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5570

Register Number:

Name of the Candidate:

B.Sc. DEGREE EXAMINATION December 2014

(CONSTRUCTION MANAGEMENT)

(THIRD SEMESTER)

320: STRENGTH OF MATERIALS-I

Time: Three hours

Maximum: 75 marks

Answer ONE FULL question from each UNIT

(5 × 15 = 75)

UNIT-I

1. a) Define young's modulus. (3)
b) A steel rod 25mm in diameter and 2m long is subjected to an axial pull of 50kN. Find (i) the intensity of stress (ii) Elongation. Take $E=2 \times 10^5 \text{N/mm}^2$ (12)

(OR)

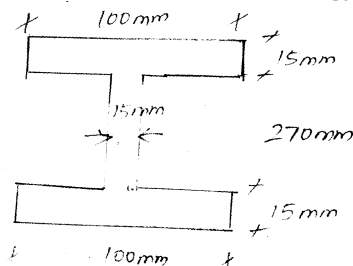
2. a) State Hook's law and Elastic limit. (3)
b) A square R.C.C column 300mm size is reinforced with 4 nos of 25mm diameter bars. The permissible compressive stress in concrete is 5N/mm^2 modular ratio of steel and concrete is 13.3. Determine the maximum allowable load on the column. (12)

UNIT-II

3. a) Define radius of gyration. (3)
b) Find the moment of inertia for a channel section $300\text{mm} \times 150\text{mm} \times 20\text{mm}$ about it centroidal axis. (12)

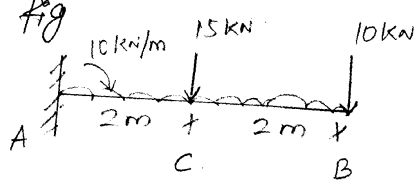
(OR)

4. a) State parallel axis theorem. (3)
b) Find the I_{xx} and I_{yy} for a given I section, also determine the section modulus and radius of gyration about the centroidal axis. (12)



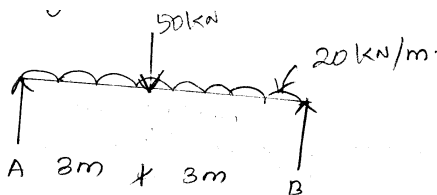
UNIT-III

5. a) What are the different types of loads? (3)
 b) Draw the SFD and BMD for the beam shown in figure: (12)



(OR)

6. a) What is shear stress? (3)
 b) Draw the SFD and BMD for the beam show in fig. (12)



UNIT-IV

7. a) What are the assumptions made in theory of simple bending? (5)
 b) A simply supported beam 5m long carries an UdL of 20kN/m if the bending stress is not exceed 12N/mm². Determine the depth of rectangular section. Take b=200mm. (10)

(OR)

8. a) What is the relation between slope, deflection and radius of curvature of a simply supported beam? (5)
 b) A simply supported beam AB of span 5 meters is carrying a point load of 30kN at a distance 3.75m from the left end A. Calculate the slopes at A and B and deflection under the load. Take $EI=26 \times 10^{12} \text{N}\cdot\text{mm}^2$ (Use moment area method) (10)

UNIT-V

9. a) What is circumferential stress? (3)
 b) A spherical shell of 2m diameter is made up of 10mm thick plates. Calculate the change in diameter and volume of the shell, when it is subjected to an internal pressure of 1.6Mpa. Take $E=200\text{Gpa}$ and $\nu=0.3$ (12)

(OR)

10. a) What is difference between a thin cylindrical shell and a thick cylindrical shell? (3)
 b) A compound cylinder is made by shrinking a tube of 160mm internal diameter and 20mm thick over another tube of 160mm external diameter and 20mm thick. The radial pressure at the common surface, after shrinking is 8N/mm². Find the final stresses setup across the section, when the compound cylinder is subjected to an internal fluid pressure of 60N/mm² (12)
