Reg. No. | | | | | | | | | | | |

M.I.E.T. ENGINEERING COLLEGE
(AUTONOMOUS)

Tiruchirappalli-620007

Continuous Internal Assessment – I

2025 – 26 Even Semester
Mechanical Engineering
Fourth Semester

ME234 – THERMODYANMICS

Date : 20-02-2026 **Session : FN**

Time : 02.00 Hours **Maximum Marks: 60**

PART-A (6 X 2 = 12 MARKS)

Answer All the questions

Q. No.	Questions	CO	BTL
1	Define the term “stress and strain”.	CO1	L2
2	Differentiate the rigid body from elastic body.	CO1	L4
3	List the assumptions made in the analysis of bars for composite sections.	CO1	L3
4	What is meant by principal plane and principal stress?	CO1	L1
5	Mention the various types of beams.	CO2	L2
6	What are the sign conventions used for shear force and bending moment calculations?	CO2	L1

PART-B (3 X 16 = 48 MARKS)

Answer either (a) or (b) in each Question

Q. No.		Questions	CO	BTL
7	(a)	The bar shown in figure is subjected to a tensile load of 160 KN. If the stress in the middle portion is limited to 150 N/mm2 , determine the diameter of the middle portion if the total elongation of the bar is to be 0.2 mm. Young’s modulus is given as equal to 2.1×105 N/mm2	CO1	L2
		Or		

Q. No.		Questions	CO	BTL
	(b)	A steel rod of 3 cm diameter is enclosed centrally in a hollow copper tube of external diameter of 5 cm and internal diameter 4 cm. The composite bar is ten subjected to an axial pull of 45000 N. If the length of each bar is equal to 15 cm, Determine, i. The stresses in the rod and tube, and ii.Load carried by each bar. Take E for steel = 2.1 x 105 N/mm2 and for copper = 1.1 x 105 N/mm2		
8	(a)	A tensile test was conducted on a mild steel bar. The following data was obtained from the test: (i) Diameter of the steel bar =3 cm (ii) Gauge length of the bar = 20 cm (iii) Load at elastic limit = 250 kN (iv) Extension at a load of 150 kN =0.21 mm (v) Maximum load = 380 kN (vi) Total extension = 60 mm (vii) Diameter of the rod at failure =2.25 cm Determine (a) Young's modulus (b) the stress at elastic limit (c) the percentage of elongation and (d) the percentage of decrease in area.	CO1	L2
	Or			
	(b)	The tensile stresses at a point across two mutually perpendicular planes are 120 N/mm² and 60 N/mm². Determine the normal, tangential and resultant stresses on a plane inclined at 30° to the axis of the minor stress. A point in a strained material is subjected to stresses as shown in below figure. i. Construct Mohr's circle and determine the normal and tangential stresses across the oblique plane. ii. Compare the answer with analytical method by applying formula		
9	(a)	A cantilever beam of length 2 m carries the point loads as shown in below figure. Draw the shear force and bending moment diagrams for the cantilever beam.	CO2	L1
	Or			
	(b)	A cantilever of length 2 m carries a uniformly distributed load of 2kN/m length over the whole length and a point load of 3 kN at the free end. Draw the S.F and B.M diagrams for the cantilever		

Weightage of CO

BTL		CO1	CO2	CO3	CO4	CO5	Total Marks	Total Marks (%)
Remember (L1)	**Q. No.**	4	6,9					**33.33**
	Marks	2	18				**20**	
Understand (L2)	**Q. No.**	1,7,8	5					**60.00**
	Marks	34	2				**36**	
Apply (L3)	**Q. No.**	3						**3.33**
	Marks	2					**2**	
Analyze (L4)	**Q. No.**	2						**3.33**
	Marks	2					**2**	
Total Marks		**40**	**20**				**60**	**100**