

Roll No .....

**BE - 203**

**B.E. I & II Semester**

Examination, June 2015

**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) All questions carry 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.

**Unit - I**

1. a) Define stress and strain.
- b) State the effects of adding the alloying elements such as Manganese and Tungsten to steels.
- c) State and explain Hook's law and modulus of elasticity.
- d) Draw and explain stress-strain diagram for an elastic materials.

OR

Write down composition of Carbon Steel and enlist mechanical properties.

**Unit - II**

2. a) Write down the principle of temperature measurement.
- b) Explain the term Threshold value of any measuring instrument.
- c) What are the various source of measuring errors?
- d) Give the labelled diagram, method of use and application of sine bar.

OR

Explain various lathe operation in brief.

**Unit - III**

3. a) State Newton's law of viscosity.
- b) What are the applications of Bernoulli's theorem?
- c) How fluids are classified?
- d) Derive Bernoulli's equation for a perfect incompressible liquid.

OR

Explain construction and working of fluid coupling.

**Unit - IV**

4. a) Write down two statements of second law of thermodynamics.
- b) What is equivalent evaporation?
- c) Find the enthalpy of steam at 9 bar when it is dry saturated.
- d) Explain with neat sketches, the working of vapour compression system. Also draw P-V and T-S diagrams.

OR

5000 kg of steam is produced per hour at a pressure of 7 bar in a boiler. The temperature of feed water 40°C. The dryness fraction of steam at exit is 0.98. The mass burnt per hour is 700 kg and calorific value of coal is 31000 kJ/kg.

Determine the equivalent evaporation and boiler efficiency.

**Unit - V**

5. a) Give list of parts of double acting steam engine.
- b) What is the function of connecting rod in Heat engines?
- c) Why cooling of an IC engine is required?
- d) Explain with the help of P-V diagram the working of four stroke petrol engine.

OR

Explain Carnot cycle and find expression for ideal efficiency of Carnot engine.

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