CBCS SCHEME

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18ENG25

Second Semester B.Arch. Degree Examination, Dec.2019/Jan.2020
Building Structures – II

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Explain different types of stresses and strain with neat sketches. **(10 Marks)**

b. Explain stress-strain curve for Mild Steel. **(10 Marks)**

OR

2 a. Write brief notes on Poisson's ratio, Elastic constants, Temperature stresses. **(10 Marks)**

b. A brass bar having cross section area of 1000 mm^2 is subjected to axial forces as shown in Fig.Q2(a). Calculate the force 'P' necessary for equilibrium of bar. Determine the total Elongation of the bar. Take $E = 1.05 * 10^5$ N/mm^2.

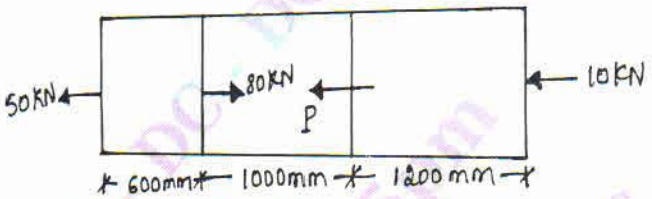

Fig.Q2(a) **(10 Marks)**

Module-2

3 a. Explain the following:
(i) Bending Moment Diagram (BMD)
(ii) Shear Force Diagram (SFD)
(iii)Sign convention followed to represent BMD and SFD
(iv)Point of contraflexure **(10 Marks)**

b. Draw SFD and BMD for cantilever beam shown in the Fig.Q3(b).

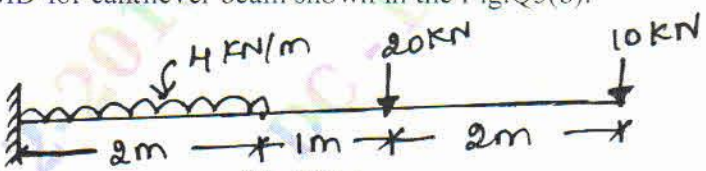

Fig.Q3(b) **(10 Marks)**

OR

4 Draw BMD and SFD for overhanging beam shown in Fig.Q4. Clearly indicate point of contraflexure.

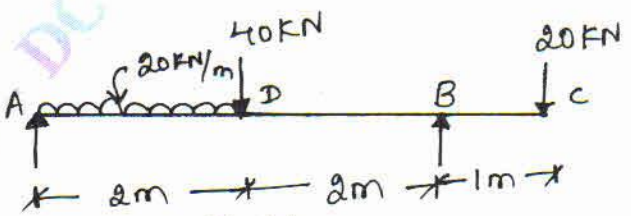

Fig.Q4 **(20 Marks)**

Module-3

5 a. What are the assumptions made in bending theory and explain bending equation? **(10 Marks)**

b. A beam with cross section shown in Fig.Q5(b) is simply supported and carries a maximum bending moment of 16 kN-m. Calculate maximum compressive and tensile stress.

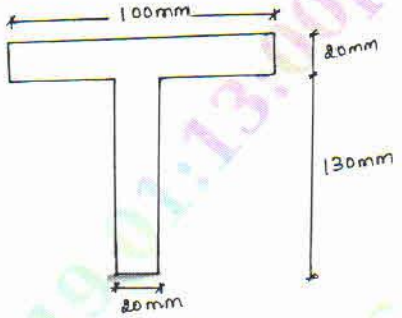

Fig.Q5(b) **(10 Marks)**

OR

6 The unsymmetrical I-section shown in Fig.Q6 is subjected to a shear force of 40 kN. Draw the shear stress variation diagram across the depth.

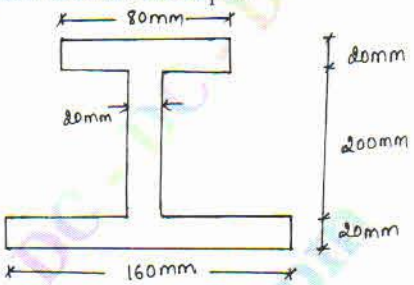

Fig.Q6 **(20 Marks)**

Module-4

7 a. Write expression for effective length of columns for various end conditions. **(10 Marks)**

b. Explain Euler's formula for long columns. What are the assumptions and limitations of Euler's theory for critical load on long column? **(10 Marks)**

OR

8 a. Write the expressions for section modulus of:
(i) Hollow rectangular section with symmetrically placed opening
(ii) Triangular section
(iii)Rectangular section **(10 Marks)**

b. Determine the Euler's crippling load for an I-section column 400 × 200 × 10 mm having length of 5m which is used as a strut with both ends fixed. Take $E = 2.1 \times 10^5$ N/mm^2. **(10 Marks)**

Module-5

9 Explain moment curvature equation. Determine a simply supported beam subjected to a central concentrated load. **(20 Marks)**

OR

10 A simply supported beam of 6m span subjected to a concentrated load of 18 kN at 4m from left support. Calculate:
(i) The position and value of maximum deflection
(ii) Slope at mid-span
(iii) Deflection at the load point
by Macaulay's method. Take E = 200 GPa and $I = 15 \times 10^6$ mm^4. **(20 Marks)**

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