

First/Second Semester B.E. Degree Examination, Aug./Sept.2020
Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
 2. Use of steam tables is permitted.*

Module-1

- | | | |
|---|---|------------|
| 1 | a. Differentiate renewable energy sources with non-renewable sources. | (04 Marks) |
| | b. Briefly explain Global Warming and Ozone depletion. | (08 Marks) |
| | c. Define Zeroth, 1 st law, 2 nd law and 3 rd law of thermodynamics. | (08 Marks) |

OR

- | | | |
|---|---|------------|
| 2 | a. Define | |
| | (i) Internal energy | |
| | (ii) Enthalpy | |
| | (iii) Entropy | (06 Marks) |
| | b. Explain the formation of steam. | (06 Marks) |
| | c. Explain briefly the application of hydel, wind, nuclear and bio-fuels. | (08 Marks) |

Module-2

- | | | |
|---|---|------------|
| 3 | a. Explain the working of Lancashire boiler with neat sketch. | (10 Marks) |
| | b. With neat sketch, explain working of Francis turbine. | (10 Marks) |

OR

- | | | |
|---|--|------------|
| 4 | a. List and explain functions of any four boiler mountings. | (06 Marks) |
| | b. Explain the working of centrifugal pump with neat sketch. | (08 Marks) |
| | c. Explain the phenomenon of priming and cavitation in pump. | (06 Marks) |

Module-3

- | | | |
|---|---|------------|
| 5 | a. Explain the working of four-stroke diesel engine with neat sketch. | (10 Marks) |
| | b. A single cylinder two stroke petrol engine develops 7.5 KW at 2500 rpm. The mean effective pressure on the piston is 8 bar and mechanical efficiency is 80%. Calculate the diameter and stroke length of the cylinder if stroke to bore ratio is 1.5, also calculate the fuel consumption rate if the brake thermal efficiency is 28%. The calorific value of the fuel used is 43,900 KJ/kg. | (10 Marks) |

OR

- | | | |
|---|---|------------|
| 6 | a. Define | |
| | (i) Refrigerating effect | |
| | (ii) Tonn of refrigeration | |
| | (iii) Ice making capacity | |
| | (iv) Coefficient of performance | |
| | (v) Unit of refrigeration | (10 Marks) |
| | b. With a neat sketch, explain the working of vapour compression refrigeration. | (10 Marks) |

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