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First/Second Semester B.E. Degree Examination, June/July 2016 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Explain the working of a hydroelectric power plant with a neat sketch. (10 Marks)
- b. Distinguish between renewable and non-renewable sources of energy with suitable examples. (06 Marks)

OR

- 2 a. With a neat sketch, explain the working of a water tube boiler. Show the path of flue gases. (10 Marks)
- b. Draw a neat sketch of temperature-Enthalpy diagram and indicate the following on it:
Latent heat of evaporation, Amount of super heat, Sensible heat, Degree of superheat, Saturation temperature. (06 Marks)

Module-2

- 3 a. Discuss the advantages of steam turbines over other prime movers. (10 Marks)
- b. Draw a neat sketch of a simple impulse water turbine indicating the parts. Explain its working. (06 Marks)

OR

- 4 a. Explain the working of a four stroke petrol engine with neat sketches. (10 Marks)
- b. A 4-cylinder two stroke engine develops 30 kW at 2500 rpm. Calculate the diameter and stroke of each cylinder if the stroke to bore ratio is 1.5. The mean effective pressure on each piston is 6 bar and its mechanical efficiency is 80%. (06 Marks)

Module-3

- 5 a. Explain the process of taper turning by swiveling of the compound rest with a neat sketch. (10 Marks)
- b. Differentiate between:
 - (i) Drilling and reaming.
 - (ii) Boring and counter boring.
 (06 Marks)

OR

- 6 a. Explain the Cartesian co-ordinate configuration and spherical co-ordinate configuration of robots with neat sketches. (10 Marks)
- b. Mention the advantages and limitations of automation. (06 Marks)

Module-4

- 7 a. Define composite materials. How are composites classified? (10 Marks)
- b. Mention the applications of composite materials in aerospace and automotive industries. (06 Marks)

OR

- 8 a. Explain the principle of arc welding with a neat sketch. (10 Marks)
b. List the different types of oxyacetylene flames and state their applications. (06 Marks)

Module-5

- 9 a. Explain the working principle of a vapour compression refrigeration system with a neat sketch. (10 Marks)
b. List the desirable properties of a refrigerant. (06 Marks)

OR

- 10 a. With a neat sketch, explain the working of a room air conditioner. (10 Marks)
b. Distinguish between refrigeration and air conditioning. (06 Marks)

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