CBCS SCHEME

USN | | | | | | | | | | |

15EME14/24

First/Second Semester B.E. Degree Examination, June/July 2019
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. Write a note on petroleum based solid fuels. **(04 Marks)**
   b. With a schematic diagram, explain how solar energy is converted into electrical energy. **(08 Marks)**
   c. What are boiler mountings and accessories? Give two examples for each. **(04 Marks)**

OR

2 a. Define the following:
   i) Sensible heat
   ii) Degree of superheat
   iii) External work of evaporation
   iv) Dry saturated steam. **(04 Marks)**
   b. With a neat sketch explain the working of Bob-Cock and Wilcox boiler. **(12 Marks)**

Module-2

3 a. With a neat sketch explain the working of Kaplan turbine. **(08 Marks)**
   b. With neat sketches and P-V diagram, explain the working of two stroke petrol engine. **(08 Marks)**

OR

4 a. Differentiate between open cycle and closed cycle gas turbines. **(05 Marks)**
   b. Mention the function of following:
   i) Scroll casing
   ii) Draft tube
   iii) Piston rings
   iv) Cam shaft. **(04 Marks)**
   c. The following observations were recorded during a test on a four stroke engine Bore = 300mm, stroke = 40mm, speed = 250rpm, net load on the brake drum = 700N, imep = 6 bar, fuel consumption = 0.0013 kg/s calorific value of fuel = 43900 kJ/kg, brake drum diameter = 2m. Determine: i) Indicated power ii) Brake power iii) Mechanical efficiency iv) Brake thermal efficiency. **(07 Marks)**

Module-3

5 a. Explain with a neat sketch taper turning by swiveling of compound rest method. **(06 Marks)**
   b. What is programmable automation? What are its characteristics? **(04 Marks)**
   c. With a neat block diagram, explain a CNC system. **(06 Marks)**

OR

6 a. With neat sketches, explain the following machining operations:
   i) Boring   ii) Counter boring   iii) End milling. **(09 Marks)**
  b. Explain with neat sketch, cylindrical coordinate configuration robot. What are its merits and demerits? **(07 Marks)**

Module-4

7 a. Classify non-ferrous metals. **(03 Marks)**
  b. Write a note on laminated composites. **(06 Marks)**
  c. Explain with a neat sketch the working of electric arc welding. **(07 Marks)**

OR

8 a. Mention the properties and uses of grey cast iron. **(06 Marks)**
  b. Write a note on soldering process. **(06 Marks)**
  c. List out the differences between brazing and welding. **(04 Marks)**

Module-5

9 a. Define the following:
   i)   Ton of refrigeration
   ii) Coefficient of performance
   iii) Air conditioning. **(06 Marks)**
  b. With a neat sketch, explain the working of room air conditioner. **(10 Marks)**

OR

10 a. With a neat sketch, explain the working of vapour absorption refrigeration system. **(10 Marks)**
   b. Differentiate between refrigeration and air conditioning. **(06 Marks)**

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