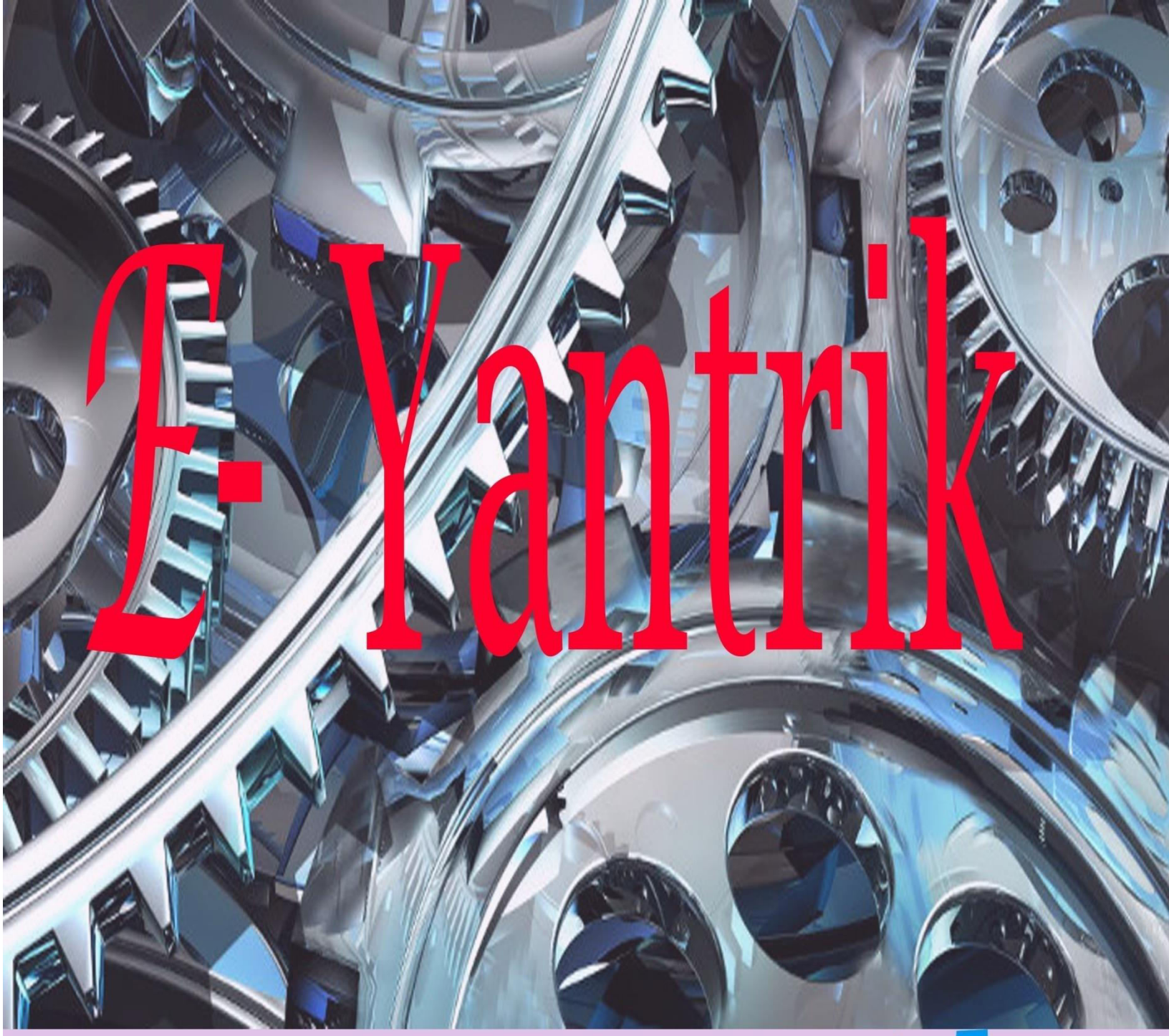

E-Yantrik

Volume: 4

2nd :Issue

GIFT

Student Editors: **Anil Sahoo**

Bigyan Sarathi Das

Faculty Editor: **Ayusman Nayak**

E-YANTRIK

Vol: 4 ISS:2

Vision of the Department:

To become a centre of excellence, acclaimed globally as a source of knowledge in the field of Mechanical Engineering by producing the professionals of highest grade to excel in the field of Industry and Research, bearing the ability to face the challenges posed by latesttechnology and competition.

Mission of the Department:

- To impart quality education to the students and enhance their knowledge and skills to make them globally competitive Mechanical Engineers.
- To become a leader in the field of Mechanical Engineering by acquiring and disseminating knowledge, using the best methods of teaching.
- To develop linkages with Industrial and Research organizations, enterprises in India for industry-oriented projects to apply theoretical knowledge to practical problems.
- To develop entrepreneurship skill of the students to make them ready for self-employment.

PEO's of the Department

Program educational objectives of Undergraduate Mechanical Engineering Department are:

- PEO-1 : Our graduates will succeed as a mechanical engineer or obtain an advance degree by applying basic principles of engineering and skills to solve complex engineering problems.
- PEO-2 : Our students will be able to carry out Multidisciplinary research using modern tools and adapt to current changes by inculcating habit of lifelong learning.
- PEO-3 : Our Students will be able to work in the field of clean energy for the welfare of the society as responsible citizens with good ethics.

From the HOD'S Pen

Dear Readers,

Greetings from Department of Mechanical Engineering!

I am pleased to know that our students are successful in bringing their firstissue of magazine E-YANTRIK for this academic year 2017-18. E-YANRIK, thedepartmental magazine has the prime objective of providing aspiringengineers a wide platform to showcase their technical knowledge and topen down innovative ideas.This magazine is intended to bring out the hidden literary talents in the students and teachers to inculcate strong technical skills among them. As a half yearly magazine of GIFT, it helps the students to interact and share their ideas with the industry leaders and their peers studying in the college.I congratulate and thank all the students and faculty coordinator who havemade untiring efforts to bring out this magazine.

I thank everyone for their valuable contributions to the magazine and hope to receive similar enthusiasm through your precious insight in the fourth coming issues of E-YANTRIK.

Thanks & Regards,

Dr. Nabnit Panigrahi

H. O. D, Mechanical

Gandhi Institute

ForTechnology, Bhubaneswar

Editor's Pen

s,

sfromDepartmentofMechanical&Engineering!

It brings me immense pleasure to bring the second issue ofthe E-YANTRIKto you. E-YANTRIK has only just begun to explore the potential of the new digital media. I look forward to some awesome output from our students in the coming years. And I wait with bated breath for Best of this year' s to have a laugh, turn a thought, and to try and form a mental picture of what we really are like.

Campus magazine is important not just for capturing the currents and moods of the time, but also because they are an archive we can visit later to view ourselves from the distance t hatthe years will bring. I am glad E-YANTRIK is putting together literary pieces and reviews of the major contributions of GIFT.

E-YANTRIKis by the students, of the students and for the students to bring out their creative skills.

I can just thank and congratulate everyone involved in making this effort a grand success by contributing their articles to spread knowledge and to all of those who have put their heart in to this.

Thanks & Regards,

Prof. Ayushman Nayak,

Asst. Prof., Dept. of Mechanical

Editor, E-Yantrik

- **Article**

1. *Production of pyrolytic oil from waste plasticsas an alternative transportation fuel*
2. *Organic firming using vemicomposting: An alternate method for waste to wealth*
3. *World food organization*
4. *Computer aided process planning*
5. *Cryogenic grinding*

- **Mechanical Poem**
- **Technical quiz**
- **Abbriviation**
- **Grate Quotes**

PRODUCTION OF PYROLYTIC OIL FROM WASTE PLASTICSAS AN ALTERNATIVE TRANSPORTATION FUEL

Prof. Amar Kumar Das

Recent Challenges for disposal of plastic wastes and environmental pollution due to aggregation of such wastes, pyrolysis process is carried out as a substituteproductive and presumptive process, rather than combustion, which is primarily marked as destructive one. Pyrolysis can be proved as a suitable method for non-biodegradable wastes recycling, which seems to be very relevant for complex materials, such as plastics. This method could not only effectively actuate waste plastics with less pollution, but also effective in producing oil, whichcan diminish energy crisis. According to our research pyrolysis ofplastic occurs at a temperature around 2500C under atmospheric pressure and ends at a temperature of about 4500C. Environmental concern and availability of petroleum fuels have caused interests in the search for alternate fuels for internal combustion engines. Conversion of waste to energy is one of the recent trends in minimizing not only the waste disposal but also could be used as an alternate fuel for CIEngines. As an alternative, non-biodegradable, and renewable fuel, waste plastic oil is receiving increasing attention. In the present paper waste plastic pyrolysis oil, waste plastic pyrolysis oil and its blend with diesel hasbeen introduced as an alternative fuel. In this research various operating parameters havebeen prepared for better understanding of operating conditions and constrains for waste plastic pyrolysis oil.

This research has provided concise summary of plastic pyrolysis and a discussion of the main affecting parameters to optimize liquid oil yield. Based on the studies on literatures, pyrolysis process was chosen by most researchers because of its potential to convert the most energy from plastic waste to valuable liquid oil, gaseous and char. Therefore, it is the best alternative for plastic waste conversion and economical in terms of operation. The flexibility that it provides in terms of product preference could be achieved by adjusting the parameters accordingly. The pyrolysis could be done in both thermal and catalytic process. However, the catalytic process provided lower operating temperature with greater yield of liquid oil for most plastics with the right catalyst selection. The sustainability of the process is unquestionable since the amount of plastic wastes available in every country is reaching millions of tons. With the pyrolysis method, the waste management becomes more efficient, less capacity of landfill needed, less pollution and cost effective. Moreover, with the existence of pyrolysis method to decompose plastic into valuable energy fuel, the dependence on fossil fuel as the non-renewable energy can be reduced and this solves the rise in energy demand.

ORGANIC FIRMING USING VEMICOMPOSTING: AN ALTERNATE METHOD FOR WASTE TO WEALTH

Mr. Subhakantasahoo, 4th sem , mechanical

Vermicomposting is a green technology that converts organic wastes into plant available nutrient rich organic fertilizer. It has also found to reduce heavy metal concentration in contaminated feeding materials. Vermicompost (VC), when used as fertilizer, not only bears positive impact on soil quality, plant growth and yield but also enhances nutritional value of crops produced. Use of VC on soil improves its physiochemical (aggregation, stability, pH, EC, bulk density, water holding capacity (WHC), organic matter (OM), micro-and macro-nutrients.) and biological properties (microbial population, enzymes). It also increases soil structural stability and reduces vulnerability of soil to calamities like erosion. Use of VC in plant growth enhances their development in early as well as latter stages of plant growth but proper concentration of VC must be considered for optimum plant growth and production

Vermicomposting is a type of composting in which certain species of earthworms are used to enhance the process of organic waste conversion and produce a better end-product. Vermicomposting is a mesophilic process utilizing microorganisms and earthworms. Earthworms feeds the organic waste materials and passes it through their digestive system and gives out in a granular form (cocoons) which is known as vermicompost.

Like regular compost, vermicompost also benefits the environment by reducing the need for chemical fertilizers and decreasing the amount of waste going to landfills/dumpsites. Vermicompost is primarily earthworm excrement, called castings, which can improve biological, chemical, and physical properties of the soil. The chemical secretions in the earthworm's digestive tract help break down soil and organic matter, so the castings contain more nutrients that are immediately available to plants.

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WORLD FOOD ORGANIZATION

Mr. Rakesh Kumar Swain, 3rd year Mechanical

Food is something we all need-no matter our race, beliefs, skin colour, religion or citizenship in order to survive. So why is it that food is one of the most common wasted items around the world? Especially when it's not the consumers who are wasting the most, but the commercial industry, when all the food being thrown into dumpsters we can push to force the big companies to have the food be given to someone in need.

According to a report of the World Food Organization, every seventh person is hungry in the world. As for india, it ranks 100 in the Global Hunger index among 119 countries. Unfortunately, deaths from hunger take place in the country where many schemes of food and nutrition security are regularly run on a grant of billions of rupees. Under the mid-day meal schemes, about 12 million children are claimed to be fed meals every day. Crores of government funds are spent in the name of providing food and employment to every person.Still, as per the United Nations data, about 10 lakh children die before lakhs of families survive on begging. The average monthly income of 39.39 persent of the household living in the village is less than Rs.10,000, and around 51.14 percent of households survive on temporary wages as they have no regular source of income.

On the one hand, billions of people go hungry and malnourished, on the other, tons is wasted every day. Even as 194 million sleeps on empty stomach every day in our country, India wasted about Rs. 88,800 crore worth of food per tear; it amounts to Rs. 224 crore worth of food a day. About 21 million tonnes of grain is wasted only because we do not have adequate storage facilities to keep it. A major chunk of the total fruit and vegetable produced in the country does not get to the Mandi on time due to lack of proper means of transportation.

According to a report by the Indian Institute of Public Administration, in India every yea 23 million tonnes of pulses, 12 million tonnes of fruits and 21 million tonnes of vegetables get spoiled due to flaws in the distribution system.

Right from the beginning we started noticing the terms "food loss" and "food waste". What exactly do they mean and why is it so important to understand why they're important. we found an article from the Food and Agriculture Organization of the United Nations that lays it out pretty straight forward. "Food loss and food

waste refer to the decrease of food in subsequent stages of the food supply chain intended for human consumption. Food is lost or wasted throughout the supply chain, from the initial production down to the final household consumption.The decrease may be accidental or intentional, but ultimately leads to less food available for all… This may be due to problems in harvesting, storage, packing, transport, infrastructure or market/price mechanisms, as well as institutional and legal frameworks.

We as the overall more wealthy people tend to take for granted what all we have and how lucky we are. We are often very greedy. We-the people in the Northern Hemisphere- are the ones most responsible for the food waste in the world! Approximately one third of food produced for human consumption around the world gets lost or wasted. That's roughly 1.3 billion tonnes of food and amounts to roughly six hundred and eighty billion US dollars in more developed countries and three hundred and ten billion dollars in developing countries. Each year consumers in more developed countries waste almost as much food as the entire net food production of sub-Saharan Africa. Fruits, vegetables, roots and tubers have the highest rates of waste among any other food and make up approximately forty to fifty percent of the global food losses and wastes each year.

At retail levels or commercial levels, large quantities of food are wasted due to quality standards that over emphasis appearance. The companies don't put food out that is less than perfect because they feel it will lose money as people won't buy as much. The problem is although it doesn't appear as perfect as the next item it could still be edible and some people would still be willing to buy it. There are multiple options for the imperfect produce such as a lower price for those ones in a separate section, donating to a homeless person, homeless shelter, give it to the local food bank as they may know someone who might appreciate it and if none of those work, depending on the type of produce it is you can give them to your local S.P.C.A. or animal shelter as they may be able to make use for it. Anything is better than just tossing it in a dumpster for it to sit and rot and get thrown into a landfill. In industrial countries, more than forty percent of food waste and food loss occur at the retail and consumer levels with forty percent at post-harvest and processing in developing countries due to poor or lack of proper equipment.

Food loss and waste also have a negative pull on other resources such as water, land, energy, labour and greenhouse gas emissions that can contribute to global warming as all these are needed to produce the crops and produce yet they're becoming wasted instead of being consumed.

COMPUTER-AIDED PROCESS PLANNING

Mr. Avikarsh Kumar ,3rd year Mechanical

CAPP is a linkage between the CAD and CAM module. It provides for the planning of the process to be used in producing a designed part. Process planning is concerned with determining the sequence of individual manufacturing operations needed to produce a given part or product. The resulting operation sequence is documented on a form typically referred to as a route sheet containing a listing of the production operations and associated machine tools for a work part or assembly. Process planning in manufacturing also refers to the planning of use of blanks, spare parts, packaging material, user instructions .

Process planning encompasses the activities and functions to prepare a detailed set of plans and instructions to produce a part. The planning begins with engineering drawings, specifications, parts or material lists and a forecast of demand. The results of the planning areRoutings which specify operations, operation sequences, work centers, standards, tooling and fixtures. This routing becomes a major input to the manufacturing resource planning system to define operations for production activity control purposes and define required resources for capacity requirements planning purposes.Process plans which typically provide more detailed, step-by-step work instructions including dimensions related to individual operations, machining parameters, set-up instructions, and quality assurance checkpoints.

Manual process planning is based on a manufacturing engineer's experience and knowledge of production facilities, equipment, their capabilities, processes, and tooling. Process planning is very time-consuming and the results vary based on the person doing the planning". The need for CAPP is greater with an increased number of different types of parts being manufactured, and with a more complex manufacturing process.Computer-aided process planning initially evolved as a means to electronically store a process plan once it was created, retrieve it, modify it for a new part and print the plan. Other capabilities were table-driven cost and standard estimating systems, for sales representatives to create customer quotations and estimate delivery time.

CRYOGENIC GRINDING

Mr. SagarSenapati ,3rd year Mechanical

Cryogenic grinding, also known as freezer milling, freezer grinding, and cryomilling, is the act of cooling or chilling a material and then reducing it into a small particle size. For example, thermoplastics are difficult to grind to small particle sizes at ambient temperatures because they soften, adhere in lumpy masses and clog screens. When chilled by dry ice, liquid carbon dioxide or liquid nitrogen, the thermoplastics can be finely ground to powders suitable for electrostatic spraying and other powder processes. Cryogenic grinding of plant and animal tissue is a technique used by microbiologists. Samples that require extraction of nucleic acids must be kept at −80 °C or lower during the entire extraction process. For samples that are soft or flexible at room temperature, cryogenic grinding may be the only viable technique for processing samples. A number of recent studies report on the processing and behavior of nanostructure materials via cry milling.

Freezer milling is a type of cryogenic milling that uses a solenoid to mill samples. The solenoid moves the grinding media back and forth inside the vial, grinding the sample down to analytical fineness. This type of milling is especially useful in milling temperature sensitive samples, as samples are milled at liquid nitrogen temperatures. The idea behind using a solenoid is that the only "moving part" in the system is the grinding media inside the vial. The reason for this is that at liquid nitrogen temperatures (–196°C) any moving part will come under huge stress leading to potentially poor reliability. Cryogenic milling using a solenoid has been used for over 50 years and has been proved to be a very reliable method of processing temperature sensitive samples in the laboratory.

Cryomilling is a variation of mechanical milling, in which metallic powders or other samples (e.g. temperature sensitive samples and samples with volatile components) are milled in a cryogen (usually liquid nitrogen or liquid argon) slurry or at a cryogenics temperature under processing parameters, so a nanostructured microstructure is attained. Cry milling takes advantage of both the cryogenic temperatures and conventional mechanical milling. The extremely low milling temperature suppresses recovery and recrystallization and leads to finer grain structures and more rapid grain refinement. The embrittlement of the sample makes even elastic and soft samples grind able. Tolerances less than 5 µm can be achieved. The ground material can be analyzed by a laboratory analyzer.

MECHANICAL POEM

Mr. Suraj Kumar Gouda, 4th year ,mechanical

THE LITTLE MECHANICAL MAN

The little mechanical man
has finally run down
he sits slumped in the chair
head hanging feet splayed
broken and dented
the little mechanical man is no more
for so many years he just keep leaping up and going
but no more
for so long he retained the bounce back
from every pointless throw at the wall punch
every dark road with no end
every lie that some hand at the end of the road
to grasp
but toys break eventually if you don't take good care
didn't momma tell you that
now look
poor little mechanical man
is broken
wont wind up and run anymore
icant get up and run anymore
so you can quit playing with me god
and put me with the rest of
the broken toys
waiting to go to the trash

TechnicalQuiz

Mr. Mukul Mohanty, 4th Year Mechanical

1. The total energy of a liquid particle in motion is equal to

a. pressure energy+(kinetic energy + potential energy)

b. pressure energy - (kinetic energy + potential energy)

c. pressure energy - (kinetic energy + potential energy)

d. potential energy - (pressure energy + kinetic energy)

2. The power transmitted through the nozzle is maximum when the head lost due to friction in the pipe is _____ of the total supply head.

a. one-half
b. one-third
c. two-half
d. two-third

3.A draft tube is not required for a

a. Francis turbine
b. Kaplan turbine
c. Pelton wheel turbine
d. None of the above

4.NavierStoke's equation represents the conservation of

a. Energy
b. Mass
c. Pressure
d. Momentum

5. Which one of the following is not correct regarding both Kaplan and propeller turbine?
a. The runner is axial
b. The blades are wing type
c. There are four to eight blades
d. The blades can be adjusted

6. The function of the draft tube in a reaction turbine is:
a. To enable the shaft of the turbine to be vertical
b. To transform a large part of pressure energy at turbine outlet into kinetic energy
c.To avoid whirl losses at the exit of the turbine
d. To transform a large part of kinetic energy at the turbine outlet into pressure energy.

7. Pitot tube is generally used to determine:
   a. Flow rate
   b. Velocity of flow
   c. Both
   d. None of the above
8. Impulse turbine requires
   a. High head and low discharge
   b. High head and high discharge
   c. Low head and low discharge
   d. Low head and high discharge
9. Kaplan turbine is _____
   a. Tangential flow
   b. Radial flow
   c. Axial flow
   d. Mixed flow
10. Streamline and equipotential lines in a flow field
   a. are parallel to each other
   b. are identical to each other
   c. are perpendicular to each other
   d. intersect at acute angles

Answers

1. B
2. B
3. C
4. C
5. B
6. B
7. C
8. B
9. D
10. B

ABBRIVIATION

CHS - Circular Hollow Section

CLG - Control Joint

FTP - Fibre Termination Panel (fibre optical cable)

FW - Fillet Weld

HR - Hot Rolled

HV - Vickers Hardness

LGX - Line Group Cross (Connector, fibre optical cable)

LPG - Liquid Petroleum Gas

MS - Mild Steel

PL - Plate

HP - High Pressure

IO - Inspection Opening

KJ - Key Joint

L - Steel Angle

MDF - Main Distribution Frame (Telecommunications)

MFR – Manufacturer

MJ - Movement Joint

GREAT QUOTES

Mr. Gaganmunda 2nd year mechanical

"I destroy my enemies when I make them my friends."

— Abraham Lincoln

"If you want to live a happy life, tie it to a goal, not to people or objects."

— Albert Einstein

Instead of wondering when your next vacation is, maybe you should set up a life you don't need to escape from."

— Seth Godin

You must be the change you wish to see in the world."

— Mahatma Gandhi