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BE–204

B. E. (First/Second Semester) EXAMINATION, June, 2010

(Common for all Branches)

BASIC MECHANICAL ENGINEERING

(BE – 204)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt any *five* questions. Internal choices are given. Steam table is permitted.

1. (a) What are the effects of the following elements of steel ? 10

   (i) Chromium
   (ii) Manganese
   (iii) Molybdenum
   (iv) Cobalt
   (v) Sulphur

   (b) Define the following properties of engg. material : 10

   (i) Proportionality limit
   (ii) Resilience
   (iii) Creep
   (iv) Brittleness
   (v) Wear

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Or

2. (a) Give the composition properties and uses of wrought iron. 10

   (b) Draw the stress-strain curve for mild steel. Also discuss the various properties of mild steel related to this curve. 10

3. (a) Explain the various drilling operations done by drilling machine. 10

   (b) Find out the taper angle of workpiece if consecutive height of the two ends of a sine bar from the surface plate is given as 10 cm and 5 cm. The length of sine bar is 10 cm. 10

Or

4. (a) Explain milling machines. 10

   (b) Explain the various pressure measurement instruments. 10

5. (a) Describe with sketch construction and working of Kaplan turbine. 10

   (b) If 5 m^3 of a certain oil weighs 40 kN, calculate the specific weight, mass density and relative density of the oil. 10

Or

6. (a) Explain the function of the following components of hydroelectric power plant : 10

   (i) Forebay

   (ii) Draft tube

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(b) Distinguish between the following : 10

(i) Impulse and reaction turbine

(ii) Peak load plant and base load plant

7. (a) Classify with neat sketch, the various types of draught. 10

(b) A pressure cooker has 3 kg of steam at 5 bar pressure at 0·9 dry. What quality of heat be rejected so as the quality of steam becomes 60% dry ? 10

Or

8. (a) Write short notes on the following : 2 each

(i) Latent heat

(ii) Dryness fraction

(iii) Boiler efficiency

(iv) Equivalent evaporation

(v) Super heat

(b) Find the change in internal energy when one kg of steam expands from 10 bar and 300°C to 5 bar and 0·9 dry. Take $C_{ps} = 2 \cdot 1$ kJ/kg. 10

9. (a) Why does actual indicator diagram differ from theoretical diagram ? Explain them. 10

(b) Discuss the working of Otto engine. 10

Or

10. (a) Explain the Carnot cycle and its ideal efficiency. 10

(b) Differentiate between the following : 5 each

(i) Two stroke and four stroke engine

(ii) SI and CI engine