**SUBJECT: BASIC MECHANICAL ENGINEERING [BT- 203]**

**Important Questions**

**Unit III**

1. Calculate the specific weight, density ,specific volume and specific gravity of petrol.if one litre of petrol weights 5N.
2. Write short notes on –
   1. Bernoulli’s Equation
   2. Pascal’s Law and its applications
   3. Laminar and Turbulent flow.
3. Classify various types of turbines according to head and energy available at inlet to the turbine.
4. A pipe 200 metre long has a slope of 1 in100 and tapers from 1 m diameter at high end to

0.3 m at the low end .Quantity of water flowing is 4000 liters per minute. If the pressure at high end is 60 KPa , find the pressure at the low end?

1. Differentiate between centrifugal pump and reciprocating pump.
2. Two horizontal plates are placed 21 mm apart. The space between them is filled with oil of viscosity 6 poise. If the relative velocity between the plates is 1.4 m/s calculate the shear stress in the oil.

1. Explain the construction and working of Reciprocating Pump and centrifugal Pump.
2. Explain with neat diagram hydroelectric plant and its component.
3. Explain the working principle of pelton wheel turbine with neat sketch .
4. State Newton’s law of viscosity and also explain what are different types of fluids?

(unit 4) Thermodynamics

1. Define 1) sensible heat of water 2) latent heat of vaporization 3) superheat 4) Dryness fraction
2. Define the thermodynamic system. Differentiate between open system, closed system and an isolated system. Also explain how thermodynamic properties are classified.
3. Discuss the first law of Thermodynamics. Also explain Kelvin-Planck and Clausius statement of Second law of Thermodynamics.
4. One kg of steam at 8 bar exist at the following conditions

* wet with 0.8 dry
* dry saturated
* temperature is 199°C.

Find the enthalpy in each cases.

1. What is meant by draught ? classify various boiler draught systems.
2. How boilers are classified?
3. Calculate the equivalent evaporation from and at 100 for a boiler, which receives water at 60 and produces steam at 1.5MPa and 300 . The steam generation rate is 16000 kg/hr. coal is burnt at the rate of 1800kg/hr. the calorific value of coal is 34750kJ/kg. Also calculate the thermal efficiency of boiler.
4. Differentiate between mountings and accessories of a boiler.
5. A coal fired boiler plant consumer 400kg of coal per hour. The boiler evaporates 3200kg of water at 44 0 C in to superheated steam at a pressure of 12 bar and 274.50 C. If the calorific value of fuel is 35000 KJ/kg of coal. Determine

* Equivalent evaporation
* Thermal efficiency of boiler

1. Find the enthalpy of steam at 15 bar in the following conditions:

* Dry and saturated
* Wet having dryness fraction of 0.9
* Superheated to a degree of superheat =2550

UNIT 5 (Reciprocating Machines)

1. Explain the working of 4stroke petrol engine with PV and TS Diagram.
2. Explain the working of 4stroke Diesel engine with PV and TS Diagram.
3. Explain the difference between Petrol and Diesel Engine.
4. Explain the difference between 2 stroke and 4 stoke engine.
5. Explain construction and working of steam engine.
6. What is the difference between hypothetical and theoretical indicator diagram of steam engine.
7. Derive the expression of mean effective pressure and power developed by steam engine.
8. Explain following terms in engine :- a) clearance volume b) Back Pressure c) Dead centre d) single acting and double acting e) eccentric f) swept Volume h) types of efficiency in engine.
9. Steam entering into a double acting single cylinder steam engine at a pressure of 14 bar .The cut-off occurs at 20 % of the stroke . If back pressure is 0.15 bar and diagram factor is 0.72, calculate the actual mean effective pressure.
10. An engine is working on ideal otto cycle having a cylinder bore of 200 mm and stroke of 450 mm. If the clearance volume is 2 x106 mm3 ,find the compression ratio and the air standard efficiency of the engine.