

CBCS SCHEME

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17EME14/24

First/Second Semester B.E. Degree Examination, July/August 2021 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1 a. Differentiate between Renewable and Non-Renewable energy resources with examples. (06 Marks)
b. Explain how wind energy is converted into electrical energy with a suitable sketch. (10 Marks)
c. Discuss the merits and demerits of Bio fuels. (04 Marks)
- 2 a. How are Boilers classified? Explain. (06 Marks)
b. Differentiate between fire tube and water tube boilers. (06 Marks)
c. What are Boiler mountings and accessories? Explain the function of any three boiler mountings. (08 Marks)
- 3 a. Enumerate the difference between impulse and Reaction steam turbines. (06 Marks)
b. Explain with a neat sketch, working of closed cycle gas turbine. (08 Marks)
c. Sketch Pelton wheel and briefly discuss the components of it. (06 Marks)
- 4 a. Draw a neat sketch of I.C engine and label its parts. (06 Marks)
b. Distinguish between S.I engine and C.I engine. (06 Marks)
c. A single cylinder 4-stroke I.C engine has a bore of 180mm, stroke of 200mm and a rated speed of 300 rpm. Torque on the brake drum is 200N-m and mean effective pressure is 6 bar. It consumes 4kg of fuel in one hour. The calorific value of fuel is 42000 kJ/kg.
Determine :
i) Brake power
ii) Indicated power
iii) Brake thermal efficiency
iv) Mechanical efficiency. (08 Marks)
- 5 a. Define knurling and Thread cutting operations. Also explain Taper turning by swiveling the compound rest method. (10 Marks)
b. With the help of neat sketches, discuss briefly the following operations.
i) Boring
ii) Counter sinking
iii) Slot milling (10 Marks)
- 6 a. How are Robots Classified? Explain with a neat sketch any two configurations of Robots. (10 Marks)
b. Distinguish between fixed, programmable type of automation. (05 Marks)
c. Draw the block diagram of NC machine and describe its components. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

- 7 a. How are Ferrous and Non-ferrous metals classified? Discuss with suitable examples. (08 Marks)
b. Explain the classification of composite materials. (06 Marks)
c. Mention the three applications of Ferrous and Non-ferrous metals and their alloys. (06 Marks)
- 8 a. Distinguish between soldering and Brazing. (04 Marks)
b. Give the classification on welding and mention the applications of welding. (06 Marks)
c. With a neat sketch, explain oxyacetylene welding process. (10 Marks)
- 9 a. List any six properties of an ideal Refrigerant. (06 Marks)
b. Define the terms :
i) Ton of Refrigeration
ii) C.O.P (04 Marks)
c. Explain the working of vapour compression Refrigeration system. (10 Marks)
- 10 a. List the commonly used Refrigerants. (04 Marks)
b. Compare vapour compression and vapour absorption Refrigeration system. (06 Marks)
c. Explain the working of Room air conditioner. (10 Marks)

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