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14ENG2.5

Second Semester B.Arch. Degree Examination, June/July 2016
Building Structures – II

Time: 3 hrs. Max. Marks:100

Note: ***1. Answer any FIVE full questions, selecting ONE full questions from each part.***
2. Missing data, if any, may be suitably assumed.

PART – A

1 a. State Parallel axis theorem. **(05 Marks)**

b. Determine the moment of inertia of the symmetric I section shown in Fig. 1(b) about its centriodal axes x – x and y – y. **(15 Marks)**

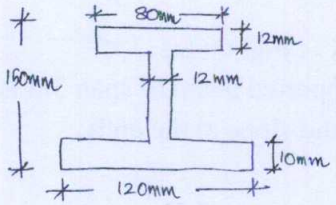

Fig. Q1(b)

2 a. Explain : i) Types of support ii) Types of load. **(10 Marks)**

b. Determine the support reaction of the beam shown in Fig. Q2(b). **(10 Marks)**

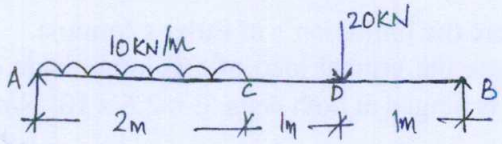

Fig. Q2(b)

PART – B

3 a. Draw BMD and SFD for the cantilever beam shown in Fig. Q3(a). **(10 Marks)**

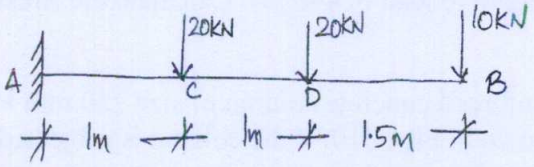

Fig. Q3(a)

b. Draw SFD and BMD for overhanging beam shown in Fig. Q3(b). **(10 Marks)**

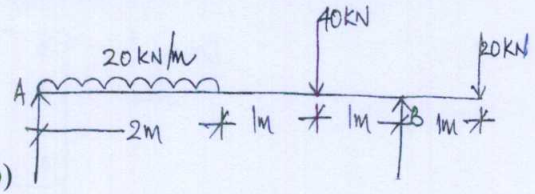

Fig. Q3(b)

4 Calculate the section modulus for the following :

a. Rectangular section of size 300 mm × 200 mm. **(05 Marks)**

b. A circular pipe of external diameter 100 mm and thickness 10 mm. **(05 Marks)**

c. Draw shear stress distribution across the depth. **(10 Marks)**

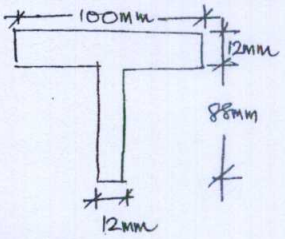

Fig. 4(c)(i)

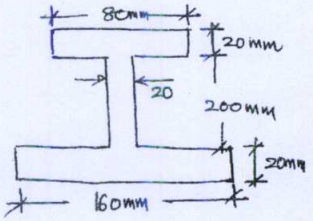

Fig. Q4(c)(ii)

PART – C

5 A circular pipe of external diameter 70 mm and inkiness 8mm is used as a simply supported beam over an effective span 2.5 m. Find the maximum concentrated load that can be applied at the centre of the span if permissible stress in tube is 150 N/mm^2. **(20 Marks)**

6 a. Find the deflection of free end of cantilever beam shown in Fig. Q6(a). Take E = 2 × 10^{5}N/mm^2 ; I = 180 × 10^6 mm^4. **(10 Marks)**

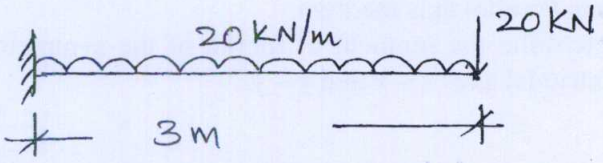

Fig. Q6(a)

b. A simply supported beam of span 3m is subjected to a udℓ of 50 kN/m. Find the deflection at centre span and slope at the ends. **(10 Marks)**

PART – D

7 a. Write short note on short column and long column. **(08 Marks)**

b. Write Euler's crippling load for different end conditions of a column. **(12 Marks)**

8 a. What are the limitation's of Euler's formula. **(08 Marks)**

b. Calculate the critical load of a column made of a bar, circular in section and 5m long and which is hinged at both ends. E = 2.6 × 10^9 N/mm^2. **(12 Marks)**

PART – E

9 A 300 mm × 300 mm RC member reinforced with 1257 mm^2 of steel supports an axial compressive load of 440 kN. Calculate the stresses in concrete and steel. Take m = 13.33. **(20 Marks)**

10 A reinforced concrete column of size 230 mm × 400 mm has 8 steel bars of 12 mm diameter as shown in Fig .Q10. If the column is subjected to an axial compression of 600 kN. Find the stresses developed in steel and concrete. **(20 Marks)**

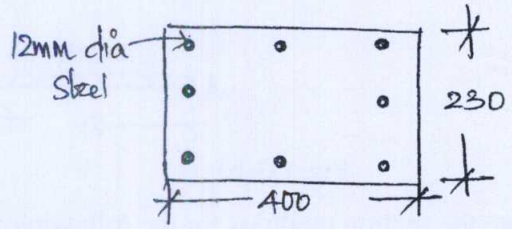

Fig. Q10

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