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14ENG2.5

Second Semester B.Arch. Degree Examination, June/July 2017
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. Differentiate between centroid and centre of gravity. **(06 Marks)**

b. Locate the centroid of the area shown in Fig Q 1(b). **(14 Marks)**

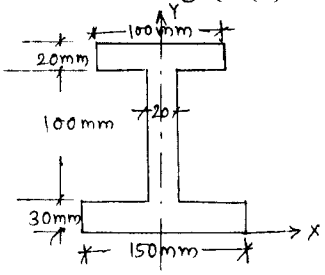

Fig Q1(b)

2 a. State and explain parallel axis theorem. **(08 Marks)**

b. Calculate moment of Inertia and Polar moment of Inertia for the given Fig Q2(b). **(12 Marks)**

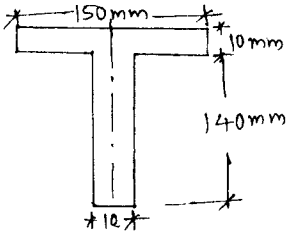

Fig Q2(b)

Module – 2

3 Draw SFD and BMD for the beam shown in Fig Q3 Indicate the salient points. **(20 Marks)**

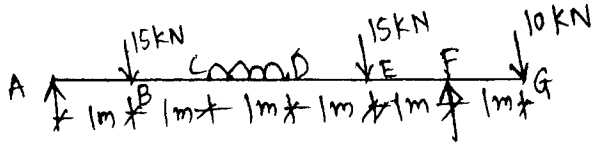

Fig Q3

4 a. Draw SFD and BMD for the cantilever beam shown in Fig Q4(a). **(10 Marks)**

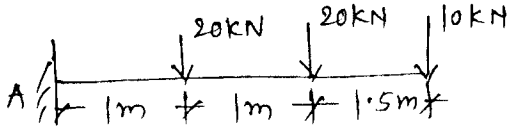

Fig Q4(a)

b. Draw SFD and BMD for the beam shown in Fig Q4(b). **(10 Marks)**

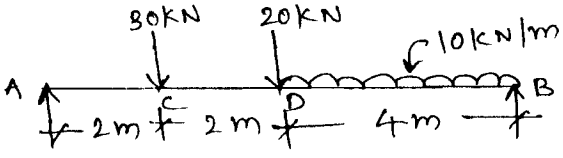

Fig Q4(b)

Module – 3

5 a. Find out the section modulus for i) Rectangular section ii) Hollow rectangular section iii) Circular section iv) Hollow circular section. **(08 Marks)**

b. A simply supported beam of span 5m has a C/S 150mm×250mm. If the permissible stress is 10N/mm^2 , find maximum intensity of udl it can carry. **(12 Marks)**

6 a. Find the deflection at free end in the cantilever beam shown in Fig Q6(a). **(10 Marks)**

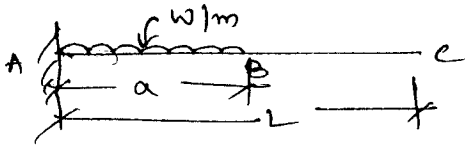

Fig Q6(a)

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

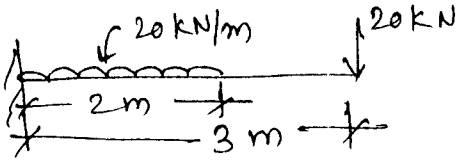

Fig Q6(b)

Module – 4

7 a. Write the Euler's formula for different end conditions of column. **(10 Marks)**

b. Calculate the crippling load for a solid round bar of 5m long and 60mm diameter is used as a strut with the following conditions. Take E = 2×10^5 N/mm^2.
i) Both ends hinged ii) One end fixed and other end free iii) Both the ends fixed. **(10 Marks)**

8 a. Define : i) Column ii) Effective length iii) Slenderness ratio iv) Critical load. **(06 Marks)**

b. A mild steel tube 5m long, 30mm internal dia and 6mm wall thickness, used as strut with fixed ends. Calculate the critical load using Euler's formula E = 2.10 × 10^5 N/mm^2. **(14 Marks)**

Module – 5

9 Calculate the maximum load that can be carried by a concrete column of size 230mm×400mm has 8 bars of 12mm diameter. Take M.20 and Fe-415 grade of concrete and steel respectively. **(20 Marks)**

10 A reinforced concrete column of circular section is of dia. 300mm. Determine the strength of the column it i) 6 vertical bars of 16mm dia and ii) 6 vertical bars of 20mm dia. Are used Take f_{ck} = 20N/mm^2 and f_y = 415 N/mm^2. **(20 Marks)**

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