7E7063

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B.Tech. VII -Semester (Main/Back) Examination November - 2019

Civil Engg.

7CE3A Design of Concrete Structures - II

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No 20S)

1. *IS - 456 (2000)*
2. *IS - 3370 (Part II & IV)*
3. *IRC - 21 (1987)*
4. *IRC - 6 (2000)*
5. *IS 1343 (1980)*

Unit - I

a) What is merits and demerits of prestressed concrete? (4)

b) What do you understand by losses in prestressing concrete? Explain loss of prestress due to curvature effect and wobble effect. (12)

(OR)

a) What is the classification of prestress? Explain in brief. (6)

b) A simply supported concrete beam having cross - section of 300 mm × 500 mm, is loaded with a total UDL of 230 kN over a span of 5m. Find the extreme fiber stresses at mid span and end sections if prestressing force if 1920 kN and the tendon is eccentric, located at 200 mm above bottom fiber. Also sketch the stress distribution diagramme. (10)

Unit - II

2. a) Explain concept of moment redistribution in beams. (6)

b) Draw maximum bending moment

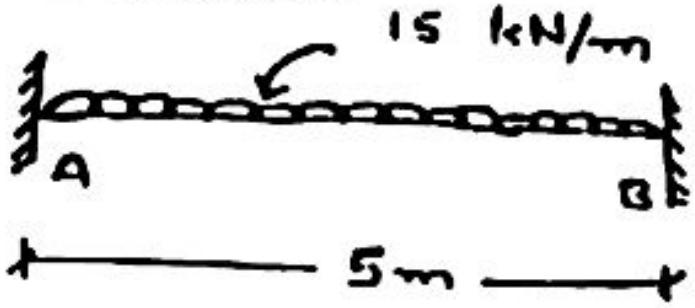

Figure - 2.1

diagramme for a fixed ended beam carrying 15 kN/m load at collapse as shown in figure 2.1. (10)

(OR)

2. Design a rectangular beam having cross - section of 250 mm × 500 mm. Beam is subjected to moment (M_u) = 50 kN - m, shear force V_u = 50 kN and torsional moment T_u = 30 kN - m. Take concrete grade of M20 and steel grade of Fe 415. (16)

Unit - III

3. Derive the expression for meridional thrust and hoop stresses in circular dome. (16)

(OR)

3. Design a rectangular water tank resting on ground having base area of 5 m × 7m. The height of water tank is 4 m and keep a free board of 0.20 m. Assume M - 25 grade of concrete and steel Fe - 415. Assume appropriate data. (16)

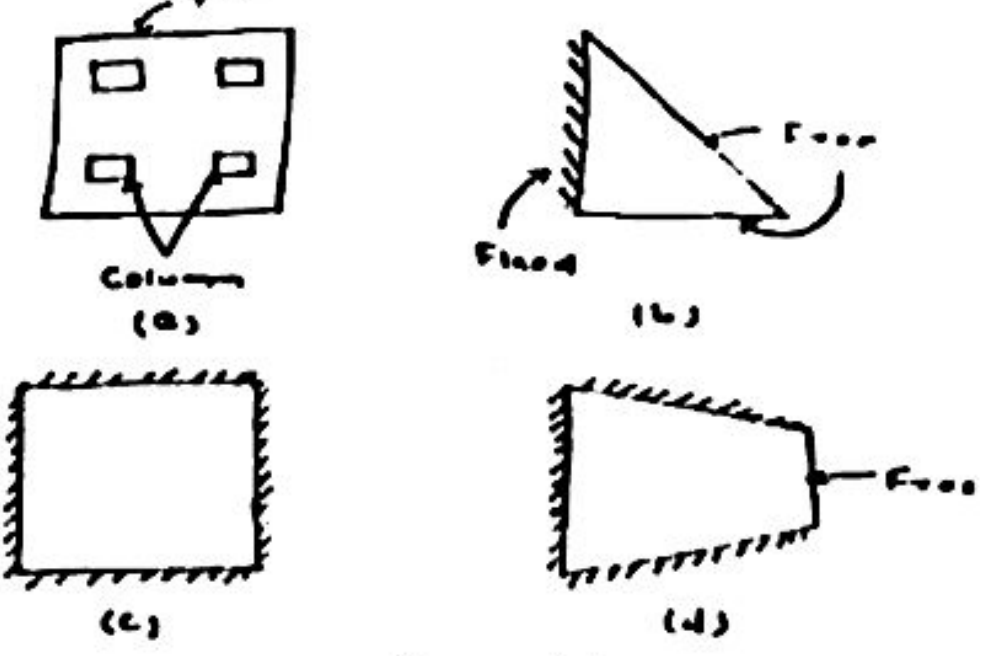

Figure - 4.1

Unit - IV

4. a) Explain counterfort and buttress type retaining wall. (8)

b) Draw yield line diagramme of slabs given in figure 4.1. (8)

(OR)

4. Design a cantilever retaining wall to support a bank of earth 5 m high above the earth level at the toe of thhe wall. A building is to be built on the backfill. Assume that a 3 m surcharge will approximate the lateral earth pressure effect.

Consider : Earth density = 17 kN/m³.

Angle of internal friction = 35°

Coefficient of friction between concrete and sail = 0.45 bearing capacity = 150 kN/m². Use M - 30 grade of concrete and Fe 415 grade of steel. (16)

Unit - V

5. Design a deck slab for the following data :

Clear span = 6 m

Bearing width = 450 mm

Thickness of a deck slab = 500 mm

Width of deck slab – 8.5 m

With of foot path on either side – 1m

Wearing coat = 100 mm

Loading – IRC class (AA) tracked

Concrete – M - 25 and steel – Fe - 415 (16)

(OR)

5. Write the short note on following :

a) Hydraulic factors in bridge design.

b) Disposition of tracked vehicle (AA class)

c) Design load For kerb

d) Check for shear stress (As per IRC : 2L - 1987) (16)