



CBCS SCHEME

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15EME14/24

First/Second Semester B.E. Degree Examination, June/July 2019 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. Write a note on petroleum based solid fuels. (04 Marks)
- b. With a schematic diagram, explain how solar energy is converted into electrical energy. (08 Marks)
- c. What are boiler mountings and accessories? Give two examples for each. (04 Marks)

OR

- 2 a. Define the following:
 - i) Sensible heat
 - ii) Degree of superheat
 - iii) External work of evaporation
 - iv) Dry saturated steam. (04 Marks)
- b. With a neat sketch explain the working of Bob-Cock and Wilcox boiler. (12 Marks)

Module-2

- 3 a. With a neat sketch explain the working of Kaplan turbine. (08 Marks)
- b. With neat sketches and P-V diagram, explain the working of two stroke petrol engine. (08 Marks)

OR

- 4 a. Differentiate between open cycle and closed cycle gas turbines. (05 Marks)
- b. Mention the function of following:
 - i) Scroll casing
 - ii) Draft tube
 - iii) Piston rings
 - iv) Cam shaft. (04 Marks)
- c. The following observations were recorded during a test on a four stroke engine
Bore = 300mm, stroke = 40mm, speed = 250rpm, net load on the brake drum = 700N,
imep = 6 bar, fuel consumption = 0.0013 kg/s calorific value of fuel = 43900 kJ/kg, brake
drum diameter = 2m. Determine: i) Indicated power ii) Brake power iii) Mechanical
efficiency iv) Brake thermal efficiency. (07 Marks)

Module-3

- 5 a. Explain with a neat sketch taper turning by swivelling of compound rest method. (06 Marks)
- b. What is programmable automation? What are its characteristics? (04 Marks)
- c. With a neat block diagram, explain a CNC system. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. With neat sketches, explain the following machining operations:
i) Boring ii) Counter boring iii) End milling. (09 Marks)
- b. Explain with neat sketch, cylindrical coordinate configuration robot. What are its merits and demerits? (07 Marks)

Module-4

- 7 a. Classify non-ferrous metals. (03 Marks)
- b. Write a note on laminated composites. (06 Marks)
- c. Explain with a neat sketch the working of electric arc welding. (07 Marks)

OR

- 8 a. Mention the properties and uses of grey cast iron. (06 Marks)
- b. Write a note on soldering process. (06 Marks)
- c. List out the differences between brazing and welding. (04 Marks)

Module-5

- 9 a. Define the following:
i) Ton of refrigeration
ii) Coefficient of performance
iii) Air conditioning. (06 Marks)
- b. With a neat sketch, explain the working of room air conditioner. (10 Marks)

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OR

- 10 a. With a neat sketch, explain the working of vapour absorption refrigeration system. (10 Marks)
- b. Differentiate between refrigeration and air conditioning. (06 Marks)
