CBCS SCHEME

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17EME14/24

First/Second Semester B.E. Degree Examination, Dec.2018/Jan.2019
Elements of Mechanical Engineering

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain petroleum based gaseous fuels. **(06 Marks)**
b. Explain the principle and working of a wind will with neat sketch. **(08 Marks)**
c. Bio-fuels are alternate for fosil fuels, explain. **(06 Marks)**

OR

2 a. Explain with neat sketch the construction and working of Babcock and Wilcox boiler. **(10 Marks)**
b. List the differences between fire tube and water tube boilers. **(06 Marks)**
c. Explain any 4 devices which are necessary for safe operation of boilers. **(04 Marks)**

Module-2

3 a. Explain with neat sketch Parson turbine and its pressure velocity diagram. **(08 Marks)**
b. List the differences between open cycle and closed cycle gas turbine. **(06 Marks)**
c. Explain the constructions and working of a Kaplan turbine with neat sketch. **(06 Marks)**

OR

4 a. Bring out the comparisons between 2-stroke and 4-storke IC engine. **(06 Marks)**
b. Explain with neat sketch a 4 stroke engine where combustion of fuel takes place at constant pressure. **(07 Marks)**
c. A gas engine working on a 4 stroke cycle has a cylinder diameter of 0.25m and length 0.45m and running at 180RPM. Its mechanical efficiency is 80% and when man effective pressure is 6 bar. Find the indicated power, break power and frictional power. What is its fuel consumption rate (kg/hr) and break specific fuel consumption (kg/kw h) if the energy content of the fuel is 42,000 kJ/kg and brake thermal efficiency is 25%. **(07 Marks)**

Module-3

5 a. Explain knurling operations with a neat sketch. **(06 Marks)**
b. Explain with neat sketches counter sinking and counter boring operations. **(08 Marks)**
c. List the various milling operations and explain a milling operation using side and face cutter. **(06 Marks)**

OR

6 a. Classify robots based on physical configuration and explain a robot which has a work envelop of hemisphere with neat sketch. **(08 Marks)**
b. Explain the necessity of automation and important features of flexible automation. **(06 Marks)**
c. List any 2 advantages, limitations and applications of NC/CMC machines. **(06 Marks)**

Module-4

7 a. Explain composite materials and its need in today's word. **(06 Marks)**
b. Classify Ferrous metals with suitable example. **(06 Marks)**
c. Define non-ferrous metals and explain any two non-ferrous metals and two alloys. **(08 Marks)**

OR

8 a. List out the comparison between soldering and barzing. **(06 Marks)**
b. Explain with neat sketch the electrodes used in arc welding and its functions. **(06 Marks)**
c. Explain oxy-acitylene welding process with neat sketch. **(08 Marks)**

Module-5

9 a. Define refrigerant and explain commonly used refrigerant (any 3). **(06 Marks)**
b. Explain with neat sketch the principles and working of a vapour compression refrigerator. **(08 Marks)**
c. Define the following : i) ton of refrigeration ii) coefficient of performance iii) relative COP. **(06 Marks)**

OR

10 a. Explain with a neat sketch, working of room air conditioner. **(08 Marks)**
b. Explain with neat sketch the working of vapor absorbtion refrigerator. **(08 Marks)**
c. List out the properties of a good refrigerant. **(04 Marks)**

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