Course Code: 1940116 **Roll No:** **MLRS-R19**

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
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II B.Tech II Sem Supply End Examination, July 2022

Strength of Materials - II

(CIVIL)

Time: 3 Hours. **Max. Marks: 70**

Note: 1. Question paper consists: Part-A and Part-B.
2. In Part – A, answer all questions which carries 20 marks.
3. In Part – B, answer any one question from each unit.
Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

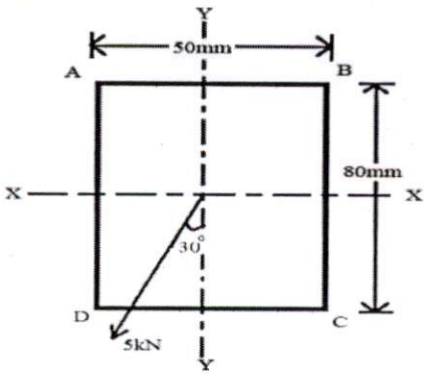
1.	a)	Write any two assumption in theory of torsion	2M	CO1	BL1
	b)	Which stress is in action when every section of shaft subjected to a twisting moment	2M	CO1	BL1
	c)	What do you meant by crippling load effect	2M	CO2	BL1
	d)	Write any two limitations of Euler's formula	2M	CO2	BL1
	e)	What is the difference between symmetrical and unsymmetrical bending?	2M	CO3	BL1
	f)	What do you mean by direct stress and bending stress?	2M	CO3	BL1
	g)	Calculate the bursting pressure for the cold steel tubing of 60mm internal diameter with 2mm wall thickness. The ultimate strength of steel is 380N/mm^2	2M	CO4	BL3
	h)	What stresses are developed in the pressure cylinders?	2M	CO4	BL1
	i)	Label the shear centre equation for unsymmetrical 'I' section.	2M	CO5	BL1
	j)	How will you calculate the distance of neutral axis from centroidal axis	2M	CO5	BL2

PART- B

(10*5 Marks = 50 Marks)

2	a)	What must be the length of a 5mm diameter Aluminum wire so that it can betwisted through one complete revolution without exceeding a shear stress of 42MN/m^2.Take C = 27 GN/m2	5M	CO1	BL3
	b)	Develop the torsion equation from fundamentals, with usual notations $\frac{T}{J} = \frac{q}{r} = \frac{C\theta}{L}$	5M	CO1	BL2
		OR			
3		When a circular shaft is subjected to torsion, show that the shear stress varies linearly from the axis to the surface?	10M	CO1	BL3

4	a)	A steel tube having 100mm outer diameter, 80mm inner diameter and 3.8mlong is used as a strut with both ends hinged. The load is parallel to the axis ofthe strut but is eccentric. Find the maximum value of eccentricity so thatcrippling load on strut is 60 percent of the Euler's crippling load	5M	CO2	BL4
	b)	What is the effective length of a column? How is the concept used in the column theory	5M	CO2	BL3
		OR			
5		How the columns are classified based on their nature of failure. Describe with neat sketches	10M	CO2	BL2
6	a)	Determine the maximum and minimum stresses induced when a when a column is subjected to eccentric loading	5M	CO3	BL3
	b)	Determine the stresses and deflection for the mid section of the I beam byunsymmetrical method	5M	CO3	BL3
		OR			
7		A column is rectangular in cross-section of 300mm×400mm in dimensions. The columncarries an eccentric point load of 360 KN on one diagonal at a distance of quarterdiagonal length from a corner. Determine the stresses at all four corners. Draw the stress distribution diagrams for any two adjacent sides.	10M	CO3	BL4
8	a)	Derive an expression for the radial and hoop stresses for a thick cylinder	5M	CO4	BL2
	b)	Derive an expression for the radial pressure and the loop stress for a thick spherical shell	5M	CO4	BL2
		OR			
9		A compound cylinder is made by shrinking a cylinder of 200 mm external diameter and160mm internal diameter over another cylinder of 160 mm external diameter and20 mm internal diameter. The radial pressure at the junction after shrinking on is 8N/mm². Estimate the final stresses setup across the section when the compound cylinderis subjected to an internal fluid pressure of 60N/mm²	10M	CO4	BL4
10	a)	Determine the stresses and deflection for the mid section of the L beam byunsymmetrical method. Also determine the position of the neutral axis.	5M	CO5	BL2
	b)	Explain the stresses induced due to unsymmetrical bending	5M	CO5	BL3
		OR			
11		A rectangular-section beam 80 mm × 50 mm is arranged as a cantilever 1.3 m long andloaded at its free end with a load of 5 kN inclined at an angle of 30⁰ to the vertical shown in Figure. Determine the position and magnitude of the greatest tensile stress inthe section. Take E = 210 GN/m²	10M	CO5	BL4



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