

Total number of printed pages-3

53 (FPT 504) MDPE

2021

**MECHANICAL DESIGN OF PROCESS
EQUIPMENT**

Paper : FPT 504

Full Marks : 100

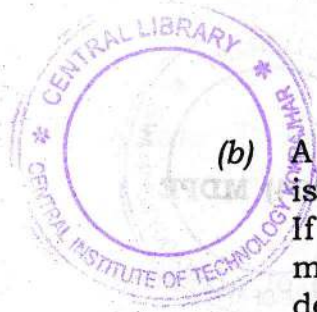
Time : Three hours

**The figures in the margin indicate
full marks for the questions.**

Answer **any five** questions.

1. (a) What is Machine Design ? What are the basic procedures of Machine Design ? Explain. 2+8=10
- (b) What are the basic requirements of Machine elements ? Discuss. 10
2. (a) State Hook's law and find out the mathematical expression of Young's modulus. 2+8=10

Contd.



(b) A rod 160 cm long and a diameter 3 cm is subjected to an axial pull of 30 kN. If the modulus of elasticity of the material of the rod is $2 \times 10^5 \text{ N/mm}^2$, determine —

- (i) the stress
- (ii) the strain
- (iii) the elongation of the rod.

3+3+4=10

3. (a) What is stress-strain diagram? Explain with diagram. What are the properties that can be obtained from the test? Explain. 3+7=10

(b) What is BEP? Explain with suitable diagram. What are the different types of costs involved in Machine design. 5+5=10

4. (a) What is shear stress and shear strain? Discuss with diagram. 5+5=10

(b) Differentiate between : 5+5=10

- (i) Ductility and Brittleness
- (ii) Stress and Strain.

-
5. (a) What is Joint Efficiency Factor?
Discuss different types of joints. 3+7=10
- (b) Discuss the classification of pressure vessel. 10
6. Write short notes on : **(any four)** 5×4=20
- (a) Plasticity
- (b) Elastic limit
- (c) Double pipe heat exchanger (DPHE)
- (d) Manufacturability
- (e) Rigidity.

