CBCS SCHEME

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15EME14/24

First/Second Semester B.E. Degree Examination, Dec.2019/Jan.2020
Elements of Mechanical Engineering

Time: 3 hrs. Max. Marks: 80

Note: 1. ***Answer any FIVE full questions, choosing ONE full question from each module.***
2. ***Draw relevant and neat sketches, wherever necessary.***

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-1

1 a. Give the classification of Energy sources. **(04 Marks)**
b. Mention the advantages and disadvantages of renewable energy sources. **(05 Marks)**
c. Explain with a neat sketch, harnessing of wind power. **(07 Marks)**

OR

2 a. Explain working principle of water tube boilers and fire tube boilers. **(06 Marks)**
b. Define the following terms :
i) Wet steam ii) Enthalpy iii) Dryness fraction iv) Specific volume. **(04 Marks)**
c. State any three mountings and accessories mentioning their functions. **(06 Marks)**

Module-2

3 a. Differentiate between the impulse and reaction turbines. **(04 Marks)**
b. Draw a constant pressure open cycle gas turbine diagram and explain its working. **(06 Marks)**
c. Give the classification of Internal Combustion engine. **(06 Marks)**

OR

4 a. Give the classification of water turbines. **(04 Marks)**
b. Distinguish between 2 – stroke and 4 – stroke engines. **(05 Marks)**
c. A 4 – stroke engine has a piston diameter 250mm and stroke 400mm. The mean effective pressure is 4 bar and speed is 500 rpm. The diameter of the brake drum is 1000mm and the effective brake load is 400N. Find the indicate power , brake power and frictional power. **(07 Marks)**

Module-3

5 a. With a neat sketch, explain the mechanism of taper turning by swelling compound rest. **(07 Marks)**
b. Briefly explain the following operations :
i) Drilling ii) Plain milling iii) End milling. **(09 Marks)**

OR

6 a. Give the classification of robots and explain Cartesian co-ordinate system. **(06 Marks)**
b. Explain briefly the types of automation. **(06 Marks)**
c. State the applications of robots. **(04 Marks)**

Module-4

7 a. Explain non – ferrous metals and alloys mentioning their applications. **(08 Marks)**
b. Define Composite Materials. List out any four applications of composite materials. **(04 Marks)**
c. Distinguish between Welding and Soldering. **(04 Marks)**

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OR

8 a. Briefly discuss the three types of flames used in gas welding and mention their applications. **(06 Marks)**

b. Define Welding. Explain electric arc welding with a neat sketch. **(06 Marks)**

c. List out the advantages of composite materials. **(04 Marks)**

Module-5

9 a. Define the following terms :

i) Ton of Refrigeration.

ii) Coefficient of Performance.

iii) Ice making capacity.

iv) Refrigeration effect. **(08 Marks)**

b. Define Air conditioning. With a neat sketch, explain the working of a room air conditioner. **(08 Marks)**

OR

10 a. Explain with a sketch, the working of a Vapour Compression refrigeration. **(08 Marks)**

b. List out the desirable properties of an ideal refrigerant. **(04 Marks)**

c. Bring out the differences between vapour absorption and vapour compression refrigeration system. **(04 Marks)**

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