



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-I

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.