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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 cm², 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)

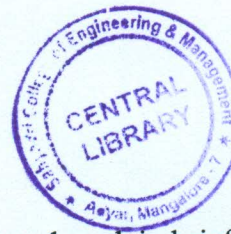
Module-3

- 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)

Important Note : 1. On completing your answers, temporarily draw diagonal cross lines on the remaining blank spaces.
 2. Any revealing of identification, appeal to evaluator, will be treated as malpractice.



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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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