Q.P. Code: 18CE0111 **R18**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Regular Examinations October-2020

MECHANICS OF SOLIDS

(Civil Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1	**a**	Define thick and thin cylinders.	**2M**
	b	Define retaining walls.	**2M**
	c	Define Maxwell's Bellis theorem.	**2M**
	d	Define point of contraflexure.	**2M**
	e	Define distribution factor.	**2M**

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2 A cylindrical thin drum 80 cm in diameter and 3 m long has a shell thickness of 1cm. If the drum is subjected to an internal pressure of 2.5 N/mm^2. Determine (i) change in diameter, (ii) change in length and (iii) change in volume. Take E= $2x10^5$ N/mm^2 Poisson's ratio 0.25. **10M**

OR

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

UNIT-II

4 Derive kernel of section for Rectangular, Circular and Hallow Circular sections. **10M**

OR

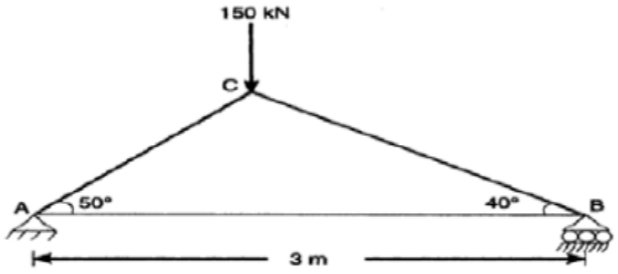
5 Find the position of centroid I_{XX} and I_{YY} for an unequal angle section 125mmX75mmX10mm. **10M**

UNIT-III

6 Calculate the central deflection and slope at ends of a simply supported beam carrying a U.D.L. w per unit length over the whole span. **10M**

OR

7 Determine the horizontal and vertical deflection components of joint C of the truss shown infigure below by energy method. Take E = 200 GPa and cross sectional area of each member is $1500X10^{-6}$ m^2. **10M**



UNIT-IV

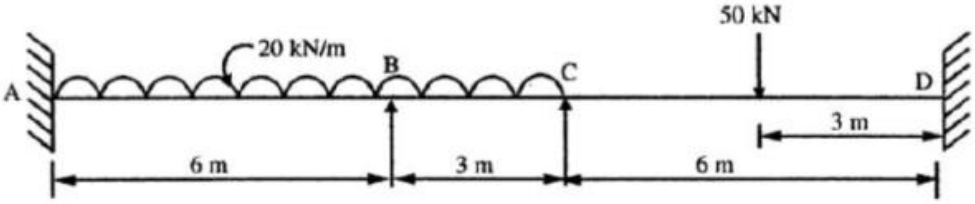
8 A Fixed beam of span 6 m is subjected a UDL of 5 kN/m on the left half of the span and a point load of 15 kN at the middle of the right half of the span. Draw the SFD and BMD. **10M**

OR

9 Derive an expression to find BM and SF of fixed beam carrying an eccentric load. **10M**

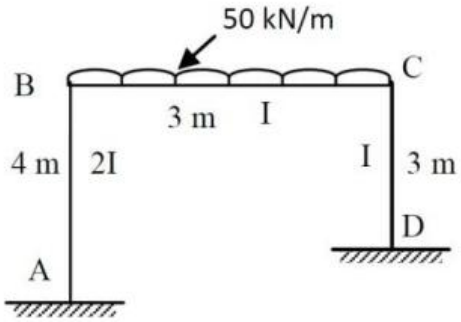
UNIT-V

10 Analyze the continuous beam as shown in figure below by slope deflection method. Support B sinks by 10 mm. Take E=200 GPa and I=16X10^7 mm^4. Draw the bending moment diagram. **10M**



OR

11 Analyze the portal frame shown in figure using moment distribution method. **10M**



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