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First/Second Semester B.E. Degree Examination, Dec.2024/Jan.2025 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. With a neat sketch, explain briefly hydro-electric power plant. (10 Marks)
- b. Discuss briefly global warming and ozone depletion. (10 Marks)

OR

- 2 a. Define : i) open system ii) closed system. (05 Marks)
- b. State and explain Zeroth law of thermodynamics. (05 Marks)
- c. Explain briefly formation of steam at constant pressure with temperature enthalpy diagram. (10 Marks)

Module-2

- 3 a. Explain briefly the working of Babcock and Wilcox boiler. (10 Marks)
- b. Define turbine. Explain with a neat sketch working of pelton wheel turbine. (10 Marks)

OR

- 4 a. Briefly explain the construction and working of Francis turbine. (10 Marks)
- b. Write short notes on : i) Cavitation ii) Priming. (10 Marks)

Module-3

- 5 a. With a neat sketch, explain constructional details of 2 stroke petrol engine. (10 Marks)
- b. The following datas were obtained for 4-stroke diesel engine.

Cylinder diameter	=	25 cm
Stroke	=	40 cm
Speed	=	250 rpm
Brake load	=	70 Kg
Brake drum diameter	=	2 m
Mean effective pressure	=	6 bar
Diesel oil consumption	=	0.1 m ³ /min
Specific gravity of diesel	=	0.78
Calorific value of fuel diesel	=	43,900 kJ/Kg

 Find i) Brake power ii) Indicated power iii) Friction power iv) Mechanical Efficiency
 v) Brake Thermal Efficiency. (10 Marks)

OR

- 6 a. Define : i) Ton of refrigeration ii) COP iii) Refrigeration effect iv) Ice making capacity v) Refrigeration. (10 Marks)
- b. Explain briefly with a neat sketch working of vapour compression Refrigeration. (10 Marks)

Module-4

- 7 a. Write a note on Ferrous Alloys (Any two). (10 Marks)
- b. Explain briefly the types and applications of Non-Ferrous Alloys (Any three). (10 Marks)

OR

- 8 a. What is Welding? With neat sketch explain arc welding. (10 Marks)
b. With a neat sketch, explain briefly soldering method. (10 Marks)

Module-5

- 9 a. Explain briefly with neat sketches the following lathe operations : (10 Marks)
i) Turning ii) Facing iii) Knurling iv) Drilling.
b. Explain with a neat sketch taper turning by swivelling compound rest method. (10 Marks)

OR

- 10 a. Sketch and explain polar and Cartesian coordinate Robot configuration. (10 Marks)
b. Explain briefly working of horizontal milling machine with a neat sketch. (10 Marks)

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