

Total No. of Pages : 02

Total No. of Questions : 08

B. Architecture (Sem.-2)

STRUCTURE DESIGN – II

Subject Code : AR-138

M.Code : 45018

Time : 3 Hrs.

Max. Marks : 50

INSTRUCTIONS TO CANDIDATES :

- 1. Question No. 1 is compulsory.**
- 2. Attempt FIVE Questions out of EIGHT Questions. All carry equal marks.**
- 3. Use of scientific calculator is allowed.**
- 4. Assume missing data if any.**
- 5. Draw neat diagrams.**

1.
 - a. Explain shear stress. (2)
 - b. What is effective depth of beam? (2)
 - c. What is section modulus? (2)
 - d. What is effective depth of slab? (2)
 - e. What is slenderness ratio? (2)
2. Calculate the base pressure diagram developed in concrete retaining wall of following case? (10)

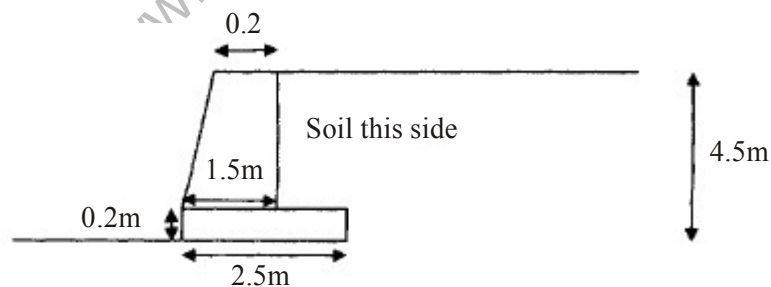


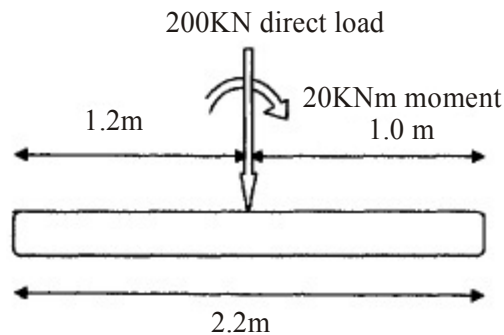
FIG.1

Density of soil $\gamma = 18 \text{ kN/m}^3$

Density of concrete = 25 Kn/m^3

Angle of repose $\varphi = 30$ degree

3. Describe various types of supports and draw its notations. (10)
4. Design a brick foundation for u.d.l. of 40 Kn/m at plinth level assume permissible compressive stress of bricks 60kg/cm^2 . (10)
5. What is middle third rule, explain with diagram and derive formula expression? (10)
6. A rectangular timber beam of size $300\text{mm} \times 400\text{mm}$ is subjected to u.d.l. of 20 kn/m. The span of beam is 6.0 m and is simply supported both sides, find bending tensile stress and compressive stress at centre of beam. (10)
7. Find base pressure at all corner of rigid plate of size $2\text{m} \times 2\text{m}$ resting on elastic mat base, in following case : (10)

**Fig.2**

8. Design the brick column load of 150KN at plinth level, Safe bearing capacity of soil is 90KN/m^2 . Take density of bricks 20KN/m^3 . Assume brick compressive stress 60kg/cm^2 and bonding stress for tension zero. Draw neat diagram. (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.