Roll No .....

AR-315 (CBGS)

B.Arch. V Semester

Examination, November 2019

Choice Based Grading System (CBGS)

Modern Structural Systems

Time : Three Hours

Maximum Marks : 50

Note: i) Attempt any five questions out of eight .

ii) All questions carry equal marks i.e. 10 marks.

1. Design a Isolated footing to carry an axial load of 1000kN through a column of size 400×400mm having 4–25ϕ bars.
   SBC of soil = 110kN/m²
   Assume footing to be 1.5m below GL.
   Use M25 and Fe 500

2. Explain design criteria and IS provisions for the following.
   a) Continuous Footing
   b) Isolated Footing

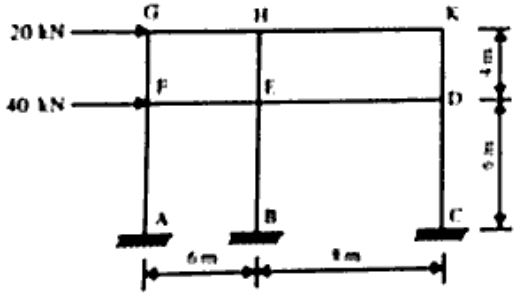
3. Design a combined footing for two columns of size 450×450mm and 400×400mm. The column carry axial loads of 900kN and 1100kN respectively and c/c spacing between the column is 3.7m. The 400×400mm is flushed with the property line. The SBC is 120kN/m² at 1.8m below the ground level. Use M25 and Fe500.

4. Design a combined trapezoidal footing for two columns of size 350×400mm and 400×450mm. The column carry axial loads of 850kN and 1200kN respectively.
   The SBC is 150kN/m².
   Use M25 and Fe500.

5. Explain methods of post tensioning with figures.

6. A Pre-tensioned beam of size 2800×300mm is pre-stressed by twelve wires each of 8mm diameter. All the wires are stressed initially to 1000N/mm² with their centroids located at 100mm from soffit of beam.
   Calculate the final percentage loss in stress due to elastic deformation, creep, shrinkage and relaxation.
   - Take relaxation of steel stress at 90N/mm²
   - Es as 210kN/mm²
   - Es as 35kN/mm²
   - Creep coefficient as 1.6
   - Residual shrinkage strain as 0.0003

7. Analysis following frame by portal frame method.



8. Design interior panel of flat slab of size 4×4m without providing drop and column head. Since column size id 400×400mm.
   - Take live load on panel = 3.5kN/m²
   - Floor finish load = 1.25kN/m²
   - Use M20 and Fe500

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