

BACHELOR OF ENGINEERING (CIVIL ENGINEERING)
FOURTH YEAR. 2ND SEMESTER SUUPLEMENTARY EXAM 2023
DESIGN OF STRUCTURES-III

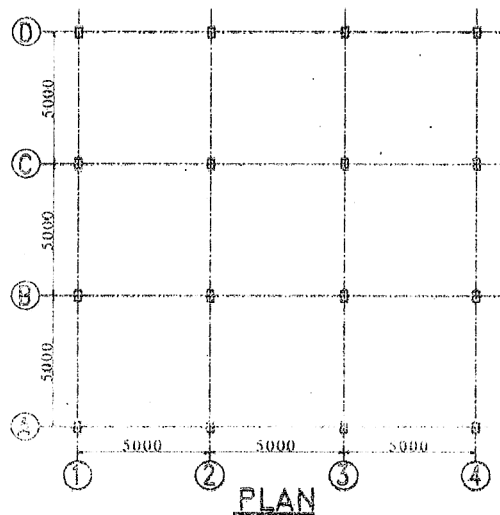
Total Marks : 100

Assume reasonable value of any data if required.

IS code No.1893(Pt. 1), 875 (Pt. 3), 456 & SP 16 and IRC 6 & 21 are allowed in examination hall

Answer any ^{four} two question

1. A four storied Institutional building of 15m x 15m as shown in fig. located in Kolkata



Floor to floor height = 3.5m. Plinth height = 0.6m. Column size = 400mm x 400mm

Outer wall = 250mm thick brick wall

Calculate design wind forces to different floor level.

25

2. Design a suitable pile cap for a RCC column of size 400mm x 400mm with total vertical load – 800 KN, moment in both X and Y direction = 50 KNM
 Pile dia – 400 mm, Vertical capacity – 300KN, Horizontal capacity – 60KN
 Uplift capacity - 100 KN
 Apply 'Limit State Method' as per IS 456. Grade of concrete M25 and
 Grade of steel Fe 500
 Draw the reinforcement arrangement of pile cap.

25

[Turn over

3. A RCC slab culvert for a state highway with following data:
Carriage way =7.5m wide (two lane), Kerb =600mm wide, clear span = 6.0m, wearing coat = 80mm, width of bearing = 400mm.
Loading –IRC Class A or AA whichever gives the worst effect.
Design the RCC deck slab. Grade of concrete M25 and Grade of steel Fe 415
Draw the detail of reinforcement of the deck slab. 25
4. A cylindrical tank of capacity 7,00,000 lits is resting on good unyielding ground.
The depth of tank limited to 5m. A free board of 300 mm may be kept.
The wall and base slab are casted integrally. Design the tank using IS code method.
Grade of concrete M20 and Grade of steel Fe 500.
Draw the detail of reinforcement of the tank. 25
5. Design a rectangular combined footing with two column 'A' of size 500mm x500mm and column 'B' 400mm x400mm. A load of 750kN is acting on A column and 600 kN load is applied on B column. Column center to center distance 3000mm. Safe bearing capacity of soil is 150 kN/sqm. Boundary line is 300mm away from column B.
Grade of concrete M25 and Grade of steel Fe 500.
Draw the reinforcement arrangement of foundation. 25