BITT POLYTECHNIC

GETALATU, RANCHI

DEPARTMENT OF MECHANICAL ENGINEERING

4TH SEM.

ASSIGNMENT NO. - 01

SUBJECT: MANUFACTURING TECHNOLOGY

Q1. What is a welding process? Give detailed classification of various welding processes.

Q2. What is a submerged arc welding process? Explain the principle and working with a neat sketch.

Q3. What is the function of flux in coated electrodes? Explain.

Q4. What is ultrasonic welding? Explain principle and working with neat sketch.

Q5. What is a laser beam welding? Explain principle and working with neat sketch.

Q6. What is metal inert gas (MIG) welding? Explain in brief with a diagram.

Q7. What is Tungsten inert gas (TIG) welding? Explain with a diagram.

Q8. What are different types of flames? Explain in detail with diagram.

Q9. What is an explosive welding technique? Explain.

Q10. What is a gas welding process? Explain in brief.

Q11. What are equipments used in welding process.

Q12. What is a Thermit welding? Explain in brief with the reactions involved in the process.

Q13. What is shielded metal arc welding process? Explain in brief.

Q14. What is slag in arc welding process? What is its use?

Q15. What are consumable and non consumable electrodes used in welding? Explain.

SUBJECT: FLUID MECHANICS & MACHINE

Q.1. What are the functions of hydraulic fluids?

Q.2. State the properties of fluid.

Q.3. What is viscosity?

Q.4. What is surface tension?

Q.5. What is capillarity?

Q.6. State difference between ideal fluid and real fluid.

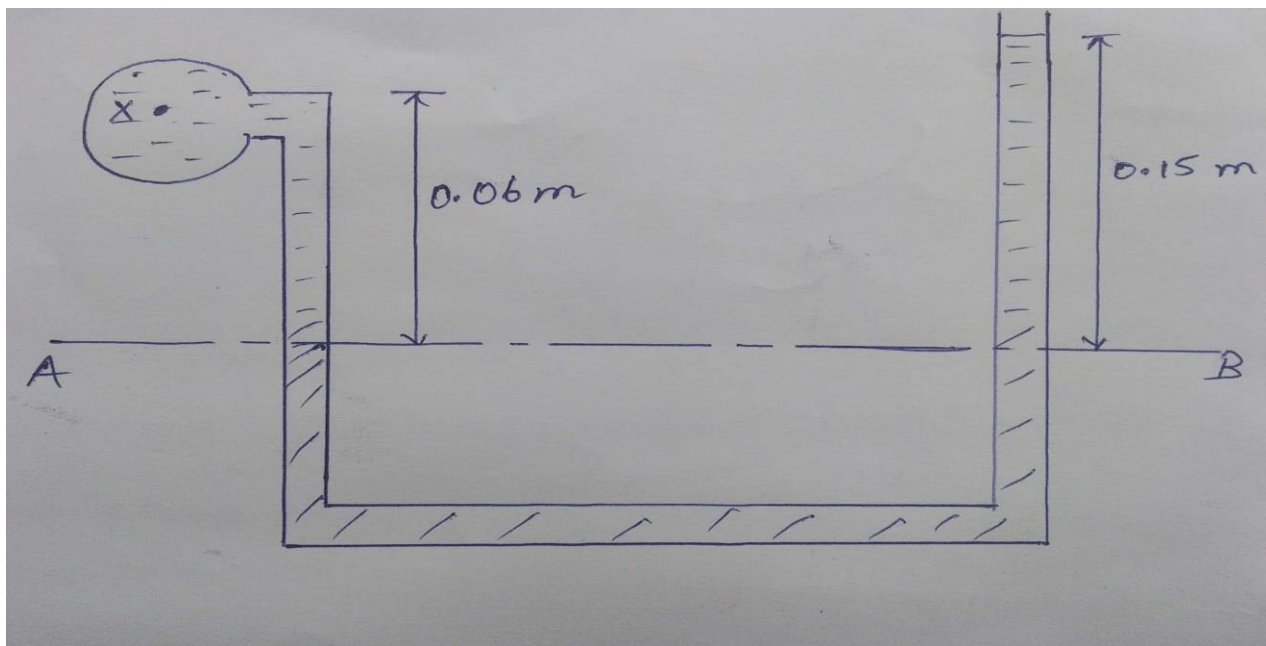**Q.7**. State Pascal's Law.

Q.8. Define atmospheric pressure.

Q.9. Define gauge pressure.

Q.10. Draw neat sketch of inverted U-Tube manometer and state its use.

Q.11. Convert 30 cm of oil column in N/cm2. Take specific gravity of oil as 1.2.

Q.12. Find the pressure of liquid in a pipe of specific gravity 0.8 as shown in figure. The manometer contains mercury.

Q.13. A rectangular plate having 4m depth and 2.5m width is submerged vertically in liquid of specific gravity 1.2 as shown in figure. Find total pressure and depth of centre of pressure from free surface.
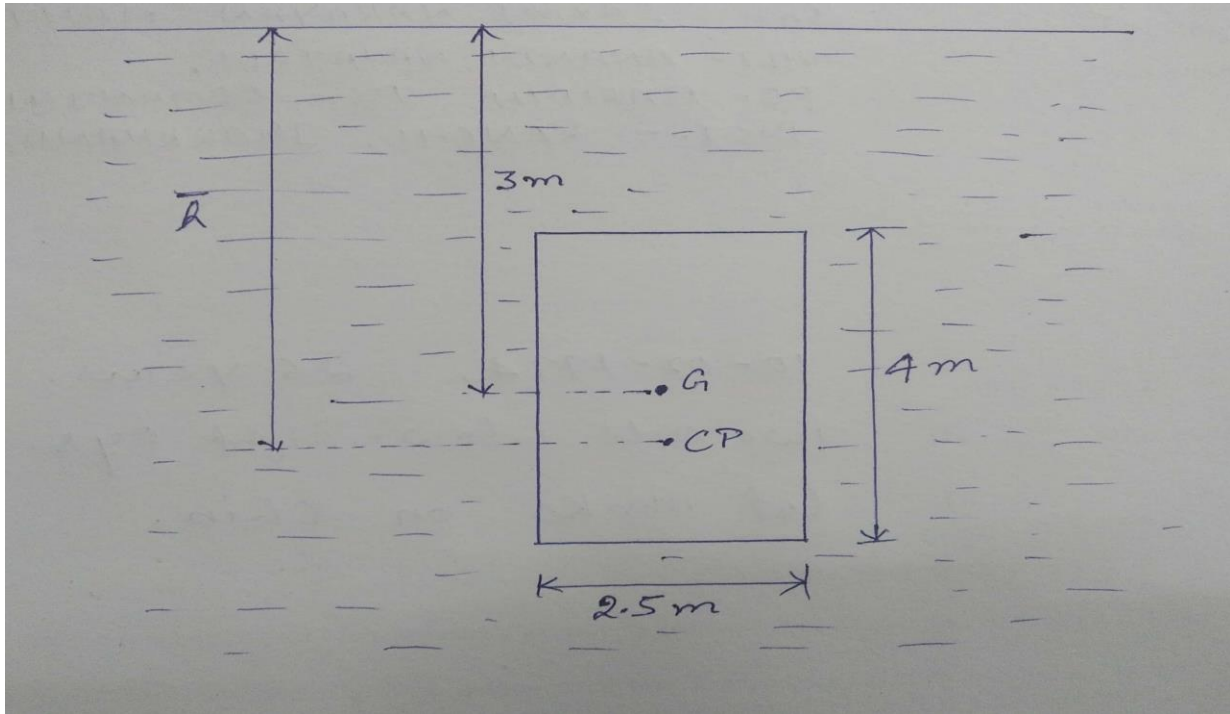
Q.14. What do you mean by kinematic and dynamic viscosity, also provide their formula and unit?

Q.15. What is vapor pressure?

SUBJECT: THERMAL ENGINEERING

Q.1. Explain Energy with suitable example.

Q.2. What are the various sources of energy? Classify as renewable and non-renewable sources.

Q.3. Compare the flat plate collector and concentrating collector with neat & clean diagram.

Q.4. Write short notes on Solar Water heater.

Q.5. Define the following terms:-
      (a) Thermodynamics
      (b) Thermodynamic System
      (c) Surrounding
      (d) Boundary & Types of Boundary

Q.6. Discuss the various types of system with examples.

Q.7. Describe the concept of ideal gas & various laws of gas.

Q.8. What do you mean by properties of the system? Classify as extensive & intensive properties with suitable examples.

Q.9. Write the short notes on the following:-
      (a) Pure substance
      (b) State

Q.10. A gas is contained in a container having volume 4.67 m^3 at temperature 400 °C, Find the volume occupied by the same gas at temperature 15°C. During the process pressure of the gas remain same.

Q.11. Choose the correct option
    (i) The main component of natural gas is
      (a) CO_2 (b) CO   (c) O_2 (d) CH_4

    (ii) Most of fossil fuel has
      (a) Spontaneous combustion   (b) Explosion   (c) Rapid combustion
(d) None of them

(iii) Absolute zero temperature is taken as
   (a) 273∘C   (b) -273∘C   (c) 237∘C   (d) 273 K

(iv) The equation of state of an ideal gas is a relationship between the variables:-
   (a)Pressure & Volume   (b) Pressure & Temperature
   (c) Volume, Pressure & Temperature   (d) None of these

(v) Boyle's Law for a perfect gas may be expressed as
   (a) $\frac{T2}{T1} = \frac{P2}{P1}$ if V is unchanged
   (b) $\frac{T2}{T1} = \frac{V2}{V1}$ if P is unchanged
   (c) $\frac{P2}{P1} = \frac{V2}{V1}$ if T is unchanged
   (d) $\frac{P2}{P1} = \frac{V1}{V2}$ if T is unchanged

(vi) The relationship between Characteristics gas constant & Universal gas constant is
   (a)   R= $\frac{\bar{R}}{M}$ (b) $\bar{R} = \frac{R}{M}$ (c) R= n $\bar{R}$ (d) $\bar{R} = nR$

(vii) Which of the following is an example of intensive property?
   (a)Volume   (b) Density   (c) Energy   (d) None of these

(viii) Which of the following is true for open system?
   (a) Energy transfer but mass con not be   (b) Both Energy & mass transfer
   (c) Only Mass transfer   (d) Only Energy Transfer

Q.12. Write short notes on Solar Distillation.

Q.13. Write short notes on Photovoltaic cell.

Q.14. Write short notes on Cycle.

Q.15. Write short notes on Process.

SUBJECT: THEORY OF MACHINE

Q.1. Differentiate between machine and structure.

Q.2. Write the difference between machine and mechanism.

Q.3. Explain the types of kinematic pair on the basis of relative motion between the elements of the pair with suitable figure.

Q.4. Explain the types of kinematic pair on the basis of mechanical contact with suitable diagram.

Q.5. Explain the types of kinematic pair on the basis of nature of contact between two links with suitable diagram.

Q.6. Write short notes on Geneva mechanism with figure.

Q.7. What is a link?

Q.8. What is a kinematic link? Give suitable figure.

Q.9. What is a kinematic pair?

Q.10. What is a kinematic chain? Give suitable figure.

Q.11. What is a mechanism?

Q.12. What is a inversion?

Q.13. Explain Whit Worth Quick Return Mechanism, also provide the figure.

Q.14. What are the inversion of four bar chain mechanism with example.

Q.15. Give the relationship between linear velocity and angular velocity?

SUBJECT: ELECTRICAL ENGINEERING

Q.1. Write 10 application of electricity.

Q.2. What do you mean by Electric potential & electric current?

Q.3. State & explain ohm's law.

Q.4. State the factor on which resistance of material depends.

Q.5. What do you mean by resistivity? Derive the expression for resistivity.

Q.6. Differentiate between AC & DC.

Q.7. The electric current in a conducting wire is 0.25A both ends are given a potential of 12V. What is the electrical resistance?

Q.8. Explain why Ammeter is connected in series & voltmeter is connected in parallel.

Q.9. . Two coils connected in series have resistance of 18Ω & when connected in parallel have resistance 4Ω. Find the resistance of each coil.
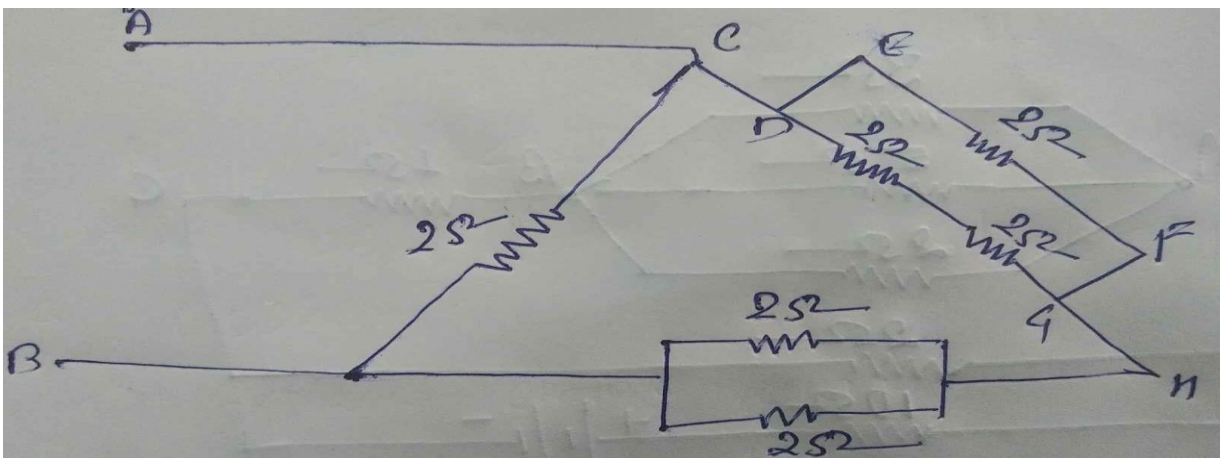
Q.10. What is Inductance? Write down the factor affecting the inductance of coil.

Q.11. What is capacitance? Write down the factor affecting the capacitor.

Q.12. Derive the expression for energy store in inductor & capacitor.

Q.13. Derive the expression for energy store in inductor & capacitor.

Q.14. Find the equivalent resistance between terminals A-B.

Q.15. Calculate the current supplied by the battery in the following circuit. Also find power dissipated by the circuit.