MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

MLRS

II B.Tech I Sem Supplementary Examination, July-2022
Mechanics of Solids
(MECHANICAL)

Time: 3 Hours.   Max. Marks: 70

Note: 1. Answer any FIVE questions.
      2. Each question carries 14 marks and may have a, b as sub questions.

1	a)	Define the terms : Poisson's ratio, Factor of Safety and Lateral strain	7M	CO1	BL1
	b)	A circular steel Bar of 20 mm diameter carries a tensile load of 3 kN . Find the tensile stress in the bar and the elongation in a length of 300 mm. Take E= 2 x 10^5 N/mm^2.	7M	CO1	BL3
2		Derive all the relations between the Elastic constants E, N, and K .	14M	CO1	BL3
3	a)	Define the shear force and bending moment? List out the types of loads acting on the beam?	7M	CO2	BL 1
	b)	Define the Beam and and describe the types of beams ?	7M	CO2	BL1
4		A simply supported beam AB of 4 m span carries a uniform load of 30kN /m over the right hand half span. Draw SFD and BMD ?	14M	CO2	BL3
5	a)	Define the section modulus ? write the equations for rectangular and circular sections?	7M	CO3	BL1
	b)	Write the assumptions made in derivation of bending equation?	7M	CO3	BL1
6		A cast iron has an I – section with top flange 80 mm x 40 mm. web 120 mm x 20 mm and bottom flange 160 mm x 40 mm . If tensile stress is not to exceed 30 N/mm^2 and compressive stress 90 N/mm^2, what is the maximum UDL the beam can carry over a simply supported span of 6 m if the larger flange is in tension.	14M	CO3	BL4
7	a)	Explain the meaning of principal stress .	7M	CO4	BL2
	b)	Draw and describe the Mohr's circle of stress?	7M	CO4	BL2
8		Derive the torsion equation $T/J = q/r = G\theta /L$? List out the assumptions made?	14M	CO5	BL4

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