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15EME14

First Semester B.E. Degree Examination, Dec.2015/Jan.2016
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. Define solar constant and explain liquid flat plate collector with a neat sketch. **(08 Marks)**

b. Explain principle of nuclear power plant with a neat sketch. **(08 Marks)**

OR

2 a. Define enthalpy and explain formation of steam with a T-S diagram. **(08 Marks)**

b. Explain Babcock and Wilcox boiler with a neat sketch. **(08 Marks)**

Module-2

3 a. Define Turbine & explain De Laval turbines with a neat sketch and P-V diagram. **(08 Marks)**

b. Explain closed cycle gas turbine with a neat sketch. **(08 Marks)**

OR

4 a. Explain 4-stroke SI engine with a neat sketch and PV diagram. **(08 Marks)**

b. Define indicated power and brake power. A four stroke IC engine running at 450 rpm has a bore diameter of 100 mm and stroke length 120 mm. The indicator diagram details are : Area of the diagram 4 cm^2, length of the indicator diagram 6.5 cm and the spring value of the spring used is 10 bar/cm. Calculate indicated power of the engine. **(08 Marks)**

Module-3

5 a. Explain with neat sketches,
i) Plain milling
ii) End milling.
iii) Slot milling. **(08 Marks)**

b. Explain the following machining operations on lathe machine with suitable sketches:
i) Turning.
ii) Thread cutting.
iii) Knurling
iv) Facing **(08 Marks)**

OR

6 a. Write classification of robot configurations and explain Cartesian coordinate with a suitable sketch. **(08 Marks)**

b. Define automation and explain flexible and fixed automation. **(08 Marks)**

Module-4

7 a. Write classification of ferrous and non-ferrous metals and explain briefly. **(08 Marks)**

b. Write a short note on composites. **(08 Marks)**

OR

8 a. Define soldering and explain electric arc welding with a suitable sketch. **(08 Marks)**

b. Explain oxy-acetylene welding process with a sketch. **(08 Marks)**

Module-5

9 a. Define the following:

i) Ton of refrigeration.

ii) Refrigerating effect.

iii) Ice making capacity

iv) COP **(08 Marks)**

b. Explain principle and working of vapour compression refrigeration with a sketch. **(08 Marks)**

OR

10 a. Explain with a sketch working of room air conditioner. **(08 Marks)**

b. List out properties of a good refrigerant and explain any two. **(08 Marks)**

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