Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   **Total No. of Pages : 02**

Total No. of Questions : 10

B. Architecture (Sem.–2)
STRUCTURE DESIGN – II
Subject Code : AR-138
M.Code : 45018

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

INSTRUCTIONS TO CANDIDATES :

1. **Attempt one question from each unit.**
2. **All question carry equal marks.**
3. **Use of I.S. code is permitted.**
4. **Assume missing data, if any.**
5. **Draw neat diagrams.**

SECTION-A

1. Design and sketch a footing for 1 brick thick wall 3m height, carrying a U.D.L. of 20 kN/m. Use traditional brick (230 mm × 115mm × 75mm). Safe bearing capacity (S.B.C.) of soil is 100 kN/m^2. Angle of repose of soil is 30°, soil density is 17 kN/m^3. Use P.C.C. (1 : 4 : 8) as foundation concrete. Density of brick masonry is 19kN/m^3. (10)

2. Design a footing for a square column of 300 mm × 300 mm, having a height of 3.5 m. The safe bearing capacity (S.B.C.) of soil is 100 kN/m^2. Angle of repose of soil is 30°, soil density is 18 kN/m^3. Use P.C.C. (1 : 4 : 8) as foundation concrete. Density of brick masonry is 19 kN/m^3. (10)

SECTION-B

3. A masonry retaining wall is 5m high with a vertical back. The backfill is horizontal with the top of the wall. The soil has an angle of repose of 30°. If the backfill has a density of 12kN/m^3, calculate the magnitude of active pressure per meter length of wall and its line of action. (10)

4. A masonry retaining wall is 4m high with a top width of 2m and base width of 3.5 m. The density of masonry is 21kN/m^3 and density of soil is 15 kN/m^3. Angle of repose of 30°. Find the maximum & minimum stress intensity. (10)

SECTION-C

5.   Design a brick column to carry an axial compressive load of 700 kN. The height of column is 3.5 m. Use conventional brick, cement sand mortar (1 : 4).   (10)

6.   Design a brick masonry wall using traditional brick to support an axial load of 100 kN/m. Height of brick wall is 3m and its length between cross wall is 4m.   (10)

SECTION-D

7.   Design a timber beam using Kali wood to carry a U.D.L. of 12kN/m over a span of 4m.   (10)

8.   Explain check for shear deflection & bearing.   (10)

SECTION-E

9.   Design a compressive member for a wooden roof truss to carry an axial compressive load of 65kN. The span of member is 2.5m. Use teak wood.   (10)

10. What are the uses of timber trusses? Explain any 5 shapes of roof trusses with neat diagram of each.   (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.