

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATIONS-2022

B.Tech-IV Semester (Civil)

COURSE CODE (CREDITS): 18B1WCE831(3)

MAX. MARKS: 35

COURSE NAME: Advanced Reinforced Concrete Design

COURSE INSTRUCTORS: Arnav Anuj Kasar

MAX. TIME: 2 Hours

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. Enumerate any three types of checks for Factor of Safety of Retaining Walls. [3]

Q2. For the retaining wall shown in Figure 1:

- Draw the Free Body Diagram showing the location and magnitude of all forces. [2]
- Perform the checks for sliding, overturning and bearing failure of the wall. [5]

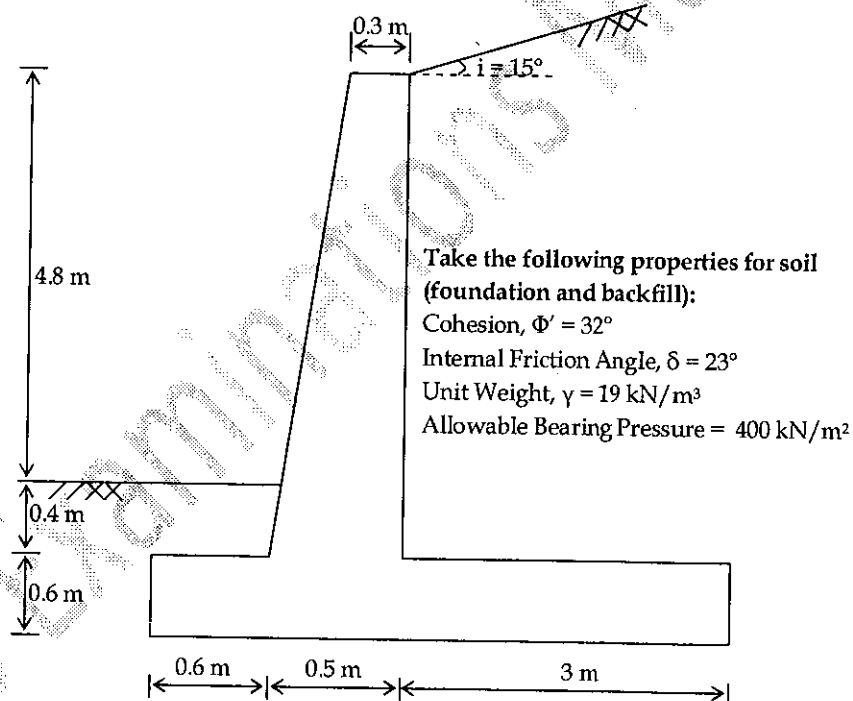


Figure 1

Q3. Briefly discuss the design guidelines for the walls of rectangular water tanks as per IS 3370 Part 4 if L and B are the length and width of the tank respectively. [3]

Q4. Design a rectangular water tank for an underground capacity of 80000 liters for the condition when the tank is full and there is no soil pressure outside. Use M30 Concrete and Fe 415 Steel. Take $\gamma_{\text{sat}} = 18 \text{ kN/m}^3$, $\gamma_{\text{ur}} = 18 \text{ kN/m}^3$ and $\Phi = 30^\circ$ [12]

Q5. Enlist the assumptions for Limit State Design of Reinforced Concrete Elements. [5]

Q6. Answer the following in maximum one sentence:

- a. The minimum number and diameter of main bars in Columns as per IS 456:2000 are? [1]
- b. The spacing of confining reinforcement (ties) as per IS 456:2000 is (three conditions)? [2]
- c. The maximum allowable strain and stress in concrete for LSM are? [2]