

CBCS SCHEME

15EME14/24

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First/Second Semester B.E. Degree Examination, Feb./Mar. 2022

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

- Define Renewable Energy Resource and Non – Renewable Energy Resource. Indicate two examples for each. (06 Marks)
 - What is Solar pond and Solar constant? (04 Marks)
 - With a neat sketch, explain the Principle of Operation of a typical Wind mill. (06 Marks)

OR

- With a neat schematic diagram, explain the Principle of Operation of a Nuclear Power Plant. (08 Marks)
 - Explain with a neat sketch, the working of Lancashire Boiler. (08 Marks)

Module-2

- Write any four differences between Impulse and Reaction Steam turbines. (04 Marks)
 - Explain the working principle of Francis turbine, with a neat sketch. (06 Marks)
 - With a neat sketch, explain the working principle of Closed Cycle Gas Turbine. (06 Marks)

OR

- Explain the working principle of four stroke Petrol engine with theoretical PV diagram. (08 Marks)
 - The following data refer to a single cylinder, 4 – Stroke Petrol Engine :
Cylinder diameter = 25cm ; Stroke length = 30cm ; Speed = 600 rpm ; Mass of fuel consumed = 0.12kg/min ; Caloric value of fuel = 42,000 kJ/kg ; Mean effective pressure = 4.8 bar ; Load on the brake drum = 650N ; Radius of the brake drum = 0.5m.
Calculate i) Indicated power ii) Brake power
 iii) Brake specific fuel consumption iv) Indicated thermal efficiency. (08 Marks)

Module-3

- Explain with neat sketches, any two of the following : i) Taper turning by Swiveling of compound rest ii) Thread cutting iii) Knurling. (08 Marks)
 - With neat sketches, explain : i) Slot milling ii) Counter sinking. (08 Marks)

OR

- With schematic diagram, explain the following robot configurations :
i) Polar configuration ii) Cartesian configuration. (08 Marks)
 - Briefly explain Programmable Automation and Flexible Automation. (04 Marks)
 - With a simple block diagram, explain the Principle of NC machine. (04 Marks)

Module-4

- Indicate the applications of Ferrous and Non – ferrous metals. (04 Marks)
 - Distinguish between Soldering and Brazing. (04 Marks)
 - With a neat sketch, explain Oxy – Acetylene Welding process. (08 Marks)

1 of 2

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

- 8 a. Explain the principle of Electric Arc Welding, with a neat sketch. (08 Marks)
b. Define Composite Material. Indicate the applications of Composite materials and its limitations. (08 Marks)

Module-5

- 9 a. What is Refrigeration? List out the properties of a good refrigerant. (06 Marks)
b. With a neat sketch, explain the working principle of Vapour Absorption Refrigeration System. (10 Marks)

OR

- 10 a. Define
i) Refrigerating effect.
ii) COP.
iii) Ton of Refrigeration.
iv) Ice making capacity. (08 Marks)
b. With a neat sketch, explain the principle of Working of a room Air Conditioner. (08 Marks)

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