24008

B. Tech. 1st Semester F-Scheme Examination,

December–2014

BASICS OF MECHANICAL ENGINEERING

Paper–ME-101-F

Time allowed : 3 hours] *[Maximum marks : 100*

Note : *Attempt **5** questions. **Question No. 1 is compulsory.***
*Attempt any **one** question from each other sections.*

1. Explain the following :

(a) Advantages of NC system

(b) Types of load

(c) Human comfort

(d) Steam generator

(e) Metal cutting

(f) Draft tube

(g) Brittle material

(h) Pulley

(i) Superheating

(j) Yield point.

Section–A

2. (a) Discuss two statements of second law of thermodynamics.

(b) Find the internal energy of 1 kg of super heated steam at a pressure of 10 bar and 300°C. If this steam is expanded to 1.5 bar and dryness, find the change in internal energy. 8

(c) Describe feed mechanism of a slotting machine. 4

3. (a) Describe various milling operations. 6

(b) What is throttling of steam ? State limitations of throttling calorimeter. 6

(c) Derive expression for work done in a closed system for polytropic process. 8

Section–B

4. (a) Classify hydraulic turbines on the basis of type of action with neat sketches. 8

(b) Explain psychrometric chart with its uses. 8

(c) Define refrigeration effect. 4

5. (a) What is a refrigerant ? State its properties. 8

(b) Discuss the working principle of a reaction turbine. 6

(c) What is specific speed of a hydraulic turbine ? How will you select a hydraulic turbine on the basis of specific speed ? 6

Section–C

6. (a) What is Hook's law ? State different elastic constants. 8

   (b) State the advantages of V-belt drive over Flat belt drive. 6

   (c) Differentiate stress and pressure with neat sketch. 6

7. (a) What is power transmission ? What are its primary elements ? 8

   (b) Discuss three mechanical properties of a steel material. 8

   (c) What is gear drive ? Discuss its function. 6

Section–D

8. (a) Justify the necessity for NC machines. 8

   (b) How do you classify the NC machine tools ? 8

   (c) Give the application of NC machines. 4

9. (a) Compare NC and CNC machine tools. 8

   (b) List the advantages of CNC over NC. 4

   (c) Explain general configuration of CNC system.. 8