_{1.79}Pr_{0.21}Ru_{1.99}Pr_{0.01}O_7$, $Dy_{1.9}Yb_{0.1}Mn_{1.93}Cu0.0_7O_7$ and $Dy_{1.99}Sr_{0.01}Sn_2O_7$ were synthesized by coprecipitation method. These precursors were monitored by thermal studies (TGA-DTA). The prepared nanosized substituted pyrochlore oxides were characterized by EDS, XRD, SEM, TEM, d. c. electrical conductivity, Thermoelectric power, Hall effect measurement, dielectric properties and magnetization measurements. XRD confirmed the formation of a single phase crystalline substituted pyrochlores with a cubic nature of nanoparticles. All substituted compounds were adopted a stable pyrochlore structure with rA^{3+}/rB^{4+}=1.395 except $La_{1.95}Ce_{0.05}Zr_{0.29}Ce_{1.71}O_7$ compound, which has rA^{3+}/rB^{4+} = 1.175 indicate disorder pyrochlore structure (i.e. fluorite structure). The temperature dependence of d. c. electrical conductivity for all substituted pyrochlores exhibits two distinct slopes with a break. This discontinuity can be attributed to extrinsic to intrinsic semiconducting properties. The thermoelectric power and Hall effect measurements for all compounds were confirmed the p-type semiconductivity except $Y_{1.79}Pr_{0.21}Ru_{1.99}Pr_{0.01}O_7$ compound and which showed n-type semiconductivity. The dielectric constant (ε') and dielectric loss (tan δ) i. e dissipation factor decreases with an increase in frequencies and reaching constant at particular frequencies. The applied field dependence of magnetization curve at room temperature (300 K) for $Nd_{1.9}Ho_{0.1}Zr_{1.8}Ce_{0.2}O_7$, $Y_{1.79}Pr_{0.21}Ru_{1.99}Pr_{0.01}O_7$ and $Dy_{1.9}Yb_{0.1}Mn_{1.93}Cu_{0.07}O_7$, showed hysteresis loop with a small kink around the origin and

which can be attributed to small but definite ferromagnetic ordering along with significant paramagnetic and superparamagnetic components. The magnetization at 2K showed a clear hysteresis loop for $Dy_{1.9}Yb_{0.1}Mn_{1.93}Cu_{0.07}O_7$ and $Dy_{1.99}Sr_{0.01}Sn_2O_7$ pyrochlores are soft (weak) ferromagnets.

Keywords: substituted pyrochlore-type oxides, ferromagnetism, electrical conductivity, magnetization, exchange interaction, coprecipitation.

PHYSICS AND CHEMISTRY OF SOLID STATE V. 22, No. 2 (2021) pp. 353-371, DOI: 10.15330/pcss.22.2.353-371

ELECTRICAL AND MAGNETIC PROPERTIES OF CD1-XFE2-XCOXBI0.3O4 NANOPARTICLES SYNTHESIZED BY CHEMICAL CO-PRECIPITATION TECHNIQUE

G. S. Gugale[1], V. U. Pandit[2], Dr. D.V. Nighot[3], R. A. Pawar[4], V. S. Jawale[5], M. B. Khanwilkar[6],A. K. Nikumbh[7]

[1,2]Department of Chemistry, Haribhai V. Desai College, Pune- 411 002 (India)
[3]Department of Engineering Sciences, AISSMS, College of Engineering, Pune, 411 001, India
[4,5]Prof. Ramkrishna More College, Akurdi, Pune 411044, India
[6]Department of Chemistry, K.M.C. College, Khopoli, Dist. Raigad, Khopoli, 410203, India
[7]Department of Chemistry, Savitribai Phule Pune University, Pune, India

Abstract: The nanoparticles of $Cd_{1-x}Fe_{2-x}Co_xBi_{0.3}O_4$ ferrites (x=0.0- 2.0) were prepared by the tartarate coprecipitation technique. The formation of the ferrite phase was confirmed by X- ray diffraction, which is a characteristic of the spinel ferrite.Increase in lattice constant was observed with increase in x. These samples showed the usual temperature dependence electrical conductivity having the ferrimagnetic to paramagnetic transitions. The magnetic properties such as the saturation magnetization (Ms), coercivity (Hc) and ratio of remanences to saturation magnetization (MR/MS) were obtained from the hysteresis loop. It is observed that the Ms and Hc increases with increase of x, which is attributed to the presence of an ultration layer at the grain boundaries that impedes the domain wall motion. The observed low magnetic moment can be explained in forms of spin canting at the surface of nanoparticles. The electrical and magnetic properties suggest that, both N'eels two sublattice and Yafet - Kittel models exist for x = 0.4 to 0.8. The increase in coercivity suggests that the material can be used for applications in perpendicular recording media.

Keywords: Ferrites, Spinal, Ferrimagnetic, Co-precepetation, Magnetic

International Journal of All Research Education and Scientific Methods (IJARESM), ISSN: 2455-6211Volume 9, Issue 3, March -2021, Impact Factor: 7.429,

IMPROVED ESTIMATES ON INITIAL COEFFICIENTS OF CERTAIN SUBCLASSES OF BI-UNIVALENT FUNCTIONS

Dr. Amol B Patil [*1] and Uday H Naik[2]

[1]Department of First Year Engineering, AISSMS's, College of Engineering, Pune-411001, India.

[2]Department of Mathematics, Willingdon College, Sangli-416415, India.

Abstract : In the present paper, we derive estimates on initial coefficients |a2|, |a3| and |a4|for functions belong to the two well-known subclasses TΣ(β) and T_{Σ}^{α} of the bi-univalent function class Σ defined in the open unit disk U. These estimates shows improvements in the earlier known estimates for the two subclasses.

Keywords: Analytic function, Univalent function, Bi-univalent function, Coefficient estimate.

Mathematics Subject Classification 2010: 30C45, 30C50

Global Journal of Pure and Applied Mathematics. ISSN 0973-1768 Volume 16, Number 3 (2020), pp. 507-514,© Research India Publications

---

COEFFICIENT ESTIMATES FOR CERTAIN SUBCLASSES OF M-FOLD SYMMETRIC BI-UNIVALENT FUNCTIONS ASSOCIATED WITH PSEUDO-STARLIKE FUNCTIONS

Timilehin G. Shaba[1],* and Dr. Amol B. Patil[2]

1 Department of Mathematics, University of Ilorin, P. M. B. 1515, Ilorin, Nigeria
E-mail: shabatimilehin@gmail.com

2 Department of First Year Engineering, AISSMS College of Engineering, Pune-411001, India

Abstract: In the present investigation, we introduce the subclasses $\Lambda_{\Sigma}^{m}(\eta, h, \varphi)$ and Λ_{Σ}^{m} (η, h, δ) of m-fold symmetric bi-univalent function class Σm , which are associated with the pseudo-starlike functions and defined in the open unit disk U. Moreover, we obtain estimates on the initial coefficients |bm+1| and |b2m+1| for the functions belong to these subclasses and identified correlations with some of the earlier known classes.

Keywords and phrases: analytic function, univalent function, bi-univalent function, m-fold symmetric function, m-fold symmetric bi-univalent function, pseudo-starlike function.

Earthline Journal of Mathematical Sciences, ISSN (Online): 2581-8147, Volume 6, Number 2, 2021, Pages 209-223

ON SHARP CHEBYSHEV POLYNOMIAL BOUNDS FOR A GENERAL SUBCLASS OF BI-UNIVALENT FUNCTIONS

Dr. A. B. Patil, T. G. Shaba

Abstract: - In the present paper, we introduce a subclass BH Σ (ν, σ, ρ) of the bi-univalent function class Σ, which is defined in the open unit disk U using the Chebyshev polynomials along with subordination. Further, we obtain sharp bounds for the initial coefficients a2, a3 and the Fekete-Szeg¨o functional a3 − δa22 for the functions belong to this subclass.

M.S.C. 2010: 30C45, 30C50.

Key words: - analytic function; bi-univalent function; subordination; Chebyshev polynomial; Fekete-Szeg¨o problem.

Applied Sciences, Vol.23, 2021, pp. 109-117. © Balkan Society of Geometers, Geometry Balkan Press 2021.

ECONOMICAL DESIGN OF BRIDGE COMPONENT

Aditya Nanaware[1], Mahesh Nemane[2] P. R. Satarkar[3]
1, 2, 3 Savitribai Phule Pune University

Abstract: Bridges are the lifelines and supporters for the improvisation of the road network. Not only do the bridges help in traffic flow without any interference but also maintain the safety of roads. Due to this reason the bridges design has gained much importance. This paper is basically concerned about the analysis and design of Component Bridge using Staadpro and IRC-6 1966.The focus of this paper is designing the bridge component as per relevant IRC code & comparing Economical of design with software analysis. Factor considered during Economical of design are accuracy and complexity of design. Above key factors should help to propose economical way of design of bridge component.

Keywords: - IRC6-1966, Staad pro V8i

International Research Journal of Engineering and Technology (IRJET), Volume: 07 Issue: 06 | June 2020, e-ISSN: 2395-0056, p-ISSN: 2395-0072, pp 6831-6849

HYDROXYCOUMARIN ENCAPSULATED SULFONATOTHIACALIX[4] ARENE: ^{1} H NMR, STEADY STATE FLUORESCENCE AND THEORY

Sanhita V. Patil [a], Shridhar P. Gejji [a,*] ,Vrashali S. Kalyani [b], Dipalee D. Malkhede [a,*]
[a]Department of Chemistry, Savitribai Phule Pune University, 411 007, India
[b] FE Engineering Science department, AISSMS COE, Pune 411001, India

Abstract: Encapsulation of 4-hydroxy coumarin (4HC) within the p-sulfonatothiacalix[4] arene has been investigated employing the steady state fluorescence, 1 H NMR titration experiments combined with xB97x-D based density function theory. Theoretical calculations have shown that in the 4HC⊂TSCX4 complex the guest encapsulates partially within the cavity of the macrocycle via CHp interactions while the lactone ring excludes the cavity binds to sulfonate portals of the host by hydrogen bonding interactions. Natural transition orbital analyses were used to assign electronic transitions in 4HC⊂TSCX4 complex and its 7HC analogue. The first allowed vertical excitation at 266 nm in the complex arises from a transfer of electron density on the lactone ring of 4HC to aromatic ring of the macrocycle. Further the C=O vibration at 1791 cm^{-1} in the infrared spectra of 4HC downshifts to 1724 cm^{-1} upon complexation with the TSCX4. The noncovalent interactions reduced density gradient method was employed to characterize non-bonding interactions in the complex in conjunction with quantum theory of atoms in molecules. Steady state fluorescence measurements reveal that addition of TSCX4 in DMSO to 4HC results in quenching of the 397 nm band. Furthermore, the Stern-Volmer quenching constant of the complex determined to be Ksv = $2.19x10^{4}$ M^{-1} has static and the upward curvature concave towards the I0/I axis in SternVolmer plots thus was noticed. The recorded excited state lifetime of complex led to the bimolecular quenching constant kq to be $1.98x10^{4}$ M^{-1} s^{-1}. Upon complexation the hydroxyl protons (Hb) in 4HC engender large deshielding as opposed to aromatic protons of TSCX4 macrocycle which emerge with up-field signals in the measured 1 H NMR spectra. The noncovalent binding manifests in NOESY spectrum of the 4HC⊂TSCX4 complex. The association constant of the complex obtained from the UV–Vis and steady state fluorescence correlate well with those from ^{1} H NMR titration experiments which establish that the inclusion complex is stable.

Journal of Molecular Liquids, Volume 339, 1 October 2021, 116760, 2021 Published by Elsevier B.V.

Action is the foundational key to all success.
– Pablo Picasso

STUDY OF ENERGY DISSIPATOR WITH DIFFERENT BLOCKS TO REDUCE BASIN WIDTH AND TRAJECTORY: A REVIEW

Shilpi Sippi Bhuinyan[1] Prof. Dr. Anand Kr. Sinha[2]

Abstract : One of the most powerful and cost-effective strategies for dissipating hydraulic energy from flood waters is to project the flows into a free trajectory jet shape to a position where the impact produces a downstream river bed dip pool. If takeoff speeds are increasing, ski jumps are standard features of dam spillways for efficient energy dissipation. A significant result of the Froud No. range approach flow, the relative height of the bucket and therefore the angle of the device is found. Using a physical hydraulic model, energy dissipation by a ski-jump can be assessed by evaluating several identified contributing parameters. Important parameters include;1) Geometric water jet trajectory profile such as distance of trajectory, trajectory height, horizontal and transverse impact width;2)Distribution of dynamic impact pressure; 3) average dynamic head of impact; 4) head of impact velocity; and 5) air entrainment. Deflectors are the element that is provided at the outlet to deflect the trajectory into a plunge pool area where sound rock is present so that less erosion occurs.

Keywords: Energy dissipation, Kinetic turbulence, Ski jump, stilling basin.

In Proceeding of 25th HYDRO 2020, INTERNATIONAL CONFERENCE, NIT, ROURKELA, ODISHA, INDIA, 26-28 March 2021, ISBN: 978-93-90631-56-8

EFFECT OF VARYING CONCENTRATION OF NAOH ON GEOPOLYMER CONCRETE

Shilpi S. Bhuinyan[1], Pratik Jadhav[2], Pratik More[3]

[1]Assistant Professor, Civil Engineering Department, AISSMS COE, Pune, India

[2,3]Student, Civil Department, AISSMS COE, Pune, India

Abstract: Various experiments were conducted on infusing of fly ash mixed with NaOH solution and on mixing procedure for preparing geopolymer. Infusing of SiO2 and Al2O3 was investigated by mixing fly ash with NaOH solution for different time intervals and leachates were analyzed in terms of silica and alumina contents. In the separate mixing process of mortar, sodium hydroxide solution is mixed with fly ash for the first 10 min; after that sodium silicate solution is added into the mortar or concrete mixture. In normal mixing, fly ash, NaOH and sodium silicate solutions were fused and mixed at the same time. The geopolymers are cured at 65 C for 48 h. The experimental results have proven that the solubility of fly ash depends on concentration of sodium hydroxide and also duration of mixing with NaOH. For the mixing procedure, separate mixing will give slightly better strength for mortar than normal mixing. Comparatively High strength geopolymer mortar mix of 70 to 75 MPa is obtained when the mixture is formed by using 10 M NaOH.

Keywords: Infusing Waste processing, Industrial minerals Cementation

International Research Journal of Engineering and Technology (IRJET), Volume: 07 Issue: 06 | June 2020, pp 2014-2016

NUMERICAL MODELLING FOR WAVE TRANSFORMATION ALONG THE RATNAGIRI COAST- CASE STUDY

Pranav Vaishampayan[1], Amol S. Borkar[2,] Varun Khengare[3], Ketan Jadhav[4], Abhishek Deshmukh[5], Shilpi Bhuinyan[6], Dr. Prabhat Chandra[7]

1,3-5Student, Civil Engineering, AISSMS COE, Pune-411001, India
2-Scientist 'B', Central Water and Power Research Station, Pune-411024, India
6-Assistant Professor, Department of Civil Engineering, AISSMS COE, Pune-411001, India
7-Scientist 'E', Central Water and Power Research Station, Pune-411024, India

Abstract: Wave transformation from deep shore to the near shore is a composite process. Generally, near shore wave climate along the coast is not readily available. The present investigation covers obtaining the near shore wave climate near Bhagwati breakwater close to Ratnagiri coast along West coast of India by using the Numerical MIKE-21 SW (Spectral Wave) model. The maximum tidal range at the site is about 2.3 m and the site is exposed to waves from SW to NW directions. The deep offshore data as obtained from Indian Meteorological Department (IMD) was utilized to derive the nearshore wave conditions at the Bhagwati Breakwater at (-) 10 m depth. The model results were also compared with the measured wave data at (-) 15 m near site of Bhagwati breakwater. The results from the MIKE-21 Spectral wave model studies show that the predominant waves after transformation from deep to near fall between the sector 225° N to 315° N i.e. the site is exposed to predominant waves from SW, WSW, West, WNW, and NW directions. The significant waves of height of about 2.5m waves reach at (-) 10 m depth. The analysis of the statistical parameters of waves and wave direction shows a reasonably good match between the model and the observed data except some minor difference in the angles. The studies will be very useful for providing input conditions for future port development scheme at Bhagwati bunder for ascertaining the detailed wave tranquility conditions.

Keywords: Wave transformation; offshore wave data; near-shore wave data; numerical modelling.

In Proceeding of 25th HYDRO 2020, INTERNATIONAL CONFERENCE, NIT, ROURKELA, ODISHA, INDIA, 26-28 March 2021, ISBN: 978-93-90631-56-8

NUMERICAL AND EXPERIMENTAL STUDY OF COOLING IN CPU WITH METAL FOAM HEAT SINK

Sumant Patil [1] , Rutuja Deshmukh [2]

[1] Asst.Professor, Mechanical Department, AISSMS College of Engineering, Pune, Maharashtra

[2] Asst.Professor, Mechanical Department, Sinhgad College of Engineering, Pune, Maharashtra

Abstract: Evolving, Enhancing and Ensuring the optimum design of metal foam heat sink complying with applicable requirements for Central Processing Unit (CPU) cooling led to a need for new and more effective methods to enrich the digital world. The aim of this study was to investigate the heat transfer development and properties of Copper foam heat sink to increase the performance and efficiency of CPU. The CPU capacity and heat, increase with increasing the speed and its performance. In order to run the system effectively, the heat must be removed and the surface temperature of the CPU must be kept below critical temperature. The numerical and experimental approach is carried out to compare various parameters such as temperature, fan speed with respect to metal foam characteristics to evaluate the thermal performance. An experimental investigation of heat-transfer characteristics of copper metal foam material was carried out.

KEYWORDS: Heat sink, Heat transfer coefficient, Nusselt Number, Reynolds Number, mass flow rate, thermal resistance.

International Journal of Advances in Engineering and Management (IJAEM), Volume 2, Issue 1, pp: 01-05, ISSN: 2395-5252

USE OF MATLAB SOFTWARE FOR OPTIMIZATION OF SHOCK ABSORBER PARAMETERS

Sumant S Patil[1], Rutuja Deshmukh[2], Amol Kokare[3]

Assistant Professor, Dept of Mechanical Engineering, AISSMS COE, SPPU Pune, Maharashtra, India [1]

Assistant Professor, Dept of Mechanical Engineering, Sinhgad COE, SPPU Pune, Maharashtra, India [2]

Assistant Professor, Dept of Mechanical Engineering, JSCOE, Hadapsar, SPPU Pune, Maharashtra, India [3]

Abstract: Shock absorber is very important term in automobile industries. They are used for the driving comfort and driving safety. This paper presents performance characteristics of the shock absorbers under real conditions. Dynamic behaviours of the absorber are studied by computer simulation and experimental testing and are validated with MATLAB results. The road disturbance is generated in the model by giving speed brakes fixed on drum which is rotated by using motor. In this paper study and analysis of single DOF spring-mass-damper system (Hero Splendor Rear Shock Absorber) and plotted its dynamic characteristics curve for different values of spring stiffness for different oils.

Keywords: Shock Absorber, MINITAB, MATLAB, Optimization-Fuzzy Logic.

International Advanced Research Journal in Science, Engineering and Technology, Vol. 6, Issue 8, March 2021, ISSN (Online) 2393-8021, pp 206-213

DESIGN AND ANALYSIS OF CANISTER

1. Sumant Patil, 2.Rushikesh Thul, 3.Shubham Mohol, 4.Dhairyasheel Mohite,
5. Pranav Langhi,
1 Asst. Professor Dept. of Mechanical Engg, AISSMS COE, Pune,
2345 UG Students, Dept. of Mechanical Engg, AISSMS COE, Pune, India

Abstract: The efforts required in achieving the desired output can be effectively and economically be decreased by the implementation of better designs. A system and method for actuating a hatch door. Ammunitions are commonly transported to battlefields within canisters to avoid environmental exposure and cushion against vibrational damage. A vertical launcher system (Canister) that consists of a hatch door at the top of the hold of the vertical launcher system. This door mechanism enables both opening and closing of the door. For quick opening and closing of hatch door a four-bar mechanism has been designed. A crank-rocker inversion of four-bar mechanism is designed for opening and closing of hatch door of canister. The hatch door opening closing mechanism is simple and easy in operation. The significance and purpose of this work is to provide smooth and quick opening and closing of hatch door during a launch system and also ensure to safeguard the article stored inside the canister launching system

International Journal of Creative Research Thoughts (IJCRT) www.ijcrt.org d152, Volume 8, Issue 9 Dec 2020 | ISSN: 2320-2882

KINEMATIC AND DYNAMIC ANALYSIS OF HATCH QUICK OPENING/CLOSING MECHANISM FOR CANISTER

[1]Sumant Patil [2]Rushikesh Thul, [3]Shubham Mohol, [4]Dhairyasheel Mohite, 5.Pranav Langhi,
[1] Asst. Professor Dept. of Mechanical Engg, AISSMS COE, Pune,
[2345] UG Students, Dept. of Mechanical Engg, AISSMS COE, Pune, India

Abstract: The efforts required in achieving the desired output can be effectively and economically be decreased by the implementation of better designs. A system and method for actuating a hatch door. Ammunitions are commonly transported to battlefields within canisters to avoid environmental exposure and cushion against vibrational damage. A vertical launcher system (Canister) that consists of a hatch door at the top of the hold of the vertical launcher system. This door mechanism enables both opening and closing of the door. For quick opening and closing of hatch door a four-bar mechanism has been designed. A crank-rocker inversion of four-bar mechanism is designed for opening and closing of hatch door of canister. The hatch door opening closing mechanism is simple and easy in operation. The significance and purpose of this work is to provide smooth and quick opening and closing

International Journal of Creative Research Thoughts (IJCRT) www.ijcrt.org d348, Volume 9, Issue 6 May 2021 | ISSN: 2320-2882

A MACHINE LEARNING APPROACH TO PREDICT PRICE OF AIRLINES TICKETS

Pranita Rajure[1], Samiksha Bankar[2,] Harsimran Bakshi[3], Bhakti Patil [4]
1, 2, 3 Student, Computer Department, AISSMSCOE
4 Faculty, Computer Department, AISSMSCOE

Abstract: Air passengers (the buyers) are often looking for the best time period to purchase airfares to get as much saving as possible while airlines (the sellers) always try to maximize their revenues by revising different prices for the same service. The airline implements dynamic pricing for the flight ticket. Flight ticket prices change during the morning and evening time of the day. Also, it changes with the holidays or festival season. There are several different factors on which the price of the flight ticket depends. The price of an airline ticket is affected by a number of factors, such as flight distance, purchasing time, fuel price, etc. The sellers have all the necessary information (for example historical sale, market demand, customer profile, and behaviour) to make the decision whether to increase or decrease airfares at different times prior to the departure dates. On the other hand, the buyers are only able to access limited information only which is not enough to predict the airfare prices. Considering the features such as departure time, the number of days left for departure and time of the day it will give the best time to buy the ticket. Features are extracted from the collected data to apply Machine Learning (ML) models. Then using this information, we
are intended to build a system that can help buyers whether to buy a ticket or not.

Keywords: Airfare price, Airfare changes, Machine learning algorithm, predictive models
International Journal for Research in Applied Science & Engineering Technology (IJRASET), ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429, Volume 9 Issue II Feb 2021- Available at www.ijraset.com

PREDICTION OF DOMESTIC AIRLINE TICKETS USING MACHINE LEARNING

Pranita Rajure1, Samiksha Bankar2, Harsimran Bakshi3, Bhakti Patil4
1, 2, 3Student,
4Faculty, Computer Department, AISSMSCOE

Abstract: Airlines usually keep their price strategies as commercial secrets and information is always asymmetric, it is difficult for ordinary customers to estimate future flight price changes. However, a reasonable prediction can help customers make decisions when to buy air tickets for a lower price. Flight price prediction can be regarded as a typical time series prediction problem. When you give customers a device that can help them save some money, they will pay you back with loyalty, which is priceless. Interesting fact: Fareboom users started spending twice as much time per session within a month of the release of an airfare price forecasting feature. Considering the features such as departure time, the number of days left for departure and time of the day it will give the best time to buy the ticket. Features are extracted from the collected data to apply Random Forest Machine Learning (ML) model. Then using this information, we are intended to build a system that can help buyers whether to buy a ticket or not. We have used Random Forest Algorithm which is a popular machine learning algorithm that belongs to the supervised learning technique. It can be used for both Classification and Regression problems in ML. It is based on the concept of ensemble learning, which is a process of combining multiple classifiers to solve a complex problem and to improve the performance of the model. With that said, random forests are a strong modelling technique and much more robust than a single decision tree. They aggregate many decision trees to limit over fitting as well as error due to bias and therefore yield useful results. Random forests are a combination of tree predictors such that each tree depends on the values of a random vector sampled independently and with the same distribution for all trees in the forest. The generalization error of a forest of tree classifiers depends on the strength of the individual trees in the forest and the correlation between them.

Keywords: Airline strategies, Airfare price prediction, Airfare changes, Random Forest algorithm, and predictive model.

International Journal for Research in Applied Science & Engineering Technology (IJRASET), ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429, Volume 9 Issue VI Jun 2021-

Look Profound Into Nature, and Afterward You Will Comprehend Everything Better
- Albert Einstein

EXPERIMENTAL INVESTIGATION OF FORMING PARAMETERS FOR SQUARE CUP DEEP DRAWING PROCESS

Dr. C.S. Choudhari, S.S. Khasbage

Abstract: Manufacturing a defect free drawn part is always challenging task. This paper presents numerical analysis and experimental validation of deep drawing process in order to avoid thinning and wrinkles. Numerical and experimental approaches are used to analyze the effect of different drawing parameters such as blank shape, blank thickness, load, dry/wet lubrication on square cup drawing process using extra deep drawn steel (EDD) sheet material. Results of simulation through computer aided engineering (CAE) software are validated through experimentation. Formability analysis on the laser engraved circular grids formed on the blank surface is carried out using forming limit diagram (FLD). The optimized process parameters helped to form a square cup without any defects such as thinning, wrinkling, etc. Experimental and formability analysis showed that for considered process parameters, formability of material having a blank thickness of 2mm is better as compared to a blank thickness of 1mm and 0.8mm, for load of 100 kN with dry lubrication. This work highlights the significance of forming limit diagram technique in strengthening numerical and experimental investigation of deep drawing process. In overall, this parametric study leads to prediction of final geometry of sheet blank accurately and distribution of strain and stresses, for the development of quality product through forming process.

Keywords: EDD steel; Square cup; Forming; CAE Software; Forming limit diagram.

Volume 44, Part 6 Pages 4261-4267 (2021),https://doi.org/10.1016/j.matpr.2020.10.543

ALOE E-CELL

Harshad sanjay jathot
FE Comp

Aloe E-cell is not just a project, it's a need of today. It is an eco-friendly approach to quench the thurst of your device.It is created using Aloevera and its world's 1st 100% eco-friendly on hazardous cell.It is created using herbal electrolyte Other than toxic materials.

How it works? Extract from aloevera is taken and added with few herbal constituents used in beauty products and medicines to make battery electrolyte by a method chemical energy from aloevera is converted in to electrical energy and stored in cells.

Disadvantages of using normal cells:

- Several disease which are caused due to prolonged exposure to cadmium, chromium and other harmful materials of the cell.
- E-waste resulting in various environmental problems like air, water and soil pollution.
- Material required to make this cells are imported from various countries which causes a economical pressure of more than148 billion dollars.

Advantages of Aloe E-cell:

- Cheaper than normal cells.
- Non-hazardous.
- Non-polluting to nature.
- Easily recycled.
- Safe to use. Eco-friendly.
- Help to reduce economic pressure.

Conclusion: When we talk about waste the major cause of waste also includes E-waste to which cells contribute the most. A report says that every year 50 million tonnes of E-waste is discarded. So in Aloe E cell because we are not using any chemical in the battery we are just using the herbal materials which after the use can be used as fertilizer for plants and coated metal will be used for making new cell.It is very cheaper as it costs 9-10 Rs. per cell.

CHALLENGES BEFORE GOVERNMENT

In a large and vivid democracy like INDIA, government needs to eradicate ample of problems that are either related to conscious topics or are general practices that are against any law but still being in practice in the name of religion. Some of these include child marriages, child labour and many more. Considering all of them and trying to reach the roots, we come to know that this all has been because of poor education and awareness. Reaching out people with technologies is an ease but doing similar act to make them realise about problems still remains a Mission Impossible. Scrutinizing different ways in which these problems are affecting society and development, we come up with our views to tackle them and making it our serious responsibility to contribute for the same.

Causes of illiteracy.

- Poor economic condition of many parents.
- Lack of awareness and circulation of books and study materials
- No personal guidance related to coping up with failure.
- Difficulty in living conditions, including poverty
- Learning disabilities such as dyslexia, Dysorthographia etc.

Effects of illiteracy.

- Limited ability to obtain and understand essential information
- UNEMPLOYMENT
- Lower income
- Lower quality jobs
- Reduced access to lifelong learning and professional development
- Precarious financial position.
- Little value is given to education and reading within family and this often leads to Inter-generational transmission of illiteracy
- Impact on health.

Solution for Eradicating Illiteracy.

- better education opportunities
- greater effectiveness at work
- greater competitiveness
- more dynamic enthusiastic workforce
- greater productivity
- Stronger economy.
- Better occupational health and safety record.
- Higher retention levels.
- Facilitate knowledge transfer from workers nearing retirement to employees of all ages.
- Work with families to keep child in school and prevent illiteracy.

- Give young people from underprivileged backgrounds the means of study.
- Enhance access to education for aboriginal people.

Child Labour.

Imagine what if someone takes away your child and forces him/her to work in somebody else home rather than play in the safety of their own, into illicit sexual trafficking, into acting like cattle in fields with harmful chemicals, to beg on the streets

Can You Imagine Your Child Like This?

Would You Be Able To Bear It?

More than 120 million parents have to go through this in India every year.60 million children in India are forced into degrading jobs every year This is the largest number of child labourers in a country and .... It is 6% of the population of India. This is also why your tax burden is so high less than 3% of India's population pays taxes.200-400 lakh crores this has resulted in a parallel economy of the 6 crore child labourers in India
Work for approximately 8 hrs. a day 200 days a year at cost of ₹15 per child per day.
200 days × ₹15 × 60 million = 18000000000
An adult would cost ₹115 per day.
200 days × ₹115 × 60 million = 1380000000000
THE DIFFERENCE...120000 crores
And 60 million adults out of jobs 6% of India's population, the unemployment rate in India is 3.8%

What Does This Mean?

If we are able to stop child labour. We will be able to get a job for everyone Substantially reduce the black money Indian Market, reduce taxes and create a bright future for India by saving child today. Call 1098 if you see a child being exploited

Today it is someone child tomorrow it could be yours.

Chawada Aryan Dhananjay
FE Civil-A

LIGHT FIDELITY (LI-FI)

Imagine a time when each of the light bulbs in your house is a source of Internet. Imagine a scenario where, standing under a light bulb for 1 minute, you would have downloaded around 5 movies in HD. Sounds like a dream, right? But thanks to Li-Fi technology, this dream will soon turn into reality. With this new technology, we can reimagine the role light plays in the universe.

What Is LI-FI?

Li-Fi (Light Fidelity) is a wireless optical networking technology that uses LEDs for data transmission. In simpler terms, Li-Fi is considered to be as a light-based Wi-Fi which uses light instead of radio waves to transmit information. It is a data communication variant which uses visible light between 44 and 800 THz.

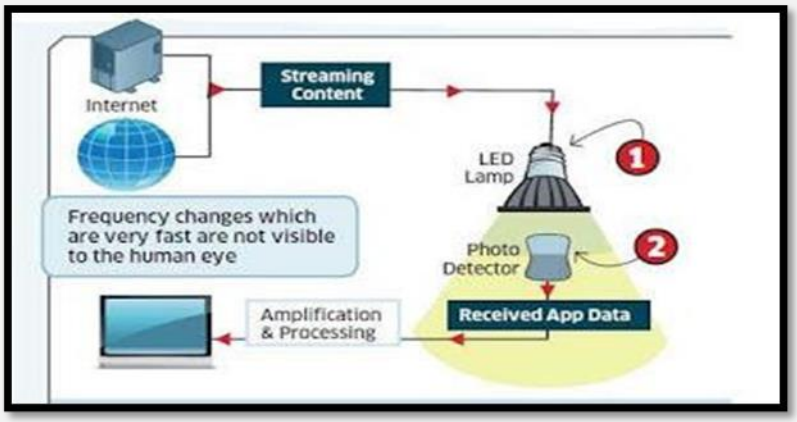
Need Of LI-FI:-

- LI-FI provides a faster medium for data transfer than the traditional provision of WI-FI, as the visible light spectrum is 10,000 times larger than radio waves and hence it can be 100 times faster than WI-FI.
- It is also considered safer than regular methods of data transmission.
- Health problems in humans and other living beings due to radiations can be eliminated.
- Spectrum crunch being the current problem with WI-FI, can be solved by LI-FI with broader ranges of spectrum.
- No Electromagnetic interference is also one of the benefits to avoid the data mutation.
- Also ever-increasing market share of LED's make VLC ubiquitously available.

How Does It Work:-

- When a constant current source is applied to an LED bulb, it emits a constant stream of photons observed as visible light.

- When this current is given a variation slowly and steadily, the bulb tends to dim up and down.
- As we all know, these LED bulbs come under the semiconductor photo-detector device and converted back to electrical current the current and optical output can be modulated at extremely high speeds which can be detected by a photo-detector device and converted back to electrical current.
- These LED bulbs thus can be switched on and off at an instant.
- This process is so quick that the human eye cannot even detect it.
- The photo receivers that receive these light signals covert the data sent into actual stream able content.



Applications of LI-FI:-

- *Street And Traffic Light*
- Li-Fi can even work for Underwater ROVs (Remotely Operated Vehicles) where Wi-Fi fails completely, thereby throwing open endless opportunities for military underwater applications.
- As light is everywhere and free to use, there is a great scope for the use and evolution of Li-Fi technology.
- If this technology matures, each Li-Fi Bulb can be used to transmit data. As the Li-Fi technology becomes popular, it will lead to a cleaner, greener, economical, and safer communication system.
- Although Li-Fi promises to solve issues such as, shortage of radio-frequency bandwidth and eliminates the disadvantages of radio communication technologies, but it is also associated with short range and the need of a light source.
- As such Li-Fi is not likely to replace Wi-Fi completely, but the use of two together i.e. Wi-Fi and Li-Fi can prove to improve quality of life.

Advantages:

- Transmission Speed
- Used In Certain Places Sensitive to EM.
- Can Operate In A Non-visible Way.
- Cheap to implement as transmission is through light.
- Broader Bandwidth

Disadvantages:

- Ranges limitations.
- Presence of light is essential.
- There should be line of sight
- Works better with fluorescent light and leds but very low efficiency with bulb.
- Restricted bandwidth

Comparison between WI-FI & LI-FI:-

Characteristics	WI-FI	LI-FI
Frequency	5 GHZ	
Standard	IEEE 802.11	IEE 802.15
Range	100 meters	Based on LED Light
Primary Application	Wireless Local Area Networking cost Low Medium High	Wireless Local Area
Data Transfer Rate	800 Kbps-11 Mbps	>1 Gbps
Power Consumption	Medium	Low
Cost	Medium	High
Security	It's Mediumly Secured	It's Highly Secured

Conclusion:-

- Li-Fi is the upcoming and on growing technology acting as competent for various other developing and already invented technologies.
- The possibilities are numerous and can be explored further. If this technology can be put into Practical use, every bulb can be used something like Wi-Fi a hotspot to transmit wireless and we will data proceed towards the cleaner, Greener, Safer and Brighter future LI-FI.

Saurabh Relekar.
FE CIVIL "B"

ADDITIVE MANUFACTURING

Phade Rushi, Prathmesh Pokale, Raghuvanshi Vaibhav, Rajale Chitra, Rajebhosale Arya
FE Mech B

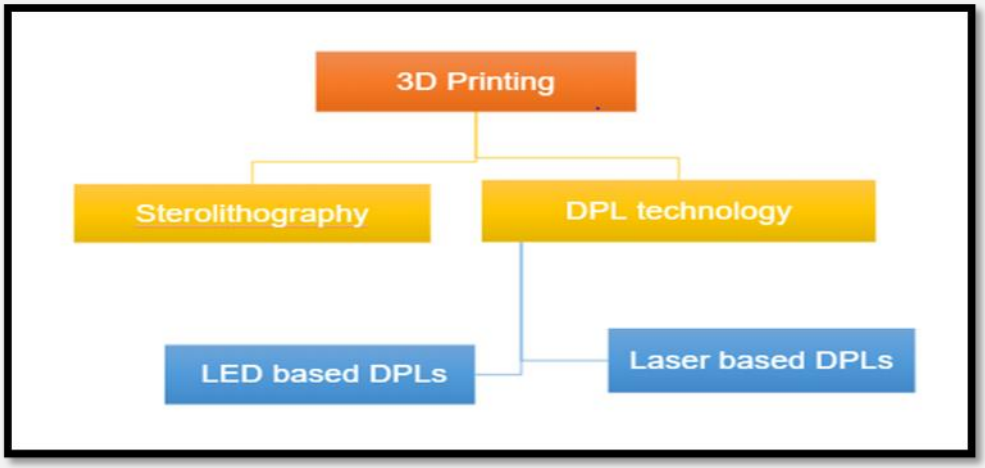
What is Additive Manufacturing and its uses?

Additive Manufacturing refers to a process by which digital 3D design data is used to build up a component in layers by depositing material. The term "3D printing" is increasingly used as a synonym for Additive Manufacturing.

However, the latter is more accurate in that it describes a professional production technique which is clearly distinguished from conventional methods of material removal. Instead of milling a work piece from solid block

3D Printing Technology

- 3D printing or additive manufacturing is a process of making three dimensional solid objects from a digital file.
- In an additive process an object is created by laying down successive layers of material until the entire object is created.
- A 3D printer is a type of industrial robot.



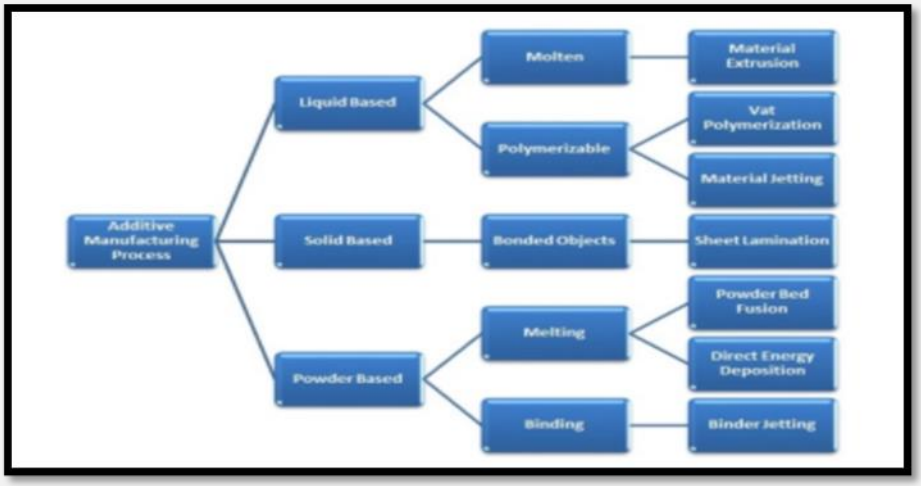
How Does 3D Printing Work?

Step 1
• It all starts with making a virtual design of the object you want to create. This virtual design is made in a CAD (Computer Aided Design).

Step 2
• Once completed, the STL file needs to be processed by a piece of software called a "slicer," which converts the model into a series of thin layers and produces a G-code file.

Step 3
• This G-code file can then be printed with 3D printing software.

Additive Manufacturing Processes Along With Classes of Materials and Method of Deposition



Advantages and Disadvantages of Additive Manufacturing

Advantages

- Freedom of design
- Complexity for free
- Potential elimination of tooling
- Lightweight design
- Elimination of production steps

Disadvantages

- Slow build rates
- High production costs
- Considerable effort required for application design
- Discontinuous production process
- Limited component size.

Applications of Additive Manufacturing

- Prototyping And Manufacturing
- Medicine
- Construction
- Art And Jewellery
- Education

HYDROGEN FUEL CELL VEHICLES REPORT

Sumeet Irale, Siddhesh Patil, Yash Patil, Prathamesh Late, Abhishek Kulkarni,
Jayesh Bhosale, Niranjan Urkude
FE Mech s/w

Fuel cell electric vehicles (FCEVs) are powered by hydrogen. They are more efficient than conventional internal combustion engine vehicle sand produce no tailpipe emissions-they only emit water vapor and warm air. FCEVs and the hydrogen infrastructure to fuel them are in the early stages of implementation. The U.S. Department of Energy leads research efforts to make hydrogen-powered vehicles an affordable, environmentally friendly, and safe transportation option. Hydrogen is considered an alternative fuel under the Energy Policy Act of 1992 and qualifies for alternative fuel vehicle tax credits.

What are the risks of hydrogen fuel cell cars?

In hydrogen fuel cell cars, the hydrogen is stored in liquid form in thick-walled tanks that are particularly safe. As Rucker emphasizes, numerous crash tests have confirmed the safety of how hydrogen cars are designed: the tanks came out of the tests undamaged and no hydrogen leaked. We should also not forget that hydrogen technology is not new, but is tried and tested in a range of fields. By way of example, refineries today use large quantities of hydrogen as a process gas in the processing of crude oil. Pipelines and hydrogen storage have also been in operation for decades.

Construction: Hydrogen fuel cell cars are powered by an electric motor and are therefore classified as e-cars. The common abbreviation is FCEV, short for "Fuel Cell Electric Vehicle," in contrast to a BEV or "Battery Electric Vehicle." In fuel cell technology, a process known as reverse electrolysis takes place, in which hydrogen reacts with oxygen in the fuel cell. The hydrogen comes from one or more tanks built into the FCEV, while the oxygen comes from the ambient air. The only results of this reaction are electrical energy, heat and water, which is emitted through the exhaust as water vapor. So hydrogen-powered cars are locally emission-free – more about that in a minute.

Working: Like other e-cars, hydrogen vehicles can also recover or "recuperate" braking energy. The electric motor converts the car's kinetic energy back into electrical energy and feeds it into the back-up battery. The electricity generated in the fuel cell of a hydrogen engine can take two routes, depending on the demands of the specific driving situation. It either flows to the electric motor or powers the FCEV directly or it charges a battery, which stores the energy until it's needed for the engine. This battery, known as a Peak Power Battery, is significantly smaller and therefore lighter than the battery of a fully electric car, as it's being constantly.

Advantages

- Advantage is the quick charging time. Depending on the charging station and battery capacity, fully electric vehicles currently require between 30 minutes and several hours for a full charge. The hydrogen tanks of fuel cell cars, on the other hand, are full and ready to go again in less than five minutes. For users, this brings vehicle availability and flexibility into line with those of a conventional car.
- For the time being, hydrogen cars still have a longer range than purely electric cars. A full hydrogen tank will last around 300 miles (approx. 480 kilometers). Battery-powered cars can match this with very large batteries – which in turn will lead to an increase in both vehicle weight and charging times.

Disadvantages:

- Currently, the biggest shortcoming of hydrogen fuel cell cars is the sparsity of options for refueling. A hydrogen engine is refueled at special fuel pumps, which in the future will probably find their way into ordinary service stations. As things stand, however, there are still very few refueling stations for hydrogen-powered cars.

Applications:

- Toyota had started testing of Mirai a sedan car with hydrogen fuel and achieved a highest record of range that is 1000 km and can be launched in international market soon.
- Also Hyundai had started testing of Nexo a SUV with hydrogen fuel and achieved a second highest record of range that is 800 km and can be launched in international market soon.

Cost Estimation:

How Much Do Hydrogen-powered Cars Cost – And Why?

In Addition to the Thin Fueling Station Network, There Is another Reason For The As Of Yet Low Demand for Hydrogen Fuel Cell Cars: They Are Relatively Expensive To Buy. The Few Models of Fuel Cell Vehicles Already Available on the Market Cost around USD 80,000 for a Mid- Or Upper-mid-range Vehicle. That's Almost Twice As Much As Comparable Fully Electric or Hybrid Vehicles.

"Arise, awake and Stop not until the goal is reached."

- Swami Vivekananda.

POWER GENERATION ON HIGHWAY BY SAVONIUS WIND TURBINE

Ashutosh Kamble, Sagar Lambhate, Vaibhav Bhoite, Nikhil Thorat, Amar Tambul, Atharva Kadam
FE Electrical

Wind energy is considered the fastest growing clean energy source. In today's life the demand on electricity is much higher than that of its production. In this 21st century there are many methods to produce energy. In renewable energy field sector, wind turbines play an important role in energy production. The employment of wind energy is expected to increase dramatically over the next few years according to data from the Global Wind Energy Council. A major issue with the technology is fluctuation in the source of wind. Power has been extracted from the wind over hundreds of years with historic designs, known as windmills, constructed from wood, cloth and stone for the purpose of pumping water or grinding corn. Historic designs, typically large, heavy and inefficient, were replaced in the 19th century by fossil fuel engines and the implementation of a nationally distributed power network. A greater understanding of aerodynamics and advances in materials, particularly polymers, has led to the return of wind energy extraction in the latter half of the 20th century.

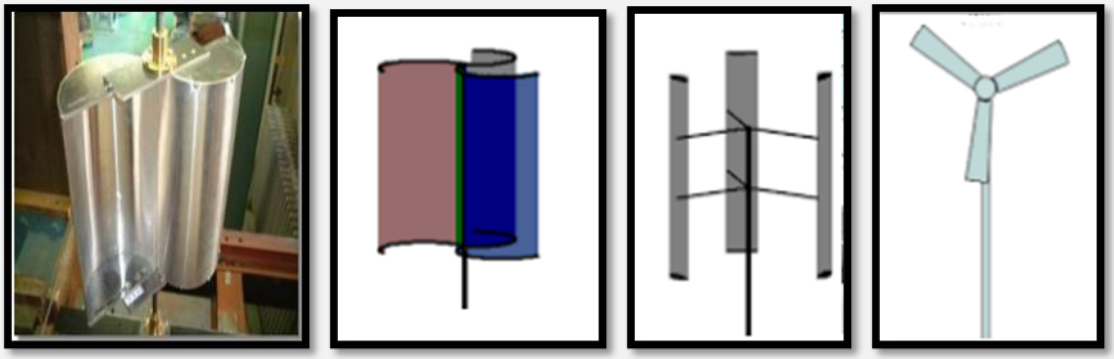
Wind power devices are now used to produce electricity, and commonly termed wind turbines. The orientation of the shaft and rotational axis determines the first classification of the wind turbine. A turbine with a shaft mounted horizontally parallel to the ground is known as a horizontal axis wind turbine or (HAWT). A vertical axis wind turbine (VAWT) has its shaft normal to the ground (Figure 1).

The two configurations have instantly distinguishable rotor designs, each with its own favourable characteristics

[1]. the discontinued mainstream development of the VAWT can be attributed to a low tip speed ratio and difficulty in controlling rotor speed. Difficulties in the starting of vertical turbines have also hampered development, believed until recently to be incapable of self-starting

[2]. However, the VAWT requires no additional mechanism to face the wind and heavy generator equipment can be mounted on the ground, thus reducing tower loads. Therefore, the VAWT is not completely disregarded for future development. A novel V-shaped VAWT rotor design is currently under investigation which exploits these favourable attributes

[3]. this design is currently unproven on a megawatt scale, requiring several years of development before it can be considered competitive. In addition to the problems associated with alternative designs, the popularity of the HAWT can be attributed to increased rotor control through pitch and yaw control. The HAWT has therefore emerged as the dominant design configuration, capitalized by all of today's leading large scale turbine manufacturers.



VERTICAL AXIS WIND TURBINE **HAWT**

Methodology:

Fabrication of vertical axis wind turbine (Savonius type) consists of different parts which are needed to be fabricated as parts of main assembly. Following are the parts of VAWT, to be fabricated:

- Base- The base is made of plywood 6 feet long and 3 feet wide with 1inch thickness. Fabrication of base aims at providing a strong support to the turbine against the high speed wind. It is designed in such a way as to reduce the vibrations of the turbine due to turbulent winds. The base holds the rotor with fixed shaft perpendicular to rotor. The base also holds the power generating unit.
- Frame- The frame is made using mild steel rectangular [20cm*40cm] pipes. Two six feet long pipes are attached perpendicular to the base. Two four feet long pipes are attached parallel to the base. These rectangular pipes are attached using L clamps with suitable nut and bolts. The frame is designed in such a way as to provide required strength and support to the turbine against the rotation of blades and force of wind.
- Blades- In this project 5 inch, half cut PVC pipes are used as turbine blades. The blades are approximately 3mm thick. Five blades of equal length are being used. The analysis is made using a set of three, four and five blades. These blades are attached perpendicular to the rotor [cycle wheel] using clamps with nut and bolt arrangement.
- Rotor- Two front wheels of the cycle are used as the rotor. These wheels are made up of stainless steel material in order to resist the corrosion. The diameter of the wheels is 300 cm. These wheels consist of ball bearing which allows easy rotation. These wheels are attached one to the top of frame and other to the base. They are supported by the fixed shaft.
- Generator- Dynamo of car is used to produce electricity of 12 volts.

Working:

Here the Kinetic Energy from wind force produced due to the fast-moving vehicles from both lanes, forces the wind turbine to rotate in clockwise direction with certain rpm. This in turn forces the alternator to rotate in same clockwise direction with 10 times

faster than the turbine speed, thus generating electricity which is stored in 12 volt car battery. This energy can be multiplied by implementing a series of wind turbines. The stored energy can be utilized for smart tollbooth system, smart toilets, highway lightening, etc.

Advantages:

- The Savonius design works well even at low wind speeds, there's no need for a tower or other expensive structure to hold it in place, greatly reducing the initial setup cost.
- The device is relatively small compared to other turbines. Because the turbine is close to the ground, maintenance is easy.
- Easy installation as compared to other wind turbines.
- The equipment no longer relies on natural wind convections it relies on the induced turbulence in the vicinity of moving vehicle.
- Parts for controlling pitch and yaw aren't needed either.
- They function in weather changes.
- Scalability: The design can be scaled down on larger amount on highways, which can eventually light up Rural areas

Disadvantages:-

- Less Rotation Efficiency Vertical axis wind turbines often have less rotation efficiency. This is part of the reason why vertical axis wind turbines have lower efficiency.
- Lower Available Wind Speed Since vertical axis wind turbines are typically installed on ground level, they do not harness higher wind speeds often found at higher levels. Consequently, less wind energy is available for ground-level vertical axis wind turbines. A common solution to this is to install the turbine on the rooftop of a building.

- Component Wear-down often placed on ground level and populated environments, vertical axis wind turbines face more turbulence and issues of vibrations.
- Less Efficiency Vertical axis wind turbines are known to have less efficiency compared to horizontal axis wind turbines. This is mainly due to the nature of their design and operational characteristics.

Applications:-

- The Savonius vertical axis wind turbine designed can be located at the highways medians to generate electricity, powered by artificially created wind.
- The heavy vehicle movement gives it an advantage for more wind opportunity. With the idea of putting it on highway medians, it will power up street lights and or commercial use.
- This turbine can also be a barrier for the high intensity light coming from the vehicles of other lanes and hence reduce the risk of accidents.
- The obtained energy can be multiplied by placing the wind turbines in series. In most cities, highways are the faster routes, so this energy can be efficiently used for many purpose.

SMART-FLOWER- SOLAR TRACKING SYSTEM

Chavan Abhishek ,Chavan Rohit ,Chavan Suyash,Chawada Aryan,Chitte Chinmay,Kulkarni Sakshi
FE Civil A

Smart flower was founded in Austria, a country steeped in a heritage of design, innovation, and manufacturing excellence. Energy Management Inc. (EMI), a Boston, MA corporation with over 43 years of experience developing large energy projects, acquired Smart flower in 2018.

Solar tracking system:

- Renewable energy solutions are becoming popular.
- Maximizing output from solar system increases efficiency.
- Presently solar panels are of fixed type which lower the efficiency.
- Maintaining vertical direction between light and panel maximizes efficiency.
- Solar tracking system has 35% higher generating power than fixed.
- Solar tracking system based on PLC can adjust automatically orientation of panel

Solar smart flower is designed to have six main parts consist of fin diesel nine units, body battery, hinge buffer, base, hinge base, and fin with hinge 1 unit. This Smart flower can open and close focus horizontally 360 degrees, you can move up and down vertically 270 degrees vertically.

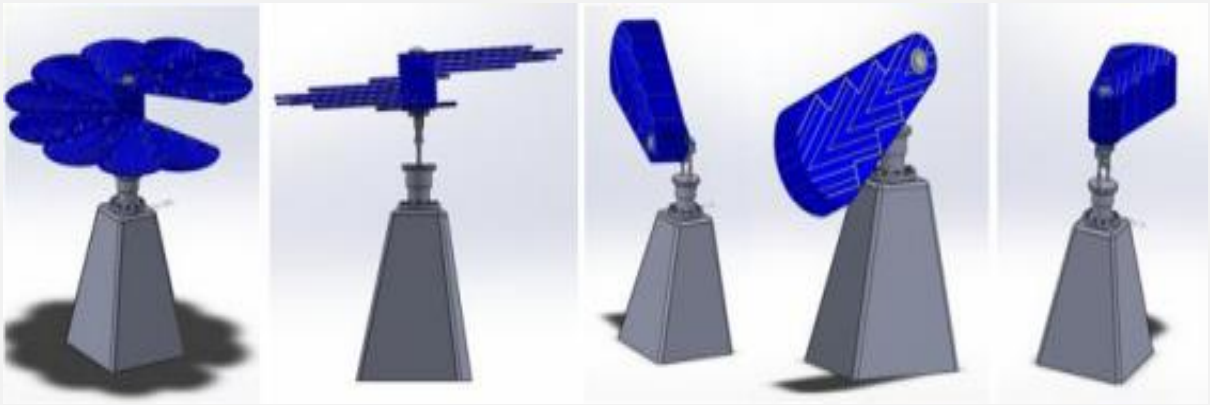


Fig - Designed full assembly of the solar smart-flower

Advantages:-

- Simple
- Eco-Friendly
- We can monitor directly using PC
- Tracking accuracy is more

- Reduce the usage of power from power grid.

Disadvantages:-

- Solar electricity is not available at night and is less available in cloudy weather conditions. Therefore, a storage or complimentary power system is required.
- Limited power density.
- Solar cells produce DC which must be converted to AC when used in currently existing distribution grids

Applications:-

Some of the common usage of Smart-flower energy are water heating, making coffee, and running. Also, with a day's output, consumers of Smart-flowers can do the following:

- Charge an electric vehicle that can drive up to 62 miles
- Charge as many as 2,400 smartphones
- Binge watch 360 hours of television Wash nearly 17 loads of clothes
- Power LED lights for over 4,300 hours.

The Environment Is The Place We As A Whole Meet ; Where All Have A Common Intrigue ; It Is The One Thing We All Offer

-Lady Bird Johnson

RECENT ADVANCEMENT IN BIOGAS ENRICHMENT AND IT'S APPLICATION

Aditya Shinde, Ashish Bhandari, Mayur pathade, Yash Jain
FE Chemical

Energy is the backbone of developing countries like India. Conventional energy sources such as crude oil, coal and natural gas are used to fulfill increasing demands, but these resources are exhausting rapidly with pace of the time; worldwide primary energy consumption has grown by 0.9% in 2014. It is clear that renewable energy sources like biogas, biomass, wind and solar supply 14% of total world energy demand. Biogas is generated from anaerobic digestion of organic compounds such as food wastes, cellulosic biomass, and animal waste. Nowadays, it is not only used for cooking but also used for vehicular operations and electricity generation. According to Agstar report, anaerobic digestion plants have a capability to generate 13 million megawatt hour per annum in USA. In India, Ministry of New and Renewable Energy had set a target to achieve 48.55 MW energy from biogas plants till 2022. There is the tremendous potential in India as well as rest of the world in employing anaerobic digestion as waste treatment method as well as an energy production technology. Anaerobic digestion is a series of biological processes, in which micro-organisms breakdown of bio-degradable material in the absence of oxygen. It involves a series of bio-chemical processes such as hydrolysis, acidogenesis, acetogenesis and methanogenesis. There is a lot of research done on variety feedstock for anaerobic digestion. Methane yields from corn Stover, wheat straw and switch grass were 2–5 times higher than those farm yard wastes, waste paper had methane yield of only 15 L/kg VS and pine had only 17 L/kg.

Pressurized water scrubbing:

- Pressurized water scrubbing is most commonly followed for biogas Purification. The CO2 and H2S are easily soluble than CH4 and easy to Operate.
- The only disadvantage of the system is that lot of water required even with regeneration.
- Current study on pressurized water scrubbing focuses on low water Usage and high pressure application.

Pressure swing adsorption:

- Pressure swing adsorption is a process by which gases species from the mixture of gases can be separated.
- This method can be adapted to separate gas mixture because different gases tends to attracted to different solid surfaces.
- The results showed that the obtained bio-methane is of high Purity of 98%. This method is second most popular after water Scrubbing.

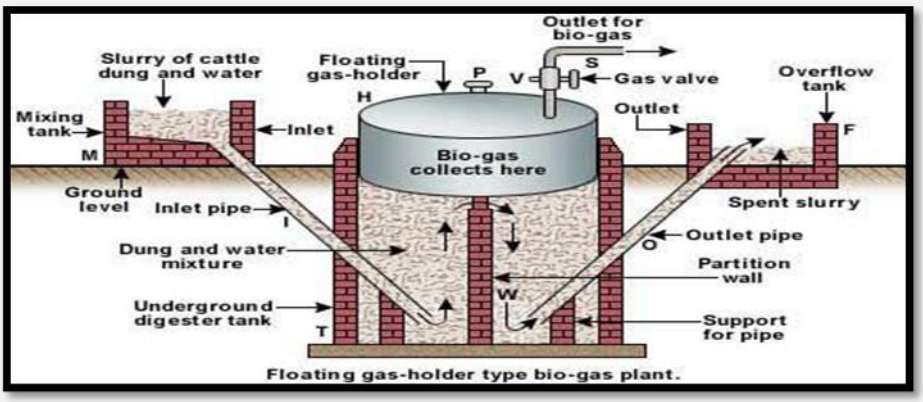
Membrane permeation:

- Permeation is also known as imbuing is the penetration of permeate Such as liquid gas or vapors through solid.
- Permselective membranes were used for removal of CO2 and H2S, Ultrathin polymer membranes have been found extremely effective for Purification.
- The disadvantages of membrane separation are relatively low CH4 yield and high membrane cost.

Bio filters:

Bio filtration is a pollution technique which uses living material to capture biologically degradable pollutants. This bio filters are commonly used for processing waste water, capturing harmful chemicals and capturing contaminants from air.

Construction:



Advantages:

- Renewable Source of Energy. Utilization of Waste.
- Produces a Circular Economy.
- A Good Alternative for Electricity and Cooking in Rural Areas and Developing Countries.

Disadvantages:

- Few Technological Advancements. An unfortunate disadvantage of biogas today is that the systems used in the production of biogas are not efficient.
- Contains Impurities.
- Effect of Temperature on Biogas Production .Less Suitable For Dense Metropolitan Areas.

Applications: Biogas is used to generate electric power as decentralized source of energy in several countries. Biogas-fuelled engines can be used for water pumping, crop processing and power generation.

UTILISATION OF WASTE PLASTIC IN MANUFACTURING OF BRICK ALONG WITH QUARRY DUST AND M SAND.

Kunal Thorat, Sudhakumari Paswan, Darshansing Patil, Soham Sarphale, Siddhesh Warule
FE Civil B

Utilization of Plastic waste for Making Plastic Bricks: Plastic is the very hazardous material and very difficult to decompose it is main problem in the world. Use of plastic is high in our daily life such as polythene bags, disposals, furniture's, packing food packets and other accessories. Plastic is vary in large and various types according to their chemical composition. So, to separation of plastic wastes and mainly big problem in front of us. Nowadays, In the world plastic deposited by burning procedure. They emit large amount of hazardous and toxic gases. These gases effect on the human health and also living animals. Human suffers by the toxic gases such as cancer, high blood pressure, Asthma,etc.We are not completely able to stop the use of plastic but we are able to recycle and reuse it by many ways and minimum effect on environment. We use such recycle plastic in the various industries such as construction, transportation, manufacturing .etc. In construction industry, larger cost of project is include in materials up to 60% to 70%of the total cost of the project. So, construction industry large amount of bricks are used and they available in various forms such as clay bricks, concrete bricks, fly ash bricks and foam bricks. In this project, we try to use wastes plastic to manufacture the bricks and increase the strength and achieve economy so the people can easily afford this type of bricks.

Advantages:

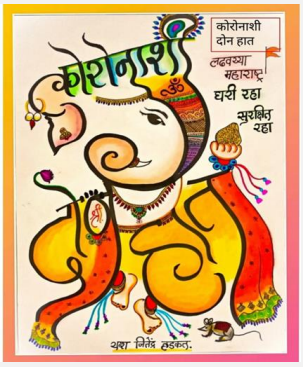
- Allow recycling of waste plastic.
- If made with hollow cells, they can be filled with compacted dirt, increasing their Potential utility for projects lasting several years.
- They can be used for insulation. They should be sufficiently economical, with potential for easy recycling.
- Under submerged conditions they should last much longer.
- Exotic shapes are possible for decorative purposes.
- Overall cost of brick will be reduced.

Disadvantages

• Mortar would not stick, unless they are designed with specialized rough surface
• Plastic may appear strong, but it would deform under pressure.
• Limited lifespan due to degradation by UV.

Applications:-

• Plastic sand wall in framed structures as a partition wall.
• Plastic sand benches in the parks.
• Plastic sand tracks for running and jogging in place of concrete or stone tracks.



So friend's it's time to total reconstruction of our life's and all of us are back to square one to learn the elementaries of human life and living which we had forgotten and totally we are suffering collectively, it's like the common air we breathe ,as the way we exploited the mother earth.

We all been punished together we all are gone back to primary school of life, why should some of us have suffered when we doesn't deserve it if some of us who lived the honest way should we suffered but that's the bane and bonus of the global world, the global society we all become one in joys and sorrow, some of us who doesn't deserve it are suffering too we all are part of it, the world is suffering together.

I think the Indian Spirituality of humanity needs to come to the force, the yoga of India needs to come to the fore just as the India's Namaste as come to the fore and not masculine hand shake, the gentle Namaste were I bow towards the divinity within you and you bow towards the divinity within me.This is Indian civilization, Indian spiritually how do you be the better human being before we think of accumulation, acquisition, consumption it's time to collaborate and have a collective will in peace ,harmony and humanity it's time to humanity to be return and also to be recognized too, rather than glamour only I think we all are at a stage of tremendous rebuilding and reconstruction of life a chapter of history it has too be freshly designed ,freshly worked, freshly addressed ,freshly learned.

Yash Jitendra Ladkat
FE Chemical

Situations before and after Industrialization

Sakshi R. Thorat
Fe Electrical

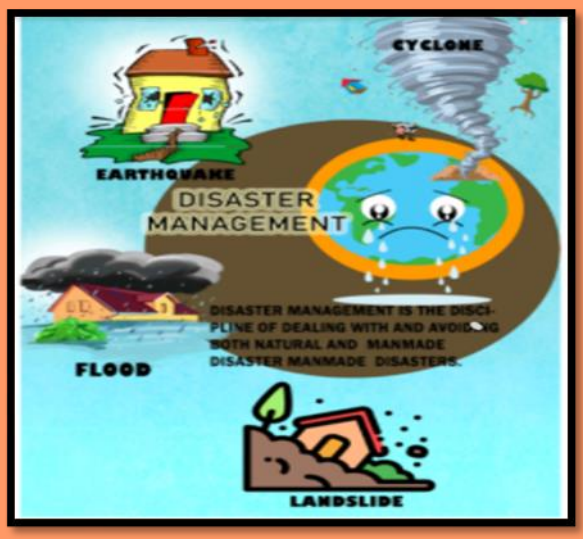
Vishal Singh
FE Civil B

Prerana Harish Somaiya
FE Civil B

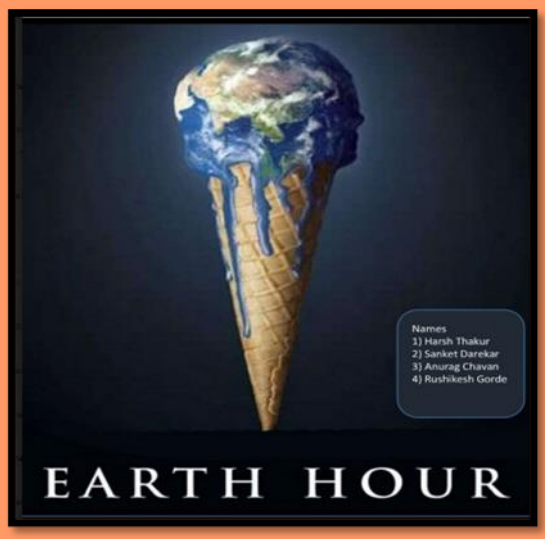
Kiran Phadtare
FE Civil B

WARANG GAURI NANDKISHOR (FE CIVIL B)

PANDIT ONKAR SHRINIWAS (FE CIVIL B)



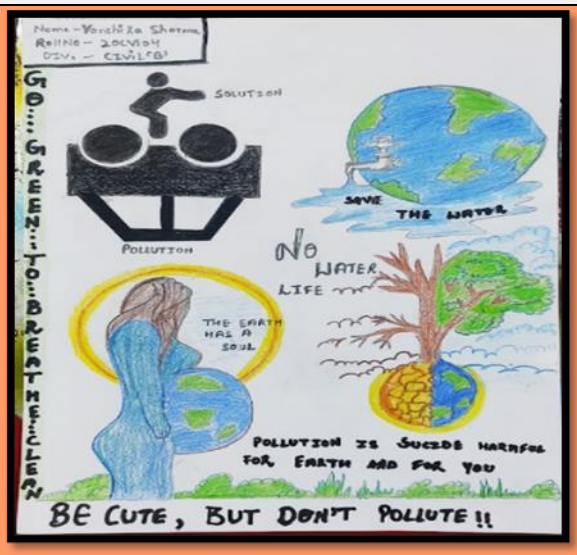
NIKHIL,SAURABH,ADVAIT,OMKAR (FE MECH A)



HARSH,SANKET,ANURAG,RUSHIKESH (FE MECH A)

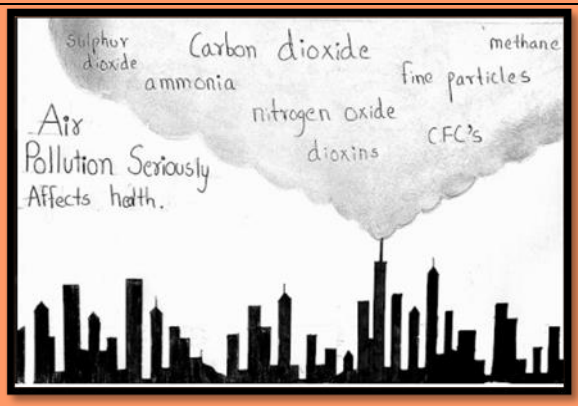
KIRAN PHADTARE (FE CIVIL B)

PHULE ADITYA JAYDIP (FE CIVIL B)



SHARMA VANSHIKA(FE CIVIL B)

PAWAR VEDANG MADHUKAR(FE CIVIL B)



WAYAL KSHITIJ NITIN (FE MECH B)

SAWANT ATHARVA RAKESH (FE MECH B)

RANE BHARGAV DEVENDRA (FE MECH B)

YASH AMOL CHAUDHARI (FE MECH B)

SALVI NEEL SANTOSH (FE MECH B)

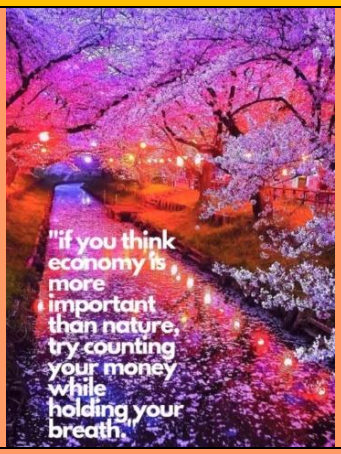
PASWAN SUDHAKUMARI PRAKASH (FE CIVIL B)

SARPHALE SOHAM SANDEEP (FE CIVIL B)

SOMAIYA PRERANA HARISH (FE CIVIL B)

SLOGAN MAKING ACTIVITY ON NATURE

JOTSNA SONAR (FE E&TC)



ATHARVA GOKHARE (FE COMPUTER-A)

SAKSHI DIVATE (FE COMPUTER-A)

PRATHMESH SHAHAPURE (FE E&TC)

ADITYA SHINDE (FE COMPUTER-A)

SAKSHI NAIK (FE E&TC)

GAURAV LONDHE (FE E&TC)

SAIFODDIN KAZI (FE E&TC)

ATHARVA KADAM (FE E&TC)

AKSHAY HIRAVE (FE E&TC)

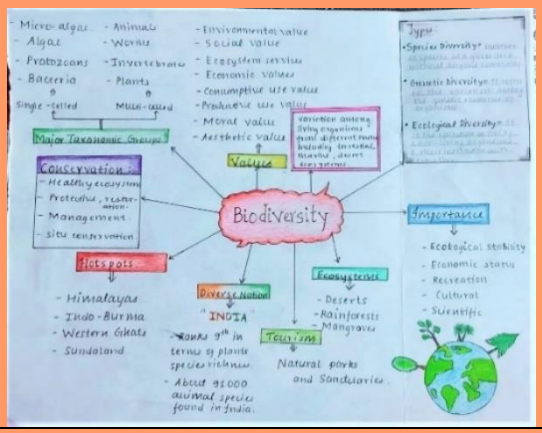
ADITYA PAWAR (FE E&TC)

ANJALI JAGTAP (FE E&TC)

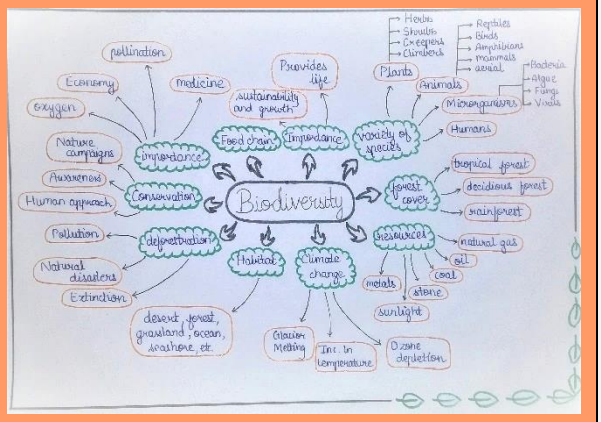
KETAKI NANAWARE (FE E&TC)

MANALI JADHAV (FE E&TC)

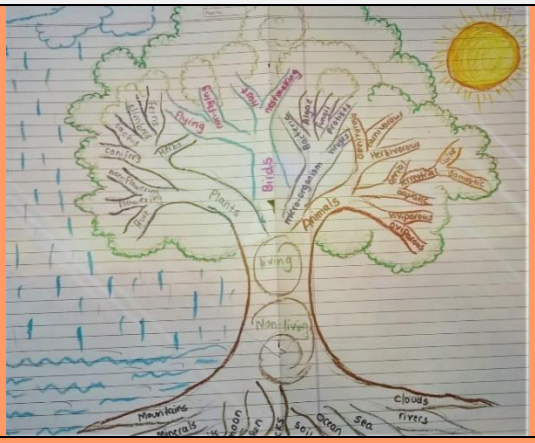
MIND MAPPING ACTIVITY ON BIODIVERSITY



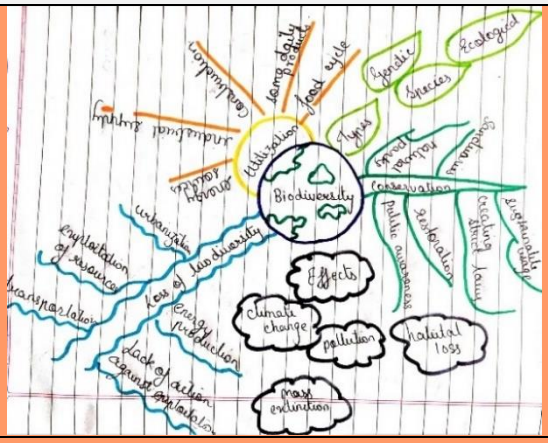
VISHWAJA KADU (FE E&TC)



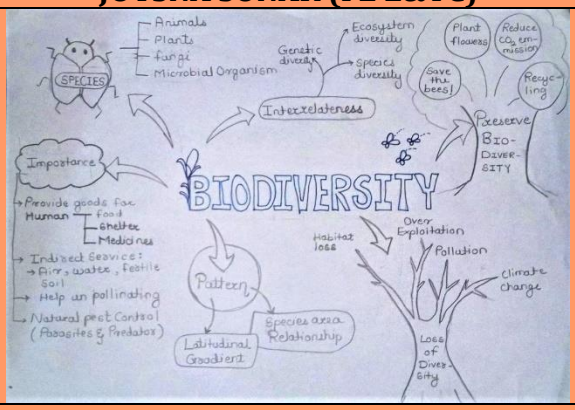
SIDDHI MORE (FE E&TC)



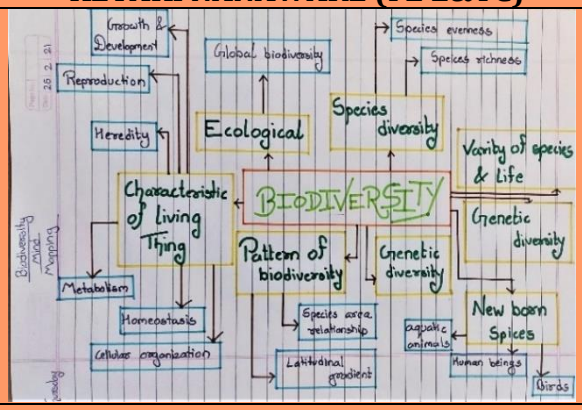
JOTSNA SONAR (FE E&TC)



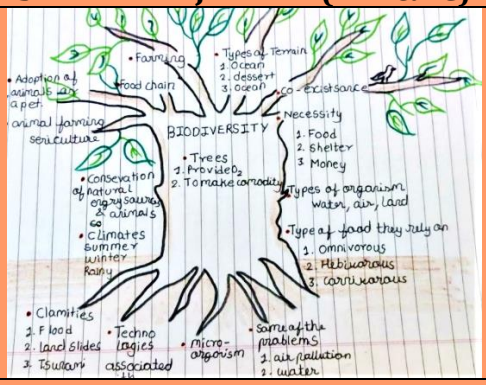
KETAKI NANAWARE (FE E&TC)



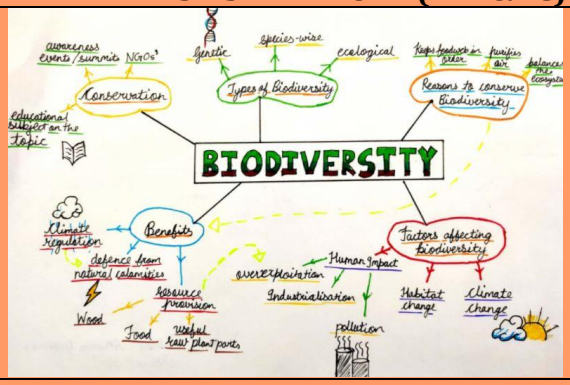
SHRADDHA JADHAV (FE E&TC)



PRATHMESH SHAHAPURE (FE E&TC)



ATHARVA CHIRMURE (FE COMPUTER-A)



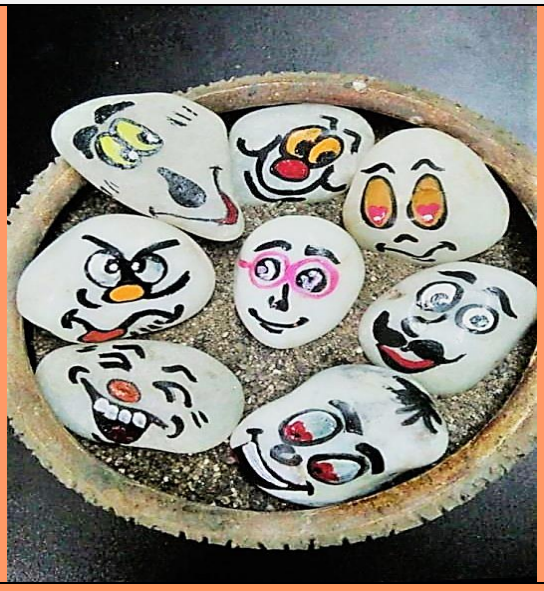
ATHARVA GOKHARE (FE COMPUTER-A)

BEST OUT OF WASTE ACTIVITY

ADITYA SHINDE (FE COMPUTER-A)

PRATHMESH SHAHAPURE (FE E&TC)

	
MOHD. AQIB (FE E&TC)	**JOTSNA SONAR (FE E&TC)**
	
ATHARVA SHELKE (FE E&TC)	**RUTHVIK KAMBLE (FE E&TC)**
	
ATHARVA HAPSE (FE E&TC)	**MAITHILI GUJAR (FE E&TC)**

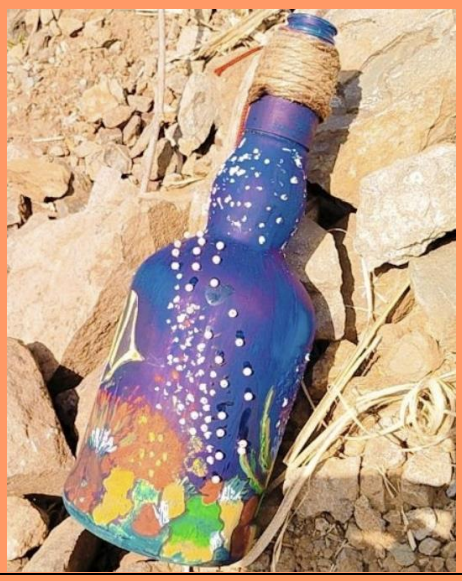


VISHWAJA KADU (FE E&TC)

PRITI SAGAR (FE E&TC)

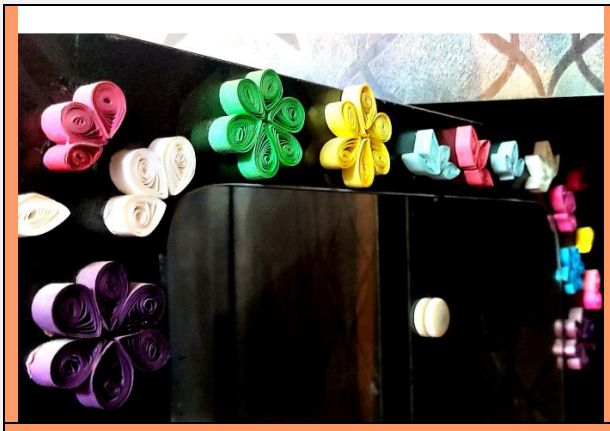
SIDDHI MORE (FE E&TC)

PRANAV DESAI (FE E&TC)



MANALI JADHAV (FE E&TC)

KETAKI NANAWARE (FE E&TC)



VISHAL DESHPANDE (FE E&TC)

PRAVEEN CHOUDHARY (FE E&TC)

SHASHIRAJ SAHANI (FE E&TC)

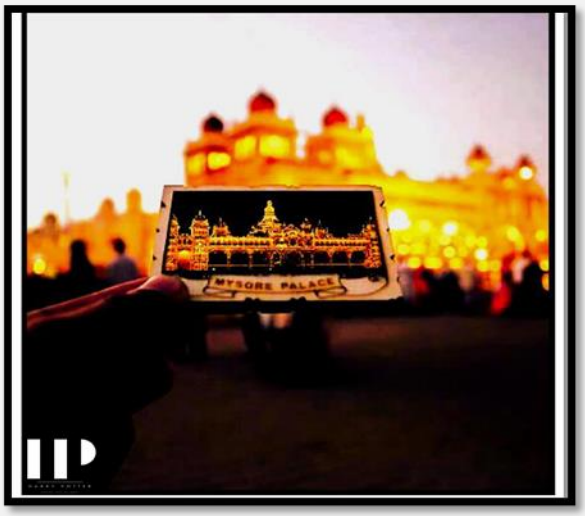
SHLOK GUPTA (FE COMPUTER)

RAJWEE WABLE (FE E&TC)

KUNAL JADHAV (FE COMPUTER-A)

SUNSET IS SO MARVELOUS THAT EVEN THE SUN ITSELF WATCHES IT EVERYDAY IN THE REFLECTIONS OF THE INFINITE OCEANS

A THOUGHTFUL MIND,WHEN IT SEES A NATION'S FLAG,SEES NOT THE FLAG BUT THE NATION ITSELF



THE PESSIMEST SEES DIFFICULTY IN EVERY OPPOURTUNITY.THE OPTIMIST SEES OPPOURTUNITY IN EVERY DIFFICULTY

SOME BEAUTIFUL PATHS CAN'T BE DISCOVERED WITHOUT GETTING LOST

Soham Joshi
FE Civil A