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14EME14/24

First/Second Semester B.E. Degree Examination, June/July 2015
Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks:100

*Note: Answer FIVE full questions, selecting
ONE full question from each part.*

PART — A

- 1 a. What are the advantages and disadvantages of renewable and non renewable energy sources? (05 Marks)
- b. What is calorific value? Compare biofuels with petroleum fuels in terms of calorific value. (05 Marks)
- c. Explain with neat sketch, working of Babcock and Wilcox boiler. (10 Marks)
- 2 a. Explain briefly the principle of conversion of solar energy directly into electrical energy in a solar cell. (10 Marks)
- b. Write a short note on wind energy and its conversion. (10 Marks)

PART — B

- 3 a. Differentiate between reaction and impulse turbines. (05 Marks)
- b. With neat sketch explain the working of pelton wheel. (10 Marks)
- c. Differentiate between petrol engine and diesel engine. (05 Marks)
- 4 a. With neat sketch explain working of 4 stroke diesel engine. (10 Marks)
- b. With neat sketch explain the working of close cycle gas turbine. (06 Marks)
- c. Define : Thermal efficiency and mechanical efficiency of IC engine. (04 Marks)

PART — C

- 5 a. Name the various operations carried out on lathe. Explain taper turning by swivelling compound rest. (08 Marks)
- b. What is milling? With neat sketch explain end-milling and plane milling operations. (06 Marks)
- c. Differentiate between: (i) face sinking and counter boring, (ii) Reaming and Boring. (06 Marks)
- a. Define Robot. Write classification based on robot physical configuration. Write down the applications of industrial robot. (08 Marks)
- b. What is automation? Explain the types of automation with examples. (07 Marks)
- c. With block diagram explain basic components of NC system. (05 Marks)

PART — D

- 7 a. What are ferrous metal? Write a note on stainless steel. Write down its applications. (08 Marks)
- b. Differentiate between ferrous and non ferrous materials. (06 Marks)
- c. What is soldering? Classify soldering process. (06 Marks)
- a. Define welding. Explain electric arc welding process. Write down its demerits. (08 Marks)
- b. Differentiate between welding, Brazing and soldering. (06 Marks)
- c. Define composite materials. Write down its practical applications. (06 Marks)

PART — E

- 9 a. What are the required properties of a good refrigerant? (06 Marks)
- b. With neat sketch explain the working of vapour compression refrigeration system. (10 Marks)
- c. What is air conditioning? Why it is necessary? (04 Marks)
- 10 a. Define : (i) Refrigeration effect (ii) Unit of Refrigeration (iii) COP of Refrigeration. (06 Marks)
- b. List the commonly used refrigerants. (04 Marks)
- c. Explain with neat sketch the principle of room air-conditioner. (10 Marks)
