

LNCT UNIVERSITY, BHOPAL

Enrolment No.

**CS-204
B.TECH I & II SEMESTER
EXAMINATION [JUNE-2025]
MECHANICAL ENGINEERING****Maximum Marks:70****Time Allowed:3Hours****Note: -Attempt all questions Internal choice are given.****(SECTION -A)****1. Short Answer Type Questions (Attempt Any Five)****[5x6=30]**

- i. Define mechanical properties of engineering materials. State any twelve properties.
- ii. Draw and explain Iron-Carbon equilibrium diagram.
- iii. Define welding process, give its classification and explain electric arc welding process.
- iv. What is casting? Give its types and describe three casting defects with diagram.
- v. Explain Carnot cycle with suitable PV and TS diagrams and give expression for thermal efficiency.
- vi. State and prove Pascal's law. Write applications based on Pascal's law?
- vii. Discuss different types of errors in measurement. Also explain accuracy and precision.

(SECTION -B)**2. Long Answer Type Questions (Attempt Any Four)****[4x10=40]**

- i. Make calculations for the minimum diameter of a steel wire which is required to raise a load of 6 kN. Presume that the wire can sustain a maximum stress of 120 MN/m². Also calculate extension in 3 m length of the wire. Take modulus of elasticity $E = 200 \text{ GPa}$.
- ii. Explain Principle, construction and function of the Lathe Machine parts with the neat sketch.
- iii. A flat plate of area $1.5 \times 10^6 \text{ mm}^2$ is pulled with speed of 0.4 m/s relative to another plate located at a distance of 0.15 mm from it. Find the force and power required to maintain this speed, if the fluid separating them is having viscosity as 1 poise. [1 poise = 0.1 N s/m^2]
- iv. Calculate the specific weight, density and specific gravity of one litre of liquid which weighs 7N.
- v. A reversed Carnot cycle engine receives heat at -10°C and delivers it at 30°C . the power input is 4.8kW. What is the heating and the refrigerating effect?
- vi. Explain the working of manometer for pressure measurement. Also relate absolute pressure, gauge pressure and vacuum pressure.