BE - 203

B.E. I & II Semester

Examination, December 2014

Basic Mechanical Engineering

Time : Three Hours

Maximum Marks : 70

Note : i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each questions are to be attempted at one place.

iii)A11 questions cany equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Define tensile strength of a material.

b) State the composition of grey cast Iron and it's applications.

c) What is modules ofElasticity? Give it's unit ofmeasurement.

d) Explain the Iron-Carbon diagram.

OR

Define Hardness and explain the Brinell hardness test.

2. a) Define temperature and name one device and it's operating principle for measuring temperature.

b) What is orifice meter. Draw it's diagram and give the formula used for measurement.

c) Explain the operating procedure of vernier caliper.

d) Write a short note on

i) Combination set ii) Sine bar

OR

Explain the quick return mechanism used in shaper with neat sketch.

3. a) Differentiate between real fluid and ideal num.

b) Define kinematic viscosity of fluid. What is it's unit of measurement?

c) What is hydrostatic law? Explain it.

d) What is venturimeter? Derive the expression for measuring rate of flow of fluid in a horizontal pipe.

OR

What is a Hydraulic turbine? Draw a neat sketch of Pelton turbine and explain it's working.

4. a) What is internal energy?

b) Name boiler mountings and explain one of them.

c) At 1.2 MPa, 250°C steam enters into a turbine and expands to 30°C. Determine the work output of turbine for 10 kg/s of flow rate.

d) Explain the operating principle of a vapour compression refrigeration cycle.

OR

In a boiler trial the following observation are made

Feed water temperature = 40°C

Boiler pressure = 15 bar

Dryness Fraction of steam = 0.85

Coal consumption = 450 kg/h

Feed water supplied = 3500 kg/hr

C.V. of coal = 40,000 kJ/kg

Calculate the evaporation factor and equivalent evaporation at 100°C in kg/kg of coal.

5. a) Draw the hypothetical indicator diagram of a steam engine.

b) Draw the p-v diagram of carnot cycle and express it's efficiency.

c) Explain the fundamental difference between otto and diesel cycle.

d) :Explain the working of a 4 stroke diesel engine.

OR

Differentiate between two stroke and four stroke I.C. engine.