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First/Second Semester B.E. Degree Examination, June/July 2017
Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer FIVE full questions, selecting ONE full question from each module.
2. Draw the sketches neatly.

Module – 1

- 1 a. Classify renewable and non-renewable energy sources and explain. (10 Marks)
 b. Name some of the bio-fuels used in engineering applications. (05 Marks)
 c. Explain the principle of solar photovoltaic cell. (05 Marks)
- 2 a. Classify the fuels and explain i) Calorific value ii) Combustion. (08 Marks)
 b. Explain the properties of steam and explain the formation of steam with a neat sketch. (08 Marks)
 c. List the boiler mountings and accessories. (04 Marks)

Module – 2

- 3 a. Explain Parson's Turbine working principle. (06 Marks)
 b. Classify Turbines in detail. (04 Marks)
 c. With P-V diagram, explain four stroke diesel engines. (10 Marks)
- 4 a. With a neat sketch, explain Two stroke petrol engines. (08 Marks)
 b. Explain principle and working of Pelton wheel. (06 Marks)
 c. In a 4-stroke diesel engine has a piston diameter 250mm, stroke 400mm, MEP = 4 bar and speed is 500rpm. Diameter of brake drum is 1000mm. Effective brake load is 400N, Calculate IP, BP and FP. (06 Marks)

Module – 3

- 5 a. Classify the robots based on configuration. (06 Marks)
 b. What are the advantages and disadvantages of automation? (06 Marks)
 c. Explain any four kinds of operations performed on Lathe machine. (08 Marks)
- 6 a. Explain any four drilling operations performed on drilling machine. (08 Marks)
 b. What are the advantages and disadvantages of robots? (06 Marks)
 c. Explain fixed and flexible automation process. (06 Marks)

Module – 4

- 7 a. Classify the engineering materials. (06 Marks)
 b. Classify the composite materials and its application in Aircraft and Automobile application. (08 Marks)
 c. With a neat sketch, explain oxy-Acetylene welding. (06 Marks)
- 8 a. With a neat sketch, explain Arc welding. (06 Marks)
 b. What are the differences between soldering, welding and brazing? (06 Marks)
 c. List the applications of ferrous alloys. (04 Marks)
 d. Write a note on composite applications. (04 Marks)

Module – 5

- 9 a. What are the properties of good refrigerant? (06 Marks)
 b. Explain the principle of working of vapour Absorption refrigeration with sketch. (10 Marks)
 c. Define the terms : i) COP ii) Unit of refrigeration. (04 Marks)
- 10 a. Explain the working principle of room air-conditioning with a neat sketch. (10 Marks)
 b. List commonly used refrigerants and its properties. (06 Marks)
 c. Define the terms : i) Ton of refrigeration ii) Refrigerating effect. (04 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.