24804282

**QP CODE: 24804282**

**Reg No** : .....

**Name** : .....

## B.ARCH DEGREE REGULAR/SUPPLEMENTARY EXAMINATIONS, AUGUST 2024

### Fourth Semester

BACHELOR OF ARCHITECTURE

### 19AR04005 - THEORY OF STRUCTURES 4

2019 Admission Onwards

EF46576D

Time: 3 Hours Max. Marks : 100

**Part A**

*Answer any six questions out of Eight.*

*Each question carries 5 marks.*

1. Plain Cement Concrete.
2. Write short note on ferrocement concrete.
3. When shall we select doubly reinforced beam over singly reinforced beam? Explain.
4. Explain the parts of a staircase with the help of a sketch.
5. Different types of loads acting on a stair.
6. Radial Grids.
7. Contributary area method.
8. Under what circumstances are pile foundations preferred?

(6×5=30)

**Part B**

*Answer any four questions out of six.*

*Each question carries 10 marks.*

9. Limit State of Serviceability .
10. Explan the stress strain block parameters of singly reinforced sections with neat sketches.
11. Distinguish through plan and cross section in drawing the arrangements 10 mm diameter rods at 150 mm c/c and 10 mm diameter main bars at 200 mm c/c in shorter span and

longer span of room size 4.8 m x 6.4 m. In the same room same reinforcement in case of two way slab corners not held down and corners held down separately.

12. Write the design procedure for a Flat slab.

13. Explain how one-way shear and two-way shear are considered in isolated footings.

14. Find its effective length if the column is effectively held in position and restrained against rotation at both ends of a column 400 mm x 400 mm has an unsupported length of 7 m. Prove whether the column can be designed as a short column under axial compression , if the load is placed centrally on it?

(4×10=40)

**Part C**

*Answer any two questions out of Four.*

*Each question carries 15 marks.*

15. Consider a typical reinforced concrete building in your institution.Identify the various structural elements in the structural systems of the building and briefly explain how the loads are transmitted to the supporting ground.

16. What is bond stress in reinforced concrete ? How do you calculate bond stress?

17. Design a slab for a room made up of masonry walls 230 mm thick on all the four sides. The slab is simply supported on these walls. Size of the room is 3.2 m x 10 m. The Floor finish load is 1 kN/$m^2$. Live load is 3 kN/$m^2$. Use M20 grade concrete and Fe 415 steel.

18. Design a square reinforced column to carry an axial load of 1200 kN including its self weight. The column is fixed at both ends and the clear height between the floor and soffit of the beam is 3 m . Use M20 grade concrete and Fe 415 HYSD bars.

(2×15=30)