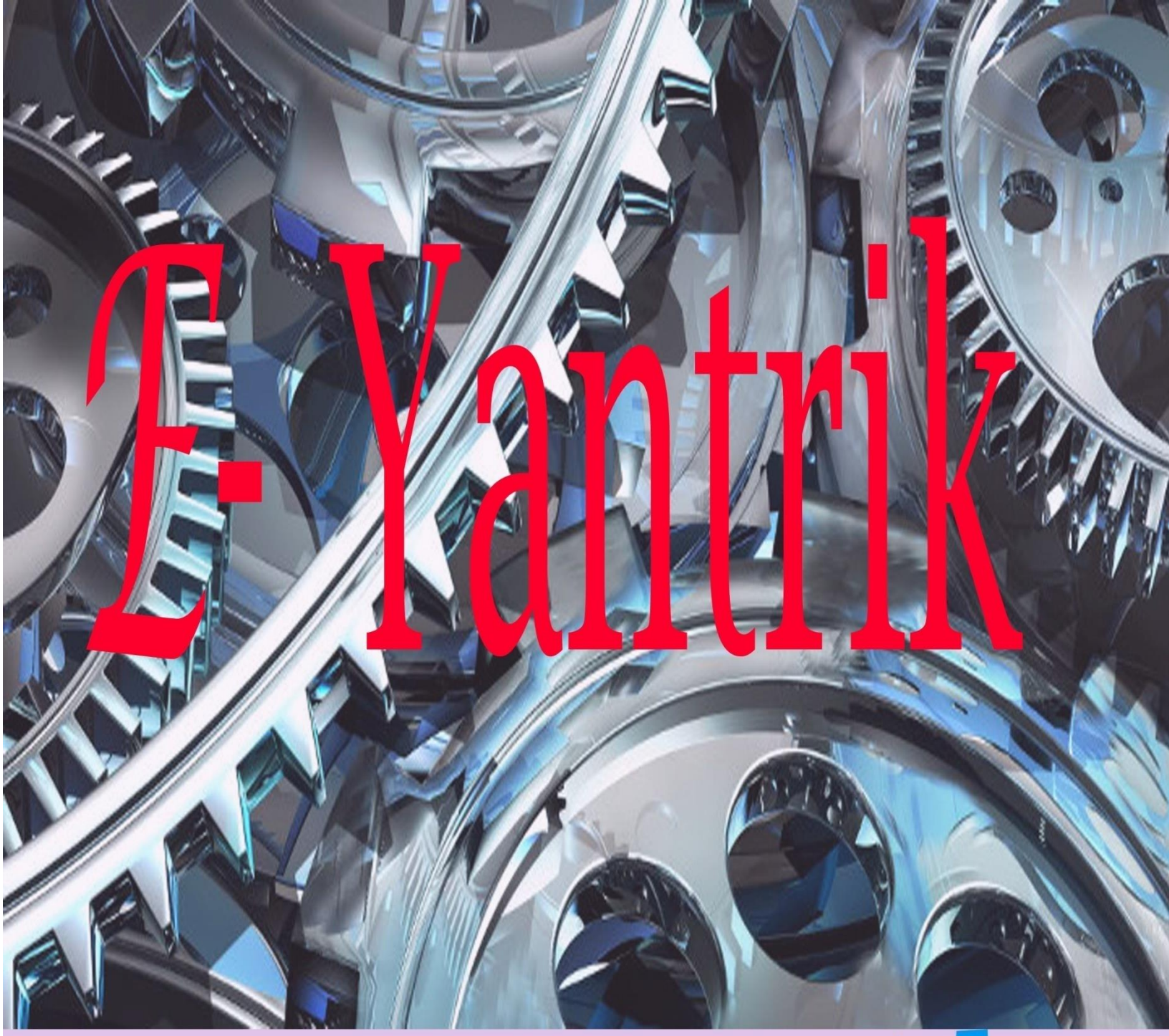

E-Yantrik

Volume: 8

2nd :Issue

GIFT

Student Editors: *Aswini Kumar*

Rakesh kumar Swain

Faculty Editor: *Dr. Alok Mohapatra*

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 latest technology 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 first issue of magazine E-YANTRIK for this academic year 2017-18. E-YANRIK, the departmental magazine has the prime objective of providing aspiring engineers a wide platform to showcase their technical knowledge and to pen 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 have made 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 For

Technology, Bhubaneswar

From the Editor's Pen

Dear Readers,

Greetings from Department of Mechanical & Engineering!

It brings me immense pleasure to bring the second issue of the E-YANTRIK to 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 hat the years will bring. I am glad E-YANTRIK is putting together literary pieces and reviews of the major contributions of GIFT.

E-YANTRIK is 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,

Dr. Alok Mohaptra,

Dept. of Mechanical

Editor, E-Yantrik

- **Article**

1. *Noise Reduction Jet*
2. *Water lifting Device*
3. *Bio disel Fuel in disel engine emission*
4. *Composite in car*

- **Some Intresting Facts**
- **Technical quiz**
- **Mechanical Poem**
- **Grate Quotes**

NOISE REDUCTION JET

Prof. Ayushman Nayak

Jet engine noise suppression has become one of the most important fields of research due to airport regulations and aircraft noise certification requirements. Further reductions in aircraft noise will be harder to achieve, and the problem becomes more difficult with anticipated increases in noise due to increased aircraft operations. It has been the implementation of innovative technology solutions related to engine and shape design that have resulted in the noise reductions. When an aircraft gets to fly it produces friction and turbulence that causes sound waves. In general, as the faster flight of the aircraft becomes more turbulent and friction will occurs. As long as the flaps and landing gear of aircraft are used, more noise is created because more drag is being generated. The quantity of noise which is generated can be different according to the way the plane is flying.

The elimination of aircraft noises is the long-term goals of the industry, universities and government agencies. The noise generated by the airframe is a factor of several parameters affecting the noise level of aircraft; the main source of noise is in the engine. In general way noise reduction techniques can be arranged into passive and active methods. Passive control involves reducing the radiated noise by energy absorption, while the active method involves reducing the source strength or manipulating the acoustic field in the duct to get noise reduction.

There are significant sources of noise in the fan or compressor, turbine and jet or exhaust jets. The noise generation of these components increases with the relative velocity of the airflow. The exhaust jet noise has the significant part of the noise in comparison with compressor or turbine, so reducing it has a profound effect than a similar reduction in above mentioned. Jet exhaust noise is generated when a mixture of produced gases with a turbulent cases are being released that also being affected by the shearing action due to the relative velocity between the exhaust jet and the atmosphere.

The turbulence which is generated near the exhaust exit is the reason of high frequency noise (small eddies) and more at the lower exhaust, turbulence makes low frequency noise (large eddies) also, a shock wave is created as the exhaust velocity exceed the velocity of sound. Reducing noise could be achieved when the rate of mixing getting faster or the relative velocity exhaust to the atmosphere decreases. The noise of the compressor and the turbine is due to the interaction of pressure and turbulence fields for rotary blades and fixed vanes. In the jet engine, the exhaust jet noise is of a high level that the turbine and compressor noise is negligible in most

operating conditions. However, low landing gears reduce exhaust jet noise and low pressure compressor and turbine noise will be increased for the cause of internal power.

Another source of noise is the combustion chamber which is located inside the engine. However, due to being buried in the engine core, it does not have dominated influence. Progress in noise reduction technology such as smooth acoustically inlet and chevrons has made these improved engines available on existing aircraft, and at the same time meeting challenging the requirements for noise. Looking for the future, it is unclear whether the process of increasing productivity will generally continue with decreasing fuel consumption and reducing community noise.

Water Lifting Device without Electricity and Fuel

Rakesh Chandra Biswal ,3rd yr ,Mechanical

A pump is a device that moves fluids (liquids or gases), or sometimes slurries, by mechanical action. Pumps can be classified into three major groups according to the method they use to move the fluid: direct lift, displacement, and gravity pumps. Pumps operate by some mechanism (typically reciprocating or rotary), and consume energy to perform mechanical work by moving the fluid. Pumps operate via many energy sources, including manual operation, electricity, engines, or wind power, come in many sizes, from microscopic for use in medical applications to large industrial pumps.

OBJECTIVES In general hydraulic pump lift water by using electricity, fuel or manpower. There are many technologies are analyzing to lift water without using electricity. As fossil fuel one of the most energy crises in the world. The main aim of the project is to design some of the parameters which determine the flow rate, fabrication and experimental analysis. A. The following factors to be considered 1. Reservoir: Reservoir or storage tank plays a major role. It determines the flow rate. Placing of reservoir determines the supply head. As the gravity of water is used to lift water at elevated height, supply head plays a major role. 2. Drive pipe: The drive pipe is an important component of a hydram installation. The drive pipe must be able to sustain the high pressure caused by the closing of the waste valve. Selection of proper pipe material is also important factor. Some of the factors such as pipe length and pipe diameter is also carefully analyzed and selected as it determines the flow rate. 3. Air chamber: Water hammer is a plumbing noise created when a quick shutoff closes and the water pressure slams into the valve, creating a banging noise. There are a few approaches to eliminating water hammer noise, such as installing air chambers or mechanical water hammer arresters.

4. Delivery head Head delivered to destination with efficient flow rate is important parameter. In this type of flow rate on delivery is determined by the supply head and flow rate of drive pipe. Flow rate at different delivery head comparing with supply head has to be analyzed. Delivery pipe also determines the flow rate thereby delivery head. 5. Maintenance Pump setup is simple in mechanism and has no moving parts which reduce tear and wear. 6. Portable This pump is very small also very less weight. So we can carry this pump very easily from one place to another.

BIODIESEL FUELS ON DIESEL ENGINE EMISSIONS

Mr. Sunil panda,4th yr mechanical

Energy production is heavily dependent on fossil fuels that are not only diminishing, but also are considered the main cause of harmful emissions and global warming. Therefore using vegetable oils such as Jatropha, palm, algae and waste cooking oils as alternative fuels in diesel engines has drawn a great attention. Biodiesel from Jatropha, palm, algae and waste cooking oils has been produced using the transesterification process. Biodiesel from different feedstock is mixed with diesel oil in different proportions e.g. B10 and B20. Biodiesel physical and chemical properties are measured according to ASTM standards. A “single cylinder diesel engine” is employed as the test engine in the present work. Exhaust emissions such as CO, CO_2, NO_x, HC, and smoke are measured and compared with diesel oil. CO, HC, CO_2 and smoke emissions are lower for biodiesel mixtures B10 and B20 (Jatropha, algae and palm) compared “to diesel fuel”. CO_2 emissions from biodiesel blends B10 and B20 produced from waste cooking oil are higher compared to diesel fuel. NO_X emissions from all biodiesel mixtures B10 and B20 increases than diesel fuel for all biodiesel blend B10 and B20.

COMPOSITES IN CARS: MAKING VEHICLES LIGHTER, SAFER AND MORE FUEL-EFFICIENT

Mr. Pradipta Sahoo,3rd year mechanical

Composite materials may someday have big advantages over steel in automobile manufacturing. Composites are being considered to make lighter, safer and more fuel-efficient vehicles. A composite is composed of a high-performance fiber (such as carbon or glass) in a matrix material (epoxy polymer) that when combined provides enhanced properties compared with the individual materials by themselves. Carbon-fiber composites weigh about one-fifth as much as steel, but are as good or better in terms of stiffness and strength. They also do not rust or corrode like steel or aluminum, and they could significantly increase vehicle fuel economy by reducing vehicle weight by as much as 60 percent, according to the Oak Ridge National Laboratory (ORNL). “With composite materials, we get high strength-to-weight and stiffness-to-weight ratios, as well as excellent energy-absorbing capability per mass,” says Dan Adams, professor of mechanical engineering at the University of Utah who is collaborating with ORNL on the development of test methods for automotive composites. “Steel is strong and inexpensive, which is why it’s the material of choice today. But composites can be designed tobe strong and light to provide better safety and fuel efficiency.” Adams says that the strength and stiffness factors are why composites are currently used in aerospace applications, which also require a material that is extremely light. And compared to single-layered steel in cars, multiple-layer composite laminates can be designed to absorb more energy in a crash. “However, the use of these materials in the automotive industry has been very limited partly because of the costs associated with the materials and manufacturing,” he says. Adams and his associates are addressing these issues, along with design safety, as they develop test methods and assess candidate composites for automotive applications.

SOME INTRESTING FACTS

Mr. Biswaranjan tarai,4th yr mechanical

- ***The average fuel cost across all vehicles is 14.45 cents per mile, or about 23 miles per gallon.***
- ***The best selling car of all-time is the Toyota Corolla.***
- ***The U.S. consumes about half of the world's gasoline.***
- ***Ferrari manufactures a maximum of 14 cars a day.***
- ***Every year, over $60 billion worth of car maintenance goes unperformed.***
- ***The average consumer spends $400 a year on diagnostics, scheduled maintenance, and tune-ups.***
- ***Traffic congestion wastes three billion gallons of gas each year.***
- ***The first windshield wipers were hand-operated.***
- ***The most commo.***
- ***White is the most popular car color.***
- ***The total average repair cost in the U.S. is $305.55, including $202.28 for parts and $103.27 for labor.***

TECHNICAL QUIZ

Mr. BISWARANJAN TARAI, 4th Year MECHANICAL

1. Segmental chips are formed during machining
   - **A.** mild steel
   - **B.** cast iron
   - **C.** high speed steel
   - **D.** high carbon steel
2. Cemented carbide tool tips are produced by powder metallurgy.
   - **A.** True
   - **B.** False
3. If the diameter of the hole is subject to considerable variation, then for locating in jigs and fixtures, the pressure type of locator used is
   - **A.** conical locator
   - **B.** cylindrical locator
   - **C.** diamond pin locator
   - **D.** vee locator
4. Side rake angle of a single point cutting tool is the angle
   - **A.** by which the face of the tool is inclined towards back
   - **B.** by which the face of the tool is inclined sideways
   - **C.** between the surface of the flank immediately below the point and a plane at right angles to the centre line of the point of the tool
   - **D.** between the surface of the flank immediately below the point and a line drawn from the point perpendicular to the base
5. Internal gears can be made by
   - **A.** hobbing
   - **B.** shaping with pinion cutter
   - **C.** shaping with rack cutter
   - **D.** Milling

6. In order to prevent tool from rubbing the work _____ on tools are provided.
   - **A.** rake angles
   - **B.** relief angles
7. The silicon carbide abrasive is chiefly used for grinding
   - **A.** cemented carbide
   - **B.** ceramic
   - **C.** cast iron
   - **D.** all of these
8. Drilling is an example of
   - **A.** orthogonal cutting
   - **B.** oblique cutting
   - **C.** simple cutting
   - **D.** uniform cutting
9. A round nose tool may be fed eitner from left to right end or from right to left end of the lathe bed.
   - **A.** Yes
   - **B.** No
10. When the cutting edge of the tool is dull, then during machining
    - **A.** continuous chips are formed
    - **B.** discontinuous chips are formed
    - **C.** continuous chips with built-up edge are formed
    - **D.** no chips are formed

Answers

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

MECHANICAL POEM

Mr. Chita ranjan Kuamr , 4th Year mechanical

Memorable lines:

Our deepest fear is not that we are inadequate.

Our deepest fear is that we are powerful beyond measured

It is our light, not our darkness

That most frightens us.

We ask ourselves

Who am I to be brilliant, gorgeous, talented, fabulous?

Actually, who are you not to be?

You are a child of God.

GREAT QUOTES

Chandan Kumar Bhadra, 4th Year mechanical

1. *"Never tell people how to do things. Tell them what to do and they will surprise you with their ingenuity." – General George Patton*

2. *"Leadership is the art of getting someone else to do something you want done because he wants to do it." – General Dwight Eisenhower*

3. *"To do great things is difficult; but to command great things is more difficult." – Friedrich Nietzsche*

4. *"Earn your leadership every day." – Michael Jordan*

5. *"A good leader is a person who takes a little more than his share of the blame and a little less than his share of the credit." – John Maxwell*

6. *"Effective leadership is not about making speeches or being liked; leadership is defined by results not attributes." – Peter Drucker*

7. *"Big jobs usually go to the men who prove their ability to outgrow small ones." – Ralph Waldo Emerson*

8. *"Leadership and learning are indispensable to each other." – John F. Kennedy*