CBCS SCHEME

USN | | | | | | | | | | |

15ENG25

Second Semester B.Arch. Degree Examination, July/August 2022
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. Define centre of gravity and centroid. **(04 Marks)**

b. Determine the location of the centroid shown in Fig.Q1(b).

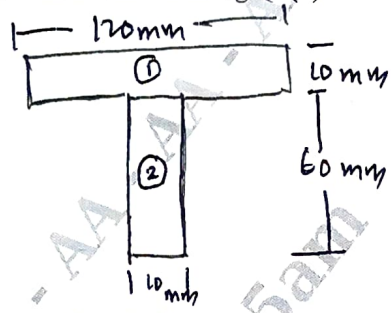

Fig.Q1(b) **(16 Marks)**

OR

2 a. State parallel axis theorem and explain in brief. **(04 Marks)**

b. Determine the centroid of the Fig. Q2 (b).

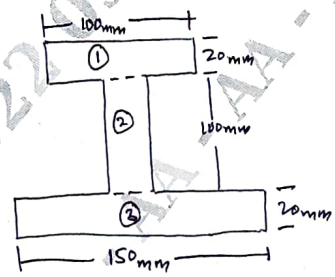

Fig.Q2(b) **(16Marks)**

Module-2

3 a. Define i) Bending moment ii) Shear force and explain sign conventions. **(06 Marks)**

b. Draw shear force diagram (SFD) and bending moment diagram (BMD) for given beam in Fig.Q3(b).

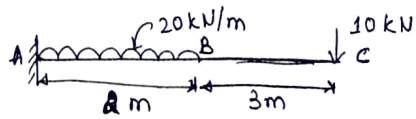

Fig.Q3(b) **(14 Marks)**

OR

4 Draw shear force diagram and bending moment diagram for given beam Fig.Q4.

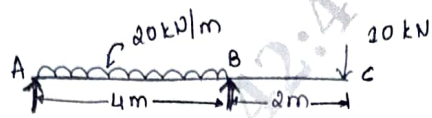

Fig.Q4 **(20 Marks)**

Module-3

5 a. What are the assumption made in simple theory of bending? **(06 Marks)**

b. A simply supported beam of span 5m has a cross section 150mm × 250mm if the permissible stress is 10N/mm^2 Find :

i) Maximum intensity of uniformly distributed load it can carry

ii) Maximum concentrated load P applied at 2m from one end it can carry. **(14 Marks)**

OR

6 a. Provide the expression for finding out section modulus for :

i) Rectangular section

ii) Hallow rectangular section

iii) Circular section

iv) Hollow circular section. **(04 Marks)**

b. A circular pipe of external diameter 70mm and thickness 8mm is used as a simply supported beam over an effective span 2.5m. Find the maximum concentrated load that can be applied at the centre of the span if permissible stress in tube is 150M/mm^2. **(16 Marks)**

Module-4

7 a. Differentiate between short and long columns. **(04 Marks)**

b. A hollow mild steel tube 6 m long 40 mm internal diameter and 50 mm external diameter is used as a shunt with both ends hinged. Find the crippling load and safe load taking factor of safety as 3.0 and E = 2 × 10^{5}N/mm^2. **(16 Marks)**

OR

8 a. Define : i) strut ii) Slenderness ratio iii) Buckling lond iv) safe load **(04 Marks)**

b. A solid rand bar 3 m long and 50 mm diameter is used as a strut. Determine the crippling load, when the given strut is used with the following conditions : E = 2 × 10^{5}N/mm^2.

i) Both ends hinged

ii) One end fixed and other is free

iii) Both ends are fixed

iv) One end fixed and other is hinged. **(16 Marks)**

Module-5

9 a. Define short column and long column according to IS 456:2000. **(04 Marks)**

b. Calculate ultimate load carried by a RCC column of size 500mm × 500mm and reinforced with 8 bars of 16 mm diameter. Grade of steel and concrete used are Fe415 and M20 respectively. **(16 Marks)**

OR

10 Calculate ultimate load carried by the circular column of diameter 300 mm and reinforced with 6 bars of 16 mm diameter. Grade of concrete and steel used are

i) M20 and Fe415

ii) M15 and Fe500. **(20 Marks)**

* * * * *