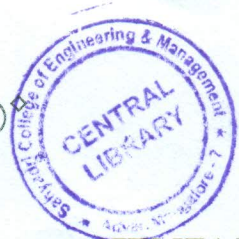


# CBCS SCHEME



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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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