

CBCS SCHEME

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17EME14/24

First/Second Semester B.E. Degree Examination, June/July 2018 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Differentiate between Renewable and Non-Renewable energy resources. (04 Marks)
- b. With a neat sketch explain the principle of operation of a typical wind mill. (08 Marks)
- c. Showing all the components explain the principle of electric power generation from Hydro power plants. (08 Marks)

OR

- 2 a. Explain the following terms with T-H diagram:
(i) Wet steam (ii) Dry saturated steam (iii) Super heated steam (iv) Degree of superheat. (08 Marks)
- b. Name Boiler mountings and accessories. Explain its importance. (04 Marks)
- c. Explain with a neat sketch working principle of Babcock and Wilcox boiler. (08 Marks)

Module-2

- 3 a. With sketch explain working principle of De laval's Turbine. (06 Marks)
- b. Explain the working of closed cycle gas turbine. (06 Marks)
- c. Explain the working principle of Francis and Kaplan turbine. (08 Marks)

OR

- 4 a. How are IC engines classified? With a sketch explain the working principle of 4 stroke CI engine indicating PV-diagram. (12 Marks)
- b. A 4-stroke diesel engine has a piston diameter of 300 mm and stroke of 450 mm. Mean effective pressure is 4 bar, speed is 450 rpm. Diameter of the brake drum is 1 m and effective brake load is 450 N. Determine Indicated power, Brake power and Frictional power. (08 Marks)

Module-3

- 5 a. Explain with sketch following operations on Lathe:
(i) Plane Turning (ii) Knurling (iii) Thread cutting (06 Marks)
- b. Explain with sketch the taper turning by swivelling compound tool rest. (06 Marks)
- c. With sketch explain the following operations :
(i) Counter sinking (ii) Counter boring (iii) End milling (iv) Slot milling (08 Marks)

OR

- 6 a. With a block diagram, explain the basic elements of NC automation system. (06 Marks)
- b. Classify the robot based on physical configuration. Explain the Cartesian coordinate robot with neat sketch. (08 Marks)
- c. Differentiate drilling and milling operation. (06 Marks)

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Module-4

- 7 a. How are composite classified? What are the applications of composites in automobile and aerospace industry? (06 Marks)
 b. Write a note on application of ferrous and non-ferrous alloys. (06 Marks)
 c. Explain with a sketch working of electric arc welding process. (08 Marks)

OR

- 8 a. Explain with a sketch working of oxy-acetylene welding process. (08 Marks)
 b. Differentiate between Welding, Brazing and Soldering. (06 Marks)
 c. Explain clearly the different types of oxy-acetylene flames generated. (06 Marks)

Module-5

- 9 a. Define Refrigeration and Air conditioning. (04 Marks)
 b. Name commonly used refrigerants. Explain any six good properties of refrigerants. (08 Marks)
 c. Explain with a sketch working of vapour absorption refrigeration system. (08 Marks)

OR

- 10 a. Define :
 (i) Refrigeration effect (ii) Ton of refrigeration (iii) COP
 (iv) Ice making capacity (v) Relative cop (vi) Unit of refrigeration. (06 Marks)
 b. Differentiate between vapour compression and vapour absorption refrigerating system. (06 Marks)
 c. With sketch explain the working of Air conditioner. (08 Marks)

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