18ME15/25

Second Semester B.E. Degree Examination, June/July 2019 **Elements of Mechanical Engineering**

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Max. Marks: 100

Note: 1. Answer FIVE full questions, choosing one full question from each module. 2. Use of Steam table is permitted.

Module-1

(ii) Ozone depletion

List and explain any one source of energy.

(06 Marks)

Explain briefly: (i) Global Warming

(06 Marks)

Find the enthalpy of 1 kg of steam at 12 bar when,

Steam is dry saturated. (i)

Steam is 22% wet and (ii)

Super heated to 250°C (iii)

Assume the specific heat of the super heated steam as 2.25 KJ/kgK.

(08 Marks)

Explain briefly any two of the following:

Zeroth law of thermodynamics. (i)

First law of thermodynamics. (ii)

(06 Marks)

(iii) Second law of thermodynamics. Explain formation of steam with the help of Temperature-Enthalpy (T-h) diagram. (08 Marks)

Find the specific volume and enthalpy of 1 kg of steam at 0.8 MPa.

When the dryness fraction is 0.9.

When the steam is super heated to a temperature of 300°C. (ii)

The specific heat of the super heated steam is 2.25 KJ/kgK.

(06 Marks)

Module-2

With a neat labeled diagram, explain working of Babcock and Wilcox boiler. (08 Marks) 3

Define prime movers and explain working of Pelton wheel turbine with a neat sketch. b.

(12 Marks)

OR

(ii) Boiler Accessories. Define (i) Boiler Mountings.

Explain functions of any five mountings or accessories.

(12 Marks)

What are hydraulic pumps? Explain centrifugal pump with a neat sketch.

(08 Marks)

Module-3

Explain 4-s petrol engines with P-V diagram. 5

(10 Marks)

Give comparisons between petrol and diesel engines.

(05 Marks)

A four stroke IC engine running at 450 rpm has a bore diameter of 100 mm and stroke length 120 mm. The indicated diagram details are,

(i) Area of the diagram 4 cm²

(ii) Length of the indicated diagram 6.5 cm

(iii) Spring value of the spring used 10 bar/cm.

Calculate the indicated power of the engine.

(05 Marks)

OR

6 a. Explain with a near sketch working of vapour compression Refrigerator. b. Define: (i) Toon of Refrigerants and mention the applications of air conditioners. (68 Marks) Module-4 7 a. Classify ferrous and non ferrous metals. b. Define composites, explain any two of the following: (i) Piezoelectric materials. (ii) Shape memory alloys (iii) Optical fibre glass. (26 Marks) C. Classify metal joining processes, explain TIG (Tungsten Inert Gas) Welding with a neat sketch. OR a. Derive an expression for length of the belt in open belt drive. (b. Mention advantages and disadvantages of V-Belt drive. (c. List different types of gears and explain any one with its advantages. (b) Module-5 9 a. Explain briefly the following: (i) Turning (ii) Facing (iii) Thread cutting b. Explain the working of horizontal milling machine with a simple line diagram. (b) Marks) Define Robots and mention its general applications. (b) Marks) OR CMRIT LIBRAKY ENNIGALORS—550 037 10 a. Explain briefly the components of a CNC machine with a neat block diagram. (b) Define Robots and mention its general applications. (c) Write short note on: CNC Machining Center or Turning Center. (b) Marks)				OR OR	
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