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

Roll No. .....

BE–203(GS)

B. E. (First/Second Semester) EXAMINATION, Dec., 2011

(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. Use of Steam table is permitted. Assume suitable missing data, if any.

Unit–I

1. (a) Define the following mechanical properties of engineering material : 6

   (i) Ductility

   (ii) Brittleness

   (iii) Toughness

   (b) Discuss the iron-carbon diagram and various allotropies of steel. 8

P. T. O.

Or

2. (a) What is cast iron ? What are different types of cast iron ? Discuss their properties. 8

   (b) Define hardness. Explain any hardness testing method in brief. 6

Unit – II

3. (a) Explain the term measurement and measurement error. 6

   (b) What is a sine bar ? Explain its use with the help of neat diagram and explain. 8

Or

4. Explain the working of a vertical drilling machine with the help of a neat sketch. Also state the parameters used to specify a drilling machine. 14

Unit – III

5. Write a short note on hydraulic Turbine and fluid coupling explaining their working with the help of neat sketches. 14

Or

6. (a) Differentiate between Laminar and Turbulent flow. 6

   (b) State Newton's law of viscosity. The velocity distribution of flow over a flat plate is given by $u = \frac{1}{3}y^2 - \frac{1}{4}y$, where u is the velocity of water in m/sec. at a distance y m above the plate. Determine the shear stress at a distance 1·8 m above the plate. 8

Unit – IV

7. (a) Differentiate between the following : 9

   (i) Boiler mounting and Accessory

   (ii) Natural Draught and Forced Draught

   (iii) Vapour compression and vapour absorption refrigeration system

(b) What is eco-friendly refrigerant ? Name any refrigerant and its properties. 5

Or

8. (a) What is Second Law of Thermodynamics ? Explain the *two* statements of this law. 8

(b) Define boiler efficiency and C. O. P. of a refrigeration system. 6

Unit – V

9. (a) What is a steam engine ? Give its classification. 6

(b) Dry saturated steam at 10 bar is admitted into the cylinder of a double acting, single cylinder steam engine. The cylinder diameter is 275 mm and stroke 650 mm. Cut-off occurs at 50% of the stroke length and pressure is 1·5 bar. Assuming a diagram factor of 0·75, find the indicated power of the engine, if it runs at 380 r. p. m. 8

Or

10. (a) Differentiate between two-stroke and four-stroke I. C. engine. 6

(b) Explain the working of four-stroke petrol engine. 8