

[4]

OR

A pretensioned prestressed concrete beam of cross section 250mm × 400mm and span 8m is applied with an initial prestressing force of 800 kN at an eccentricity of 80 mm by tendons of 800 mm². Estimate the percentage loss in prestress. Take $E_c = 35000 \text{ N/mm}^2$, $E_s = 200 \text{ kN/mm}^2$ and creep coefficient for concrete = 1.6. 14

Total No. of Questions : 5]

[Total No. of Printed Pages : 4

Roll No

CE-702

B.E. VII Semester

Examination, December 2016

Advanced Structural Design - II (RCC)

Time : Three Hours

Maximum Marks : 70

- Note:** i) Attempt five questions, one from each unit. All questions carry equal marks.
ii) Use of relevant IS codes, IRC publications and design tables is permitted.
iii) Draw reinforcement details for design problems.
iv) Missing data if any, may be suitable assumed.

Unit-I

1. a) Discuss structural systems commonly used for earthquake resistant design of tall buildings. 4
b) Find bending moment, shear force and axial force in Beam EF and Column EH using portal method (Fig. 1) 10

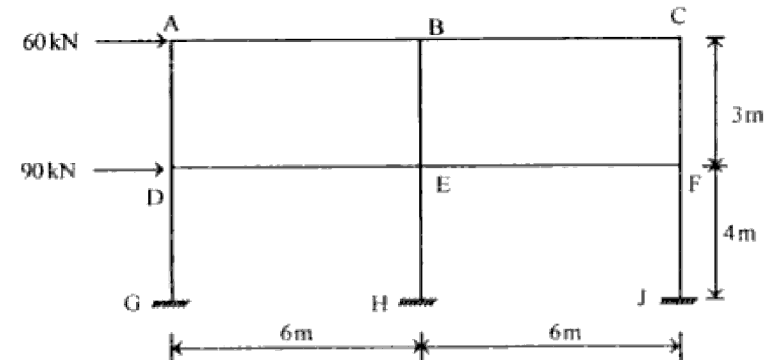


Figure .1

[2]

OR

Design a high shear wall of length 4.0 m and thickness 200 mm (Fig. 2) subject to the following forces : 14

DL + LL : Axial force = 1400 kN, Moment = 400 kNm, Shear = 20 kN

SEISMIC : Axial force = 250 kN, Moment = 4000 kNm, Shear = 600 kN.

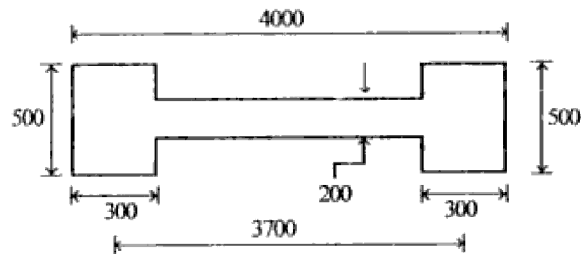


Figure-2

Unit-II

2. Design the stem of a cantilever retaining wall to retain leveled earth 6.0 m above base slab. Take density of soil as 18 kN/m^3 and angle of repose as 30° . Apply check for shear. Sketch the details. 14

OR

Design the stem of a counter fort retaining wall to support earth embankment 10 m high above base slab. Take density of soil as 18 kN/m^3 and angle of repose as 30° . Assume centre to centre spacing between counter forts as 5 m. 14

[3]

Unit-III

3. Design the cover slab, wall and base of a 400 KL capacity cylindrical tank with flexible wall-base connection. The depth of water is 5 m. The tank is resting on levelled ground. Sketch the details. 14

OR

The diameter and height of cylindrical wall of an Intze water tank are 8m and 4m respectively. The top dome's rise is 1.6m while the bottom's rise is 1.2m. The depth of conical dome is 2m and diameter of bottom ring beam is 6.0m. Design the top dome, top ring beam and middle ring beam. Assume the thickness of cylindrical wall as 200mm. 14

Unit-IV

4. Design the side wall of a bunker to store 500 kN of coal for the following data : 14
- i) Unit weight of coal = 7.8 kN/m^3
 - ii) Size of bunker = $3.0 \text{ m} \times 3.0 \text{ m}$ with hopper portion of 1.2 m high with a central hole of size $0.5 \text{ m} \times 0.5 \text{ m}$.

Angle of repose = 30° . The stored coal is to be surcharged at its angle of repose.

OR

Distinguish between behaviour of Bunker and a Silo. Explain the procedure for design of a Silo. 14

Unit-V

5. Design a solid slab bridge for class AA tracked vehicle loading for clear span of 6.0 m, and clear width of roadway = 7.5 m. 14