Final:- 27.10.2021

Course Code: 1930113 **Roll No:** **MLRS- R19**

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

II B.Tech I Sem Supply End Examination, October 2021

STRENGTH OF MATERIALS – I

(CIVIL)

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.

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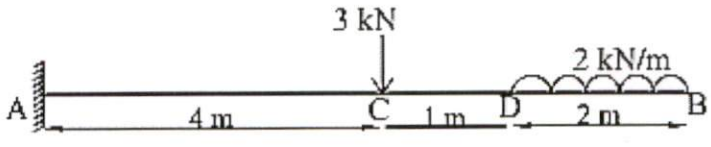
1	a)	Derive the relations between Young's Modulus and Rigidity Modulus	7M	CO1	BL5
	b)	Explain stress-strain curve for mild steel rod.	7M	CO1	BL4
2	a)	A load of 1.8 MN is applied on a short concrete column 450mm x 450mm, the column is reinforced with 4 steel bars of 10mm diameter, one in each corner. Find the stresses in the concrete and steel bars. Take E for steel as 2.1×10^5 N/mm^2 and for concrete as 1.4×10^5 N/mm^2 .	7M	CO1	BL3
	b)	A steel rod 40 mm in diameter is 2.5 m long. Find the maximum instantaneous stress induced when a pull of 80kN is applied (i) Gradually (ii) Suddenly and (iii) Find max. instantaneous Elongation. Take E = 105 GPa.	7M	CO1	BL3
3	a)	Explain Different types of loads acting on a beam with neat sketches.	7M	CO2	BL4
	b)	Draw SFD and BMD for cantilever beam shown in figure.	7M	CO2	BL2



4	a)	Explainthe following terms 1.Point of contraflexure 2.Pure Bending 3. Hogging moment and Sagging moment 4.Point of inflection.	7M	CO2	BL4
	b)	Derive section modulus for various cross section.	7M	CO3	BL6
5	a)	Explain Theory of simple bending.	7M	CO3	BL4
	b)	A beam of I-section has top flange 125mm x 16mm, bottom flange 150mm x 20mm and web thickness 12mm. The total depth of the beam is 250mm and simply supported over a span of 5m. The beam is subjected to UDL of 50kN/m over its entire span in addition to a concentrated load of 60kN at its midspan. Draw the bending stress distribution across the depth of the beam cross section at a section located 3m from the left support.	7M	CO3	BL3

6	a)	Derive deflection of Simply supported beam carrying a point load at centre.	7M	CO4	BL6
	b)	Derive slope and deflection of S.S beam subjected to point load at centre using Moment Area method.	7M	CO4	BL6
7	a)	A beam 4m long, simply supported at its ends, carries a point load W at its centre. If the slope of the ends of the beam is not to exceed 1 degree find the deflection at the centre of the beam.	7M	CO4	BL3
	b)	A rectangular bar of cross sectional area 10000mm^2 is subjected to an axial load of 20kN. Determine the normal and shear stresses on a section which is inclined at an angle of 30 deg with normal cross section of the bar.	7M	CO5	BL3
8	a)	The tensile stresses at a point across two mutually perpendicular planes are 120 N/mm^2 and 60 N/mm^2. Determine the normal, tangential and resultant stresses on a plane inclined at 30 degree to the axis of the minor stress, using Mohr's circle method.	7M	CO5	BL5
	b)	Derive slope of S.S beam with an u.d.l.using Mohr's theorem	7M	CO5	BL6