B.Arch.Fifth Semester (Architecture) (Old)

Structure - V : 5 SA 3

P. Pages : 1 | AU - 3121

Time : Three Hours | Max. Marks : 40

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Notes : 1. Assume suitable date wherever necessary.
2. Illustrate your answer necessary with the help of neat sketches.
3. I.S.I Hand book for structural Steel section, I.S. Code 800/1962 or 1964, I.S. 456 (Revised) I.S. 875 may be consulted.
4. Use of calculator is permitted.

1. a) Explain the significance of following terms: **5**
i) Slenderness ratio ii) Radius of gyration
iii) Buckling iv) Bending
v) Unsupported length and vi) Effective length.

b) Design a column section to carry an axial load of 410 kN. the column is 4..2 m long and is effectively held in position of both ends but restrained against rotation at one end only. Yield stress of steel = 250 MPa. **8**

OR

2. a) Write stability condition for retaining wall. **3**

b) A masonry retaining wall of trapezoidal section is 6 meters high and 1 meter wide at the top, retaining soil level with its top. Find the minimum width of the wall in order tension may not be induced at the base. Masonry and soil weigh 23000N and 16000N per cubic meter respectively. The angle of repose of the soil is 30° and the back face of the wall is vertical. **10**

3. a) Which factors will you consider while deciding the strength of concrete to be used for a given work? **3**

b) What is curing? How is it done? How does it influence the strength of concrete? **4**

c) What is workability and how is it measured in practice? **6**

OR

4. A simply supported rectangular beam of clear span 5m carries a uniformly distributed super imposed load of 22 kN/m. the beam section is 230mm × 700mm overall. Design the beam. The beam rests on 350mm thick brick walls running perpendicular to the axis of the beam. The materials are M_{15} grade concrete and HYSD reinforcement of grade Fe415. **13**

5. a) What do you mean by balanced section and undereinforced section. **4**

b) 300mm and 650mm deep beam section has been reinforced by 20mmϕ-6 nos rods in compressive zone. $\in$.G. of the tensile steel is 50 mm from bottom of the beam and that of compressive steel 40mm from top of the beam. If permissible values of 6cbc and 6st and are respectively 5N/mm^2 and 140 N/mm^2 and m = 18, calculate the moment of resistance of the beam section. **10**

OR

6. Design a R. C. C. roofing slab over an isolated 3m × 4m sized room. A superimposed load of 2860 N/m^2 is acting over the slab. The slab has also been provided with a 20mm thick finishing. Corners of the slab are free to lift to lift. Adopt 6cbc = 5 N/mm^2, 6st = 140N/mm^2 and m = 18. **14**

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