Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 10

B. Arch. (2012 & Onwards) (Sem.–4)

STRUCTURE DESIGN – III

Subject Code : BACH-409

M.Code : 71024

Time : 3 Hrs. **Max. Marks : 50**

INSTRUCTIONS TO CANDIDATES :

1. **Attempt five questions with one question from each UNIT, --all questions are of equal marks**
2. **Use of IS - 456, Scientific Calculator is allowed. Assume missing data if any. Draw neat diagrams.**

UNIT-I

1. A concrete beam section of 600 mm overall depth and 300mm width is simply supported having 6.0 meter span. Find moment of resistance of section.

   Assume M25 concrete, steel primary or secondary - Fe-500.

   End support conditions- simply supported. (10)

2. a) What do you understand by T beams and L beams? (5)

   b) What is shear reinforcement and where is it provided in beam, draw sketches? (5)

UNIT-II

3. Design two way concrete slab of 3500mm × 3500mm clear span, considering all sides continuous. Assume live load on floor 3Kn/m^2, Use M25 concrete strength and steel of min yield stress of 500n/mm^2. (10)

4. a) What maximum deflection in slab is allowed as per code? How will you check the defection in beams? (5)

   b) What is difference between continue slab and simply supported slab, show its behavior in bending moment, shear and deflection by drawing neat sketches. (5)

UNIT-III

5. Design a dog legged concrete stair case with 150mm riser and 300mm tread, total steps are 20 and landing is 1200mm. Take width of stair 1200mm. Assume live load as 4.0 Kn/m^2 Draw sketch. (10)

6. a) Describe various types of stairs. What is effective span of stair? (5)

   b) Draw a general section showing the reinforcement of stair case. (5)

UNIT-IV

7. a) What is interaction diagram in column design? (5)

   b) Explain slender and short columns. (5)

8. Design a square and equal face reinforcement concrete column, which can withstand a load of 1000 Kn along with moment of 100 Kn-m in one direction. Assume concrete strength M25 and steel reinforcement Fe- 500. Assume 40mm clear reinforcement cover. (10)

UNIT-V

9. a) What is one way and two way shear check in footings? (4)

   b) At what distance from column face, the two way shear is checked? (2)

   c) What is the difference between isolated and strap footing? Describe situations where these could use? (4)

10. Design independent square footing for 1000 Kn load, The column size is 450mm × 450mm. Assume net soil bearing capacity - 100 Kn /m^2 at 1.5 meter depth form natural ground level. Find spread area, depth of concrete in footing and reinforcement required. Assume concrete strength M20, Steel Fe-415, clear cover to reinforcement 50 mm. (10)

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.