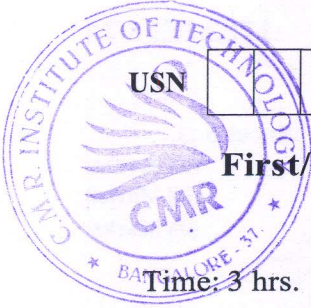


# CBCS SCHEME

17EME14/24



USN

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

## 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. Explain with neat sketch the working principle of Hydro power station. (08 Marks)  
b. What are Biofuels? Compare biofuels with petroleum fuels. (06 Marks)  
c. Define the following term: i) Fuel ii) Calorific value iii) Solar pond. (06 Marks)

OR

- 2 a. Explain the construction and working of Babcock and Wilcox boiler. (08 Marks)  
b. What are advantages of water tube boilers over fire tube boilers? (06 Marks)  
c. Define the following terms: i) Boiler ii) Dryness fraction iii) Sensible heat. (06 Marks)

### Module-2

- 3 a. Explain the working of Pelton wheel with neat sketch. (08 Marks)  
b. Explain the closed cycle gas turbine with block diagram. (06 Marks)  
c. A two stroke diesel engine has a Piston diameter of 200mm and a stroke of 300mm. It has mean effective pressure of 2.8 bar and a speed of 400rpm. The diameter of the brake drum is 1 metre and effective brake load is 64kg. Find the indicated power, brake power and the average Piston speed. (06 Marks)

OR

- 4 a. Explain construction and working of two stroke petrol engine with neat sketch. (08 Marks)  
b. Differentiate between closed and open cycle gas turbine. (06 Marks)  
c. Define the following terms:  
i) Steam Turbine ii) IC Engine iii) Mechanical efficiency of IC engine. (06 Marks)

### Module-3

- 5 a. List the various operations performed on lathe. Explain with neat sketch the thread cutting and facing operations. (08 Marks)  
b. Name the various operations performed on drilling machine. Explain with the neat sketch tapping operation. (06 Marks)  
c. Define the following terms:  
i) Milling ii) Drilling iii) Taper turning. (06 Marks)

OR

- 6 a. Write the classification of Robot based on physical configuration. Explain the cylindrical configuration. (08 Marks)  
b. Explain the types of automation with examples. (06 Marks)  
c. Define the following terms:  
i) Robot ii) Automation iii) Numerical control. (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.



**Module-4**

- 7 a. Define composite materials. Write a note on composite materials and its applications. (08 Marks)  
b. Write a note on non ferrous metals and its alloys (any two). (08 Marks)  
c. How do you classify the Engineering Materials? (04 Marks)

**OR**

- 8 a. Explain Oxy-acetylene welding process with neat sketch. (08 Marks)  
b. Differentiate between welding, brazing and soldering. (06 Marks)  
c. Define brazing. Explain torch brazing with neat sketch. (06 Marks)

**Module-5**

- 9 a. Explain the basic concepts of refrigeration. (06 Marks)  
b. With neat sketch, explain the working of vapour absorption refrigerator. (08 Marks)  
c. Define the following terms:  
i) Ice making capacity  
ii) Tons of Refrigeration  
iii) COP. (06 Marks)

**OR**

- 10 a. With neat sketch, explain the working of Room Air Conditioner. (08 Marks)  
b. What are the desirable properties of a good refrigerant? (08 Marks)  
c. Define the following terms:  
i) Air-conditioning  
ii) Absolute Humidity. (04 Marks)

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