B.E. Civil Engineering Seven Semester

CE709 - Elective-II : Advanced R.C.C. Design

P. Pages : 2 **GUG/W/18/1742**

Time : Three Hours * 1 3 6 9 * Max. Marks : 80

Notes :
1. All questions carry equal marks.
2. Answer all questions.
3. Due credit will be given to neatness and adequate dimensions.
4. Assume suitable data wherever necessary.
5. Diagrams and Chemical equation should be given wherever necessary.
6. Illustrate your answers wherever necessary with the help of neat sketches.
7. Use of slide rule, Logarithmic tables, Steam tables, Mollier's chart, Drawing instruments, Thermodynamic tables for moist air, Psychrometric charts and Refrigeration charts is permitted.
8. I.S.I. Hand Book for structural steel section, I.S. Code 8000/1962 or 1964, I.S. 456 (Revised), I.S. 875 may be consulted. IS 3320 Part I & II IRC 4624.

1. The substitute frame shown in fig. 1 has to analysed for positive & negative moment in the beam AB, BC & CD. Use The following data to estimate maximum moments in beam & column. The beam are spaced at 3m interval C/C. **20**

i) Thickness of floor = 110mm

ii) Live load (Residential flat) = $2.05 kN / m^2$

iii) Floor Finish = $0.55 kN / m^2$

iv) Size of beam = 200mm by 400mm

v) Size of column = 200mm by 400mm.

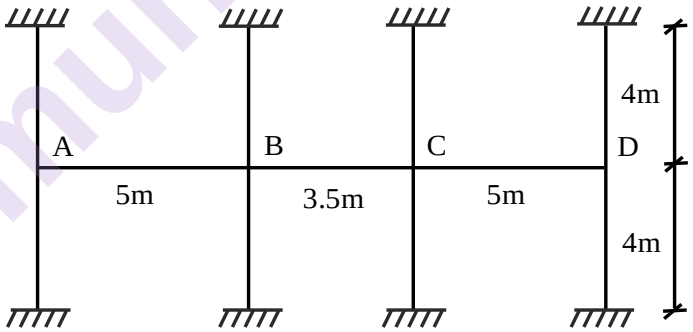

Fig.1

OR

2. A four storyed multistory building from has four equal bay's of 4.2m each and the height between floor in 4m. The wind load acting at roof level and various floor level are **20**

$H_1 = 5kN$ $H_3 = 11kN$

$H_2 = 11kN$ $H_4 = 11kN$

The column have the some cross section Estimate the moment in the column & beam.

3. Design the top dome, Top ring beam and cylindrical tank wall far tank capacity of 50000 liters type tank for inleze **20**

Fx = 20 MPa, Fy = 415 MPa.

OR

4. Design a R.C.C slab deck bridge for the following requirement. **20**

i) Clear span = 6m.
ii) Width of support = 400 mm
iii) Width of carriage way = 2 lane 7.5 m wide.
iv) Width of Kerb = 600 mm.
v) Loading condition = According to IRC 'AA'.

Sketch the reinforcement in the longitudinal and cross section of slab. The design should confirm the specification of the bridge code.

5. a) The foundation for a structure is to consist of 16 piles to carry a total load of 8000 KN. The pile are spaced at 1.25 m. centre to centre. They are driven Through a made up ground into hard stratum which is available at a depth of 6 m. Design one of the pile. Use M20 grade concrete and fe415 HYSD steel. **16**

b) Short note on **4**

i) Stress during handling of piles.

ii) Pile cap.

OR

6. Design a box culvert having inside dimension $3.5m \times 3.5m$. The box culvert is subjected to a superimposed Dead of load of 12000 N/m^2 & a live load of 45000 N/m^2 from the top Assume unit weight of soil as 18000 N/m^3 & angle of repose 30^o use M20 and fe415 steel for the purpose of design 1 m length of the box is consider & Analysed is done for the condition of live load. Dead load and Earth pressure acting with no water pressure from in side. **20**

7. Design a bunker to store 300 KN of coal for the following Data. **20**

i) Unit weight of coal = 8340 N/m^3
ii) Angle of repose = 30^o

The stored coal is to be surcharge at its angle of reposed. Take permissible stress in steel as 140 N/mm^2

OR

8. A cement silos has an internal diameter of 10 m with the height of cylindrical portion being 30 m. The density of cement is 15.2 KN/m3 coefficient of friction between concrete and material is 0.70 The angle of repose of the material is 17.5 degree. Adopting M-20 grade concrete and fe415 HYSD bar. Design the Thickness and the reinforcement required at the bottom of the cylindrical portion of the silos using Janss Theory. **20**

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