

Roll No

MVSE-104**M.E./M.Tech., I Semester**

Examination, December 2014

Design of Concrete Structures*Time : Three Hours***RGPVONLINE.COM** Maximum Marks : 70*Note:* Answer all questions. Internal choices are given.**Unit - I**

1. A three story school building is in seismic zone IV. Its foundation is on medium soil and the period of oscillation of building is 0.20 seconds. Calculate horizontal seismic coefficients (d_h) by 10

i) Static method and ii) Dynamic method

OR

Design a simply supported deep beam of length 5.0 m loaded from two columns at 1.50 m from each ends with 3500 kN. The total depth of beam is 3.0 m and width of support is 550 mm. Assume M40 concrete and Fe 415 steel.

2. Describe in details (any three) 3×3=9
- Design of flat slab by coefficient method of IS-456.
 - Calculation of basic wind pressure for a multistory building, as per IS-875.
 - Design procedure of Raft foundation with six columns.
 - Analysis of grid floor by Timoshenko's plate theory.
 - Arrangements of live loads on RCC frame of multistory building, as per IS-875.

Unit - II

3. Design an Intze tank for capacity of 400 KL. Use IS-3370. 10

OR

Design an rectangular tank for capacity of 100.KL. Use IS-3370.

4. Describe in details (any two) 8
- Equivalent width method of slab designs.
 - IRC loadings for bridge design.
 - Design procedure of T-beam deck bridge.

Unit - III

5. Design a post tension prestressed concrete beam of an effective span of 9.0 m. The beam has to be a rectangular cross section, it carries dead load of 5 kN/m and live load of 12 kN/m. Use M35 and tendon of $f_{u, \text{steel}} = 1500 \text{ N/mm}^2$. 11

OR

A pre tension prestressed beam of 7.0 m span has a cross section of 300 × 500 mm and is prestressed with 1500 kN force at transfer. The tendon has cross sectional area of 1500 mm² of steel and has a parabolic profile with a maximum eccentricity of 150 mm at the mid span. Determine the loss of prestress. Take $E_s = 2.1 \times 10^5 \text{ N/mm}^2$ and $E_c = 3 \times 10^4 \text{ N/mm}^2$. If pre tension beam is replaced by post tensioning beam, what will be change in loss.

6. Write short notes (any two) 6
- Methods of post tensioning
 - Stress in Anchorage zone
 - Difference in moment resisting behaviour of RCC and PSC section.

Unit - IV

7. Design a bunker of 2.5 × 2.5 × 3.0 m (ht) to store coal. The height below bunker (clearance) is 3.0 m. Design the supporting column, (four in number) also. 10

OR

Design a circular a Silo for storing wheat, with internal diameter of 5.0 m. The height of Silo is 16 m. The clearance below silo is 3.0 m. The silo is supported on six columns.

8. Write short notes (any two) 6
- Difference between bunker and silo
 - Janssen's theory
 - Airy's theory