

24008

B.Tech. 2nd Semester Common for all Branches

(F-Scheme) Examination, July-2022

BASICS OF MECHANICAL ENGINEERING

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 the following : 5×4=20
- (a) Human comforts
  - (b) Introduction to manufacturing system
  - (c) Hook's Law
  - (d) 1<sup>st</sup> Law of Thermodynamic
  - (e) Poisson's ratio

**Section-A**

2. (a) Explain the milling operations. 10
- (b) Explain the 2<sup>nd</sup> law of thermodynamic in detail. 10
3. (a) How would you find Dryness fraction of steam by throttling calorimeter? 10
- (b) Explain the formation of steam at constant pressure. 10

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**Section-B**

4. Describe, with a neat schematic arrangement, the working of a simple vapour compression refrigeration cycle. Represent the cycle on P-V and T-S plots. 20
5. Explain the constructional details of Francis turbine with the help of neat sketch diagram. 20

**Section-C**

6. Derive an expression for the length of flat belt between two pulleys for cross belt drive. 20
7. Derive the torsion equation. 20

**Section-D**

8. (a) Explain the components of a manufacturing system. 10  
(b) What are the absolute and incremental methods of positioning in NC and CNC machine tools? 10
9. (a) How a CNC machine differs from a NC machine? Name the main components of a CNC system. 10  
(b) Explain the difference between open and closed loop system control systems in relation to NC and CNC machine systems. 10