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14ENG25

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, selecting at least ONE questions from each part.***

Module – I

1 a. Define centre of gravity and centroid. **(04 Marks)**

b. Determine the location of the centroid, shown in Fig Q1(b) **(16 Marks)**

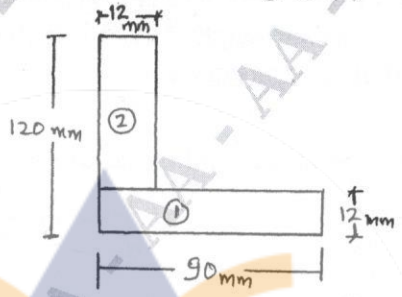

Fig. Q 1(b)

OR

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)**

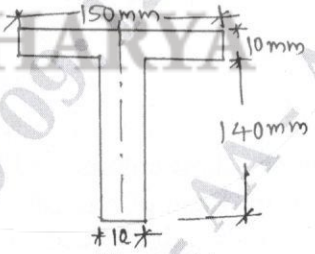

Fig Q2(b)

Module – II

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

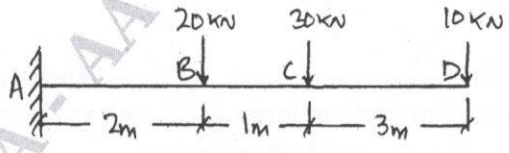

Fig.Q3(a)

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

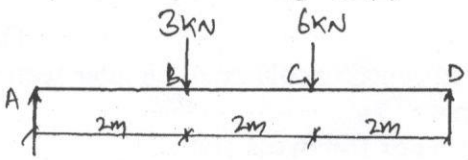

Fig. Q3(b)

OR

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

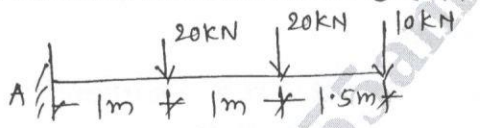

Fig Q4(a)

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

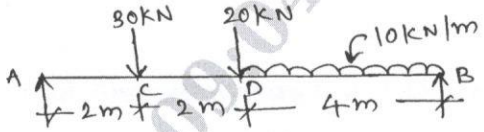

Fig Q4(b)

Module – III

5 a. List out the assumptions made in theory of simple bending. **(04 Marks)**

b. Calculate maximum stress induced in a steel pipe of external diameter 40mm and internal diameter 20mm and of length 4m. When the pipe is simply supported at its ends and carries a point load of 80N at its centre. **(16 Marks)**

OR

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

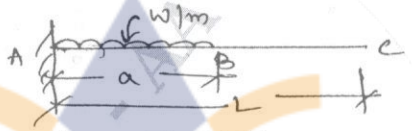

Fig Q6(a)

b. Find the displacement of cantilever beam of free end shown in Fig Q6(b). Take $E = 2\times10^5$ N/mm^2, $I = 180\times10^6$ mm^4. **(10 Marks)**

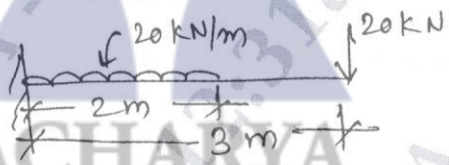

Fig Q6(b)

Module – IV

7 a. Differentiate between short column and long column. **(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. $E = 2.10\times10^5$ N/mm^2. **(14 Marks)**

OR

8 a. Differentiate between "Length of a column" and "Effective length of a column" **(08 Marks)**

b. Calculate the 'Effective length' of a column of Length 8000mm for different standard end conditions. **(12 Marks)**

Module –V

9 A reinforced concrete column is of section 300mm × 300mm. Determine the strength of the column if : i) 6 vertical bars at 16mm dia ii) 6 vertical bars of 20mm dia are used. Take $f_{ck} = 20$N/mm^2 ; $f_y = 415$ N/mm^2. **(20 Marks)**

OR

10 A reinforced concrete column of circular section is of dia. 300mm. Determine the strength of the column it :

a. 6 vertical bars of 16mm dia and

b. 6 vertical bars of 20mm dia. are used Take $f_{ck} = 20$N/mm^2 and $f_y = 415$ N/mm^2. **(20 Marks)**