Q.P. Code: 16CE104 **R16**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Regular & Supplementary Examinations Nov/Dec 2018

STRENGTH OF MATERIALS

(ME,AGE)

Time: 3 hours Max. Marks: 60

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

UNIT-I

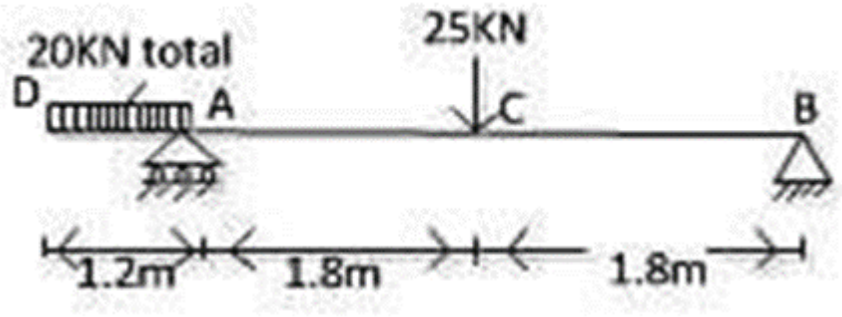
1 A steel rod of 2.5 cm diameter is enclosed centrally in a hollow copper tube of external diameter 6 cm and internal diameter of 3cm. the composite bar is then subjected to an axial pull of 50000N. If the length of each bar is equal to 20 cm, determine:
i) The stresses in the rod and tube, and (ii) Load carried by each bar. 12M

OR

2 Derive the relation between Young's Modulus (E), Rigidity Modulus (G) and Bulk Modulus (K) 12M

UNIT-II

3 Draw the shear force and bending moment diagrams for the beam shown in the figure .



12M

OR

4 A cantilever of length 3 m carries a uniformly distributed load of 2.5 kN/m length over the whole length and a point load of 3.5 kN at the free end. Draw SFD and BMD for the cantilever. 12M

UNIT-III

5 A simply supported beam carries a uniformly distributed load of intensity 30 N/mm over the entire span of 2 m. The cross section of beam is a T-section having flange 125 x 25 mm and web 175 x 25 mm. Calculate the maximum shear stress for the section subjected to maximum shear force. Also draw the shear stress distribution. 12M

OR

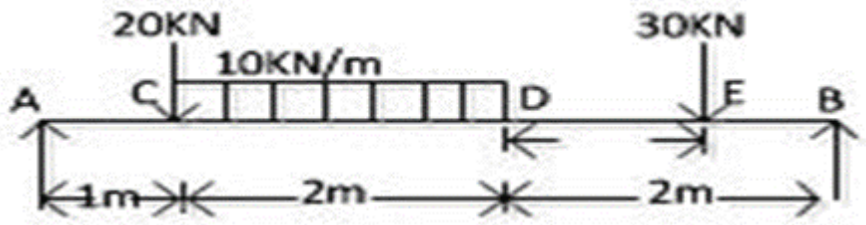
6 A steel beam of I –section, 200 mm deep and 160 mm wide has 16 mm thick flanges and 10 m thick web. The beam is subjected to a shear force of 200 kN. Determine the shear stress distribution over the beam section. 12M

UNIT-IV

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

OR

8 Determine the deflections at points C, D and E in the beam shown in the figure. Take E=200 kN/mm^2 and I=60 x10^6 mm^4.



12M

UNIT-V

9 Derive an expression for wire winding of thin cylinder. 12M

OR

10 A compound tube is composed of a tube 250 mm internal diameter and 25 mm thick shrunk on a tube of 250 mm external diameter and 25 mm thick. The radial pressure at the junction is 8 N/mm^2. The compound tube is subjected to an internal pressure of 84.5 N/mm^2. Find the variation of the hoop stress over the wall of the compound tube. 12M

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