

2371

B.Tech. 6th Semester (Civil Engg.) Examination,

December-2011

DESIGN OF CONCRETE STRUCTURES-II

Paper-CE-302-E

Time allowed : 3 hours] [Maximum marks : 100

Note : (i) *Attempt any five questions.*

(ii) *Use of I.S. Code 456-2000 and 3370-1976
(Vol I to IV) are permitted.*

(iii) *Draw neat sketch of your design.*

(iv) *Assume suitable data if missing or required.*

1. (a) What do you understand by modification of moments ?

(b) How will you calculate Shear Force, Bending Moment and Torsional Moment at a point P, at an angle ϕ ; from one support of curved beam.

8+12=20

2. (a) What are the pre-requisite conditions for designing a flat slab as per I.S. Codes.

- (b) Design a suitable stair case for Multi-storeyed building having staircase hall $2.5 \text{ m} \times 4.5 \text{ m}$. The height between floors is 3.5 m . Live load for design may be 300 kg/m^2 . 10+10=20
3. Design a pile cap for a column $600 \text{ mm} \times 600 \text{ mm}$ carrying a load of $240,000 \text{ kg}$; supported on four piles. The piles are of size $300 \text{ mm} \times 300 \text{ mm}$ and their centre to centre distance is 1 metre. 20
4. (a) Explain different type of joints to be provided in liquid retaining structures. 10
- (b) Design a circular tank with flexible base for capacity of 500 kilolitre. Assume suitable stresses as per I. S. codes. 10
5. Design a bunker with hopper bottom to store wheat, for a capacity of 20 M. T. Angle of repose of coal is 30° . The stored wheat is to be surcharged at an angle of repose. Wt of weight is 600 kg/m^3 . 20

6. Write short notes on :

- (a) Method of analysis of a building frame.
- (b) Testing of beam and column sections.
- (c) Analysis of stresses in a corner column.
- (d) Assumptions made in yield line theory. $4 \times 5 = 20$

7. (a) Distinguish between pre-tensioning and post tensioning of Pre-Stressed concrete.

- (b) What are the assumptions made in Pre-Stressed concrete design as per I. S. code. $10 + 10 = 20$

8. (a) What do you understand by Isotropically reinforced slab ?

- (b) Design a square slab $5\text{m} \times 5\text{m}$ simply supported on all four edges carrying a live load of 600 kg/m^2 . Assume load factors of 1.5 and 2.2 for dead load and live load respectively use all other data as per IS Code: 456 : 2000. Assume

ultimate compressive strength $\sigma_{cu} = 280 \frac{\text{kg}}{\text{cm}^2}$

yield stress in steel $\sigma_{st} = 2400 \frac{\text{kg}}{\text{cm}^2}$. $8 + 12 = 20$