ROLL No: [   ]

Total number of pages:[2]
Total number of questions:06

M/18
2011 Batch onwards

B.Tech. || CE || 3rdSem
Strength of Material
Subject Code:BTCE-301A/303   Reappear
Paper ID:

Time allowed: 3 Hrs

Max Marks: 60

Important Instructions:

* All questions are compulsory
* Assume any missing data

PART A (2×10)

Q. 1.   Short-Answer Questions:
(a) What is Strain? Write its types.
(b) What are the various types of Column?
(c) What is Point of Inflexion?
(d) Write down Flexural Formula for beams.
(e) What is Modulus of Rigidity?
(f) Define Torsional Flexibility and Torsional Rigidity.
(g) Define Normal stress and Tangential stress?
(h) What is Difference between Hoop stress and Longitudinal stress?
(i) State perpendicular axis Theorem of M.O.I.
(j) List the various theories of elastic failure.

PART B (8×5)

Q. 2   What do you understand by Stress? Define Hook's law and draw Stress-Strain diagram for the Ductile material and explain all the stages in detail.

CO1

OR

A cylindrical thin drum 800 mm in diameter and 2 m long has a shell thickness of 10 mm. If drum is subjected to internal pressure 10 N/mm^2 .Determine (i) Change in diameter (ii) Change in length (iii) Change in volume. Take E= 200 GPa and Poisson's ratio=0.30.

CO1

Q. 3.   Determine the values of normal, tangential and resultant stresses when a member is subjected to unequal and like normal stresses in two mutually perpendicular directions.

CO2

OR

At a certain point in a strained material, the principal tensile stresses across two perpendicular planes are 200 N/mm^2 and 100 N/mm^2. Determine normal stress, shear and resultant stresses on plane inclined at 35^0 with the major principal plane. Also determine the Obliquity. What will be intensity of stress which acting alone will produce the same max. strain if Poisson's ratio=0.33.
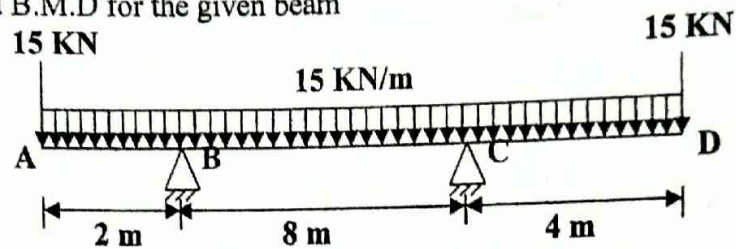
CO2

Q. 4. Draw S.F.D and B.M.D for the given Simply Supported Beam

15KN/m

16 KN/m   18KN

A   B   C   D   E

4 m   1 m   6 m

12 m
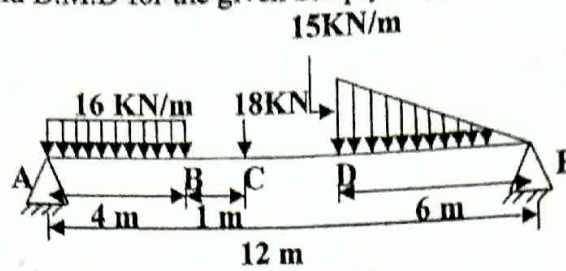
CO3

OR

Draw S.F.D and B.M.D for the given beam

15 KN   15 KN

15 KN/m

A   B   C   D

2 m   8 m   4 m

CO3

Q. 5. A flitched beam consists of wooden joist 150mm wide and 300mm deep strengthened by a steel plates 12mm thick and 300mm deep one on either side of joist. If the maximum stress in wooden joist is 7 KN/mm^2.Find the corresponding maximum stress attained in steel. Find also the moment of resistance of section. Take $E_s= 20\ E_w$.

CO4

OR

Find M.O.I about centroidal axis XX and YY of the given section

50 mm

15 mm

100 mm   20 mm

25 mm

150 mm
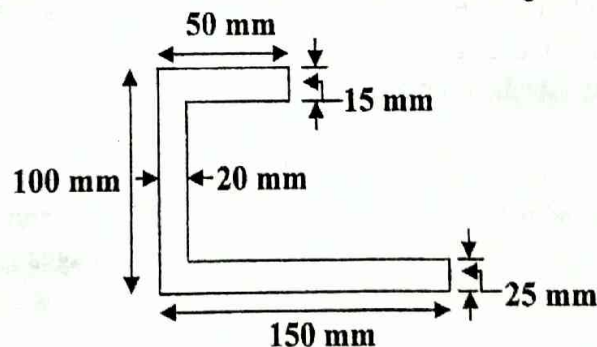
CO4

Q. 6. A column 5 m long is 90 mm in diameter. Find the safe compressive load for the member using Euler's formula when (i) One end of column is fixed while another end is hinged (ii) Both ends of column are fixed (iii) Both end are pinned (iv) One end is fixed and other is free . If factor of safety is 3. Take E= 200 GPa.

CO5

OR

What are the assumptions in the theory of pure torsion. Write the pure torsion equation.

CO6