

5. a) Explain pre-tensioned and post tensioned.
- b) What are different type of “losses” encountered in prestressing concrete.
- c) Discuss advantages of prestressed concrete.
- d) Explain the method of finding reaction factors for B.M in longitudinal girders.

OR

A RCC single span T beam bridge is to consist of 5 beams 2.0 m apart. The span of the bridge is 10m clear with end bearings of 500mm. The L.L. on the bridge is 20kN/m^2 including impact. The carriage way over the bridge is to be 8.0m wide with a footpath of 1.5m on either side. Design the deck slab.

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Roll No

CE - 702

B.E. VII Semester

Examination, December 2015

Advanced Structural Design - II (RCC)

Time : Three Hours

Maximum Marks : 70

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
- ii) All parts of each question are to be attempted at one place.
- iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
- iv) Except numericals, Derivation, Design and Drawing etc.

1. a) Define substitute frame.
- b) Discuss classification of shear walls.
- c) Explain the difference between a braced and an unbraced building. What condition should be satisfied by a braced building?
- d) Derive the expression for moment of resistance of a rectangular shear wall.

OR

Figure-1 shows an industrial portal frame, which supports 120 mm thick roof slab. After the analysis, the following values are found at working loads.

Section	Bending moment	Comp. force	Shear force
C	- 205 kN-m	125 kN	108 kN
D	+ 124 kN-m	65 kN	65 kN

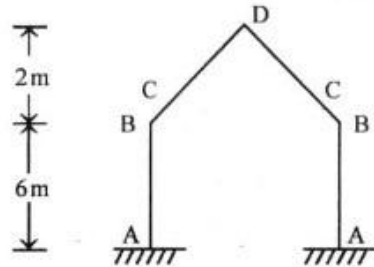


Figure 1

Design the principal rafter CD. Use M20 concrete and Fe415 steel.

2. a) Define retaining wall.
- b) Discuss the functions of shear key.
- c) Explain the design of counterfort.
- d) Design the stem of T-shaped cantilever type retaining wall to retain earth embankment 4.8 m high above ground level. Take base width = 4.0 m, T_{oc} projection = 1.2 m, Thickness of base slab = 540 mm. Unit weight of earth retain = 18 kN/m^3 and $\phi = 30^\circ$. SBC = 180 kN/m^2 and $\mu = 0.35$, Traffic load = 20 kN/m^2 . Height of parapet = 1.0 m, use M20 concrete and Fe415 steel.

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OR

Check the stability of above retaining wall.

3. a) Name the different components of an intze tank.
- b) Name the loads to be considered in designing bottom ring beam of water tank.
- c) Discuss the design of underground water tanks.
- d) Design a rectangular tank $6\text{m} \times 4\text{m} \times 3\text{m}$ size resting on firm ground.

OR

Design a circular tank with flexible base for capacity = 400 kL. The depth of water is to be 4.0 m including a free board of 200 mm.

4. a) Define silos.
- b) Give formulae for B.M for rectangular Bunker.
- c) Explain Janssen's theory.
- d) Design side walls of a rectangular bunker of capacity 300 kN to store coal using M20 concrete and Fe415 steel. Take unit weight of coal = 8 kN/m^3 , $\phi = 25^\circ$, $\mu = 0.45$.

OR

Design the hopper bottom of above bunker.