Total No. of Questions : 10] [Total No. of Printed Pages : 3

Roll No. .....

BE–203(GS)

B. E. (First/Second Semester) EXAMINATION, June, 2012

(Grading System)

(Common for all Branches)

BASIC MECHANICAL ENGINEERING

[BE – 203(GS)]

Time : Three Hours

Maximum Marks : 70

Minimum Pass Marks : 22 (D Grade)

Note : Attempt *five* questions in all selecting *one* question from each Unit. All questions carry equal marks.

Unit – I

1. (a) Define the following mechanical properties of engineering material :
   (i) Ductility
   (ii) Hardness
   (iii) Toughness
   (iv) Machinability

   (b) Discuss the stress-strain curve for a ductile material.

Or

2. (a) What is Alloy Steel ? Name *two* types of alloy steel giving their composition and uses.

P. T. O.

(b) Define hardness and explain the testing procedure for determining hardness of engineering material.

Unit – II

3. Explain the construction and uses of the following measuring instruments :
   (i) Dial gauge
   (ii) Micrometer

Or

4. (a) Describe the measurement of flow rate of a fluid flowing through a circular pipe.
   (b) Name and explain *five* operations which can be performed on a lathe machine.

Unit – III

5. (a) State Newton's law of viscosity. What is the effect of temperature on viscosity of water and gas ?
   (b) What is fluid coupling ? Explain its working principle.

Or

6. (a) Differentiate between absolute pressure and gauge pressure. How can we measure pressure exerted by fluid ?
   (b) Differentiate between the following :
      (i) Laminar and turbulent flow
      (ii) Turbine and compressor

Unit – IV

7. (a) State and explain First Law of Thermodynamics.
   (b) Explain the working of a simple vapour compression refrigeration cycle.

Or

8. (a) Define the following terms :
   (i) Sensible heat of water
   (ii) Latent heat of steam
   (iii) Dryness fraction of steam
   (iv) Saturation temperature of steam

   (b) Explain the working of a water tube boiler with the help of a neat sketch.

Unit – V

9. (a) Explain the working of a double acting steam engine with the help of a neat diagram.

   (b) Differentiate between petrol and diesel engine.

Or

10. (a) A reversible heat engine delivers 0·6 kW power and rejects heat energy to a reservoir at 300 K at the rate of 24 kJ/min. Determine the cycle efficiency and temperature of the thermal reservoir supplying heat to the engine.

    (b) Explain the working of a 4-stroke petrol engine.