(d) What are the various elements of Intz type tank and their design principles ?

(e) Explain in detail identification of seismic damages in RCC buildings.

J-21-0070

B. Tech. EXAMINATION, 2021

Semester VI (CBCS)

DESIGN OF CONCRETE STRUCTURES–II

CE-601

Time : 2 Hours   *Maximum Marks : 60*

The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.

Note : Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D. Q. No. **9** is compulsory. Assume suitable data if missing or required. Use of code of IS : 456 : 2000 is allowed.

Section A

1. Design rectangular footing for two columns A and B, carrying loads of 800 kN and 900 kN respectively.

Column A is 300 mm × 300 mm in size and column B is 400 mm × 400 mm in size. The centre to centre spacing of column is 4 m the safe bearing capacity of soil is 200 kN/m². Use M_{20} mix, $\sigma_{st} - 140\,\text{N/mm}^2$. **15**

2. Two columns 6 m apart between centres carry loads of 1500 kN and 2500 kN respectively. The sizes of the columns are 500 × 500 mm and 700 × 700 mm. Design a trapezoidal foundation. Projections beyond the centre of the column parallel to the length of the foundation are 0.8 m and 1.4 m. Safe bearing capacity of the soil is 300 kN/m². **15**

Section B

3. Explain in detail about the stability check for a retaining wall. **15**

4. Design a counterfort retaining wall to following particulars :

   Height of wall above general ground level = 5.50 m

   Safe bearing capacity of soil = 160 kN/m²

   Angle of repose of soil = 30°

   Weight of soil = 16000 N/m³

   Spacing of counterforts = 3 m centres

   Use M_{20} grade of concrete and Fe 415 steel. **15**

Section C

5. Design a circular tank with flexible base for capacity of 500 kiloliters. Assume suitable stresses as per IS Codes. **15**

6. Explain different types of joints and their spacing to be provided in liquid retaining structures. **15**

Section D

7. Explain the design philosophy of earthquake resistant structures. **15**

8. Draw the ductile detailing provision of an RC column as per IS Code of practice and explain the salient features. **15**

(Compulsory Question)

9. Write short notes on the following : **3×5=15**

   (a) Explain steps involved in wind load analysis of elevated water tank.

   (b) Strap footing and raft footing

   (c) Explain the method of designing a shear key for a retaining wall.