

Roll No.

OLE-24008

B. Tech. 1st Semester (Common for All Branches) Examination – April, 2021 BASICS OF MECHANICAL ENGG.

Paper : ME-101-F

Time : Three hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions by selecting at least any *one* question from each section.

1. Explain the following : 2 × 10 = 20
- (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 example
 - (f) Introduction to manufacturing systems
 - (g) Hook's law
 - (h) Human comforts
 - (i) Poisson's ratio
 - (j) 1st law of thermodynamics

SECTION – A

2. (a) Explain the shaper machine tool with neat and clean diagram. 20
- (b) Explain the 2nd law of thermodynamics in detail.
3. Write short notes on the following : 20
- (a) Use of a steam table
- (b) Find out expression for specific enthalpy of wet steam.
- (c) Zeroth law of thermodynamics.

SECTION – B

4. (a) Determine the COP of Simple Vapour Compression refrigeration system. 20
- (b) Explain specific speed for a turbine.
- (c) What is the principle of Reaction turbine ? Explain working of Kaplan turbine with neat sketch.
5. (a) Obtain an expression for unit speed, unit discharge and unit power for a turbine. 10
- (b) Describe briefly the function of various main components of Pelton turbine with neat sketches. 10

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 a manufacturing system. Explain its elements in detail. 20
9. What is numerical control system ? What are elements of NC machines ? Describe need of NC system. 20