



Term Evaluation (Odd) Semester Examination September 2025

Roll no.....

Name of the Course: B Tech. **(ME)**

Semester: V

Name of the Paper: Design of Machine elements-1

Paper Code: TME-502

Time: 1.5 hour

Maximum Marks: 50

Note:

- (i) Answer all the questions by choosing any one of the sub-questions
- (ii) Each question carries 10 marks.

Q1. (10 Marks)

a. What do you understand by design philosophy? Justify your answer. (CO1, CO3)

OR

b. Write a short note on (i) Adoptive design, (ii) Developmental design and (iii) New design, (iv) Rationale design and (v) Empirical Design. (CO1, CO4)

Q2. (10 Marks)

a. What are the factors to be considered while designing a new product? (CO2, CO5)

OR

b. What is standardization and interchangeability? Explain the concept of preferred numbers using suitable examples. (CO1, CO4)

Q3. (10 Marks)

a. Explain clearance fit, transition fit and interference fit using suitable example. Discuss standard tolerance and fundamental deviation with the help of neat sketch (CO2, CO1)

OR

b. Discuss common engineering materials and explain their physical and mechanical properties. (CO4, CO5)

Q4. (10 Marks)

a. Write a short note on stress tensor and explain the state of stress with the help of stress matrix for a cantilever beam subjected to constant torque and longitudinal load. (CO4, CO3)

OR

b. What are internal stresses, explain all the internal stresses with the help of respective equations. (CO3, CO1)

Q5. (10 Marks)

a. What are principle stresses? Discuss the failure mechanism for ductile material (CO3, CO4)

OR

b. Write a brief note on stress concentration factor and factor of safety. (CO3, CO5)

Note For the question paper setters:

- Question paper should cover all the COs of the course.
- Please specify COs against each question.