

B TECH
(SEM-VI) THEORY EXAMINATION 2018-19
DESIGN OF CONCRETE STRUCTURE

Time: 3 Hours

Total Marks: 100

Note 1. Attempts for questions are in any order as given in the question paper.
2. IS 456:2000 is allowed.

SECTION A

1. Attempt any 10 questions briefly. 2 x 10 = 20

- a. Define Flat Slab.
- b. What do you understand Distribution of bending moments across the Panel width?
- c. Write types of Isolated Footing with Sketch.
- d. Draw the figure of Curved Beam Fixed at Ends.
- e. Give the types of Retaining Wall with Neat Sketch.
- f. Write the formula for (a) Passive Earth Pressure (b) Active Earth Pressure (iii) For Sloping Back Fill.
- g. Define IRC Class AA loading
- h. IS 3370:2009 (Part 2) where it is used?
- i. Define Circular Prestressing.
- j. What do you understand by Load Balancing Concept?

SECTION B

2. Attempt any three of the following: 10 x 3 = 30

- a. What do you understand Components of Flat Slab Construction Briefly Explain?
- b. A brick Masonry wall 230 mm thick carries a load of 370 KN/m inclusive its self weight. Design the footing for wall, The SBS of soil is 150 KN/m² at 01 mtr depth. Use M20 concrete and Fe415 steel.
- c. Design a Slab Culvert for a clear span of 6.5 mtr for Class AA tracked vehicle loading, clear width of roadway is 7.5 mtr, Average thickness of wearing Coat is 80 mm both sides a kerb of size 300mm x 900mm (depth) is provided. Use M25 concrete and Fe415 steel.
- d. Design a rectangular water tank of size 2mx5mx3m resting on the ground. Use M25 concrete and HYSD bars use Approximate Method.
- e. Write Short Notes on the following (i) Freyssinet System of Prestressing (ii) losses in Prestress.

SECTION C

3. Attempt any one part of the following: 10 x 1 = 10

- (a) What are the function of Drop Panel and column head provided in a Flat Slab?
- (b) A Flat Slab is supported on 500mm diameter columns spaced 6mx5m apart in both directions. The column head has a diameter of 1000 mm. The live load is 5.5 KN/m². Determine the Unbalanced Moment in an interior Column.

4. Attempt any one part of the following:**10 x 1 = 10**

- (a) Design a combined Footing for two columns 500 mm x 500 mm each, 5 mtr apart carrying a load of 1600 KN each. Available width restriction is 2.4 mtr. The Safe Bearing Capacity is 200 KN/M². Use M25 concrete and Fe415 steel
- (b) Describe the location of Critical section for calculating the SF and maximum BM, One way shear, Punching Shear and BM criteria for Rectangular Footing along with Sketches.

5. Attempt any one part of the following:**10 x 1 = 10**

- (a) Check the Stability Condition of Counter Fort Retaining wall to retain 4.5 mtr earth above the GL. The top of the earth is to be leveled. The Density of earth is 15 Kn/m³, The angle of internal friction of soil is 30°. The SBC of soil is 200 KN/m² and the coefficient of friction between wall and soil is 0.65.
- (b) Draw the structural Behavior of Cantilever Retaining wall and explain (i) Stem (ii) Heel Slab (iii) Toe Slab

6. Attempt any one part of the following:**10 x 1 = 10**

- (a) Design a Circular Tank with a flexible base for a tank of 1,00, 000 litre Capacity . The depth of water in tank is 6mtr. Use M25 concrete and Fe415 steel. Take unit weight of water as 10 KN/m². Draw the sketch also
- (b) Define the following for Elevated Water Tank (i) Top Dome (ii) Top Ring Beam (iii) Cylindrical Wall

7. Attempt any one part of the following:**10 x 1 = 10**

- (a) Explain the stress distribution Diagram in a Prestressed beam at initial and final stage i.e. before and after the Prestress.
- (b) Determine the percentage of total loss of prestress in a simply supported pretensioned beam of size 150 mmx300mm, having 8 wires of 6mm diameter subjected to an initial prestress of 1000 N/mm² at an eccentricity of 50 mm, Take the following data for calculation of losses. Creep Coefficient =1.6, Loss due to Relaxation = 5% Use M40 concrete.