15EME14/24

USN

First/Second Semester B.E. Degree Examination, Dec.2017/Jan.2018
Element 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. Differentiate between conventional and Non conventional energy sources. (04 Marks)
   b. Define Higher calorific value (HCV) and lower calorific value (LCV) of a fuel. (04 Marks)
   c. Explain with a neat sketch working of a wind mill. (08 Marks)

OR

2 a. Explain the terms:
      i) Dry saturated steam
      ii) Wet steam
      iii) Superheated steam
      iv) Degree of superheat. (04 Marks)
   b. Define Boiler mountings and Boiler Accessories. (04 Marks)
   c. Explain with a sketch working of Babcock and Wilcox Boiler. (08 Marks)

Module-2

3 a. Differentiate between working of open cycle and closed cycle Gas turbine. (04 Marks)
   b. How are IC engines classified? (04 Marks)
   c. Explain with a sketch working by simple impulse steam Turbine (De Laval Turbine). (08 Marks)

OR

4 a. Explain with a Pv diagram working of a four stroke Diesel engine. (08 Marks)
   b. A fair stroke diesel engine has a piston diameter of 250mm and stroke of 400mm. Mean effective pressure is 4Bar, Speed is 500 Rpm. Diameter of the Brake drum is 1m and effective Brake load is 400N. Determine Indicated power, Brake power and Frictional power. (08 Marks)

Module-3

5 a. Explain with sketch following operations on Lathe
      i) Knurling
      ii) Thread cutting. (06 Marks)
   b. Sketch and explain cylindrical co-ordinate Robot. (06 Marks)
   c. With a simple Block diagram, explain the element of NC machine. (04 Marks)

OR

6 a. Explain with sketch the following operations a Drilling Machine
      i) Counter Boring
      ii) Countersinking. (06 Marks)
   b. Explain with a sketch Polar configuration Robot. (06 Marks)
   c. What are the objectives of Automation? (04 Marks)

Module-4

7 a. Explain the composites properties and Application of cast Iron (04 Marks)
  b. How are composites classified. (04 Marks)
     Explain with a sketch working of electric Arc welding. (08 Marks)

OR

8 a. What are the applications of composites in Automobile and Aerospace Industry? (04 Marks)
  b. Differentiate between soldering, Brazing, Welding. (04 Marks)
  c. Explain the process of
     i) Soldering
     ii) Brazing. (08 Marks)

Module-5

9 a. Define :
     i) Refrigeration
     ii) Air conditioning (04 Marks)
  b. List the commonly used Refrigerants. (04 Marks)
  c. Explain with a sketch working of vapour absorption Refrigerating system. (08 Marks)

OR

10 a. Differentiate between working of Vapour compression and vapour absorption Refrigerating system. (04 Marks)
   b. Define the terms :
      i) Refrigerant
      ii) Refrigerating effect
      iii) COP
      iv) ICE making capacity. (04 Marks)
   c. Explain with sketch working of window Air conditioner. (08 Marks)

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