B. Tech. 1st Semester F- Scheme Examination, December – 2016

BASIC OF MECHANICAL ENGG.

Paper–ME-101-F

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

Note :   *Attempt five questions.* ***Question no. 1 is compulsory.*** *Attempt any one question from each section.*

1. Explain following :

   (a) Working principle of lathe machine

   (b) Functions of draft tube

   (c) Uses of gear drive

   (d) Functions of manufacturing system

   (e) 3rd law of thermodynamics with suitable example.

   4×5=20

Section–A

2. (a) What is a shaper ? What are its principle parts. 4

   (b) Explain sensible heat and latent heat with suitable example.   6

   (c) An air cycle is completed by two processes. In the compression process, 240kJ of work is done on air while 100kJ of heat is rejected to the surroundings. In the expansion process, air does 320kJ of work. Calculate the quantity of heat added to the cycle.   10

3. (a) Explain the principle of milling machine. Describe its working also. 10

(b) Find out an expression for specific enthalpy of wet steam. 6

(c) Explain zeorth law of thermodynamics. 4

Section–B

4. (a) Determine the COP of simple vapour compression refrigeration system. 8

(b) What is the principle of reaction turbine ? Explain working of Kaplan turbine with neat sketch. 8

(c) Explain specific speed for a turbine. 4

5. (a) Define Refrigeration and Refrigeration effect. 6

(b) What are the properties of a refrigerant ? 6

(c) Explain the construction and working of reciprocation pump. 8

Section–C

6. (a) Explain gear terminology with neat sketch. 10

(b) What is Poisson's ratio ? Explain lateral and longitudinal strains with suitable example. 6

(c) Explain flexural loading. 4

7. (a) Derive an expression for relation between three elastic constants. 10

(b) Explain cone clutch with neat sketch. 6

(c) Differentiate between a fast and loose pulley 4

Section–D

8. What is a manufacturing system ? Describe need of manufacturing system. Explain its elements in detail. 20

9. What is Numerical control system ? What are elements of NC machine ? Describe need of NC system. 20