Q.P. Code: 20CE0164 **R20**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Regular Examinations May-2022

MECHANICS OF SOLIDS

(Common to ME & AGE)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		A body is subjected to direct stresses in two mutually perpendicular directions accompanied by a simple shear stress. Draw the Mohr's circle of stresses and explain how you will obtain the principal stresses and principal planes.	L2	12M

OR

2	a	Define stress and strain and explain their types.	L1	6M
	b	Draw and explain Stress-strain curve for a mild steel bar.	L1	6M

UNIT-II

3		A cantilever beam of length 3 m carries a uniformly distributed load of 1.5 KN/M runs over a length of 2 m from the free end. Draw SFD and BMD for the beam.	L3	12M

OR

4		Draw the shear force and bending moment diagram for a simply supported beam of length 9 m and carrying a uniformly distributed load of 10 KN/M For a distance of 6 m from the left end. Also calculate the maximum Bending moment in the section.	L3	12M

UNIT-III

5	a	Derive shear stress distribution formula for rectangular section with a Neat sketch.	L1	6M
	b	Derive shear stress distribution formula for circular section with a neat Sketch.	L1	6M

OR

6		Draw the shear stress distribution across: (i) Rectangular section. (ii) Triangular section. (iii) Circular section. (iv) I & T Sections	L1	12M

UNIT-IV

7		Derive the relation between slope, deflection and radius of curvature.	L2	12M

OR

8		Determine: (i) slope at the left support, (ii) Deflection under the load and (iii) Maximum deflection of a simply supported beam of length 5 m, which is carrying a point load of 5 KN at a distance of 3 m from the left end. Take E = 2 x 105 N/mm2 and I =1 x 10^8 mm^4.	L3	12M

UNIT-V

9	a	Derive expression for circumferential stress in thin cylinder.	L2	6M
	b	A cylindrical pipe of diameter 1.5m and thickness 1.5cm is subjected to an internal fluid pressure of 1.2 N/mm2. Determine: i) Longitudinal stress developed in the pipe, ii) Circumferential stress developed in the pipe.	L3	6M

OR

10		Derive an expression for hoop and radial stresses across thickness of the thick cylinder.	L2	12M

*** END ***