# **QUESTION BANK**

**Advance Concrete Structure**

**VII semester**

Section A:

Unit I

Design of rectangular beam

Q.1 Design of doubly reinforced rectangular section having dimensions 250x400 mm subjected to superimposed load of 40 KN/m over effective span of 5m. with concrete M20 and Steel Fe415.

Q.2 Torsional Reinforcement

Design a rectangular beam section of size 250x450 mm. subjected to b.m. of 30 KN-m. Shear force of 40 KN and torsional moment of 20 KN-m at working condition. Use M20 with Fe 415 steel. Design the longitudinal and transverse reinforcement.

Q.3 Design a rectangular beam section of 300mm width and 500mm effective depth which is subjected to ultimate moment of 50 KN-m. Ultimate shear force of 50 KN and ultimate shear force of 50 KN and ultimate torsional moment of 40 KN-m. Use M20 and Fe 415 steel..

Q.4 A T-beam of class room floor 600mm deep (effective). The thickness of flange is 120 mm and width of web is 250 mm. Determine the area of steel required to resist a moment of 646KN-m. Assume effective flange width 1100mm. Use M20 mix conc. and Fe415 steel.

Unit II

Q. 1 Design a isolated footing for a column carrying an ultimate load of 800 KN and ultimate moment of 100 KN about an axis bisecting the depth of column. The size of column is 300x600mm and it is reinforcement with 6 bars of 20mm, the SBC of soil is 250 KN/m2. Use M20 mix of concrete and Fe 415 steel.

Q. 2 Design a biaxially loaded RCC column subjected to Pu = 300KN, Mux = 45 KNm, Muy = 60 KNm with the size of column as 250x450mm. Use M15 concrete with Fe415 steel, the unsupported length of column is 3.5m with the effective cover of 40mm.

Q. 3 Design a biaxilly eccentrically loaded braced column from the following data .

1. factored axial load = 2000 KN=Pu

2. Mux at top = 220 KNm

3. Muy at top = 120 KNm.

4. Unsupported length = 8 m.

5. Effective length in longer direction =7.5m.

6. Effective length in shorter direction =6m.

7. Column size =400x600mm with conc. M25 and steel 415.

Q.4 Design a combined footing for column C1 and C2 For size 800X800mm and 600x600 mm carrying axial load of 1500KN and 1000 KN. The columns are space at 4m with SBC = 160KN/m2 use M20 and Fe415 . Width of footing is restricted to 2.2m.

Q.5 Design a biaxially loaded column of size 300x500mm carrying working load of 450 KN along with Mx = 30KNm, My = 20KNm with M15 conc. and Fe15 steel.

Section – B

Unit: IV

Design of two way slab

Q.1 Design a slab panel of clear dimension (4.5x6) supported on 230mm thick brick wall with two adjacent edges continuous. The slab carries two adjacent edges continuous. The slab carries live load of 2.5 Kn/m2 with floor finish 0.5 KN/m2. Use M20, Fe415.Design for flexure shear development and deflection and show reinforcement details.

Q2 Design a two way slab panel of effective dimension 4mx6m with all 4 edges discontinuous , the slab carries superimposed load of 2.5 KN/m2 .with floor finish of 0.5 KN/m2 .Use M20, Fe415.

Q3 Design a cantilever retaining slab with 4m high stem, retaining backfill with horizontal level surface , Backfill properties are r=18 KN/m3 , =30,Use M20,Fe415 . SBC =150 KN/m2

Unit: V

Combined footing:

Rectangular combined footing:

Design a combined footing for column C1 and C2 for size 800x800mm and 600x600mm carrying axial load of 1500 KN and 1000KN. The column are spaced at 4m with SBC =160KN/m2. Use M20 and Fe 415 width of footing is restricted to 2.2m.

Design of portal frame

Q An assembly hall 20m long and 12m wide between centres of columns is supported by a hinge base base reinforced concrete portal frame spaced at 4m with the height of column upto centre of beam as 5.5m. Design intermediate portal frame taking live load =1.5 KN/m2, floor finish +0.75 KN/m2 with M15 and Fe415.

Unit VI

Column subjected to moment.

Q.1 Design a square footing for a column 400X400 mm subjected to ultimate load of 1000KN along with ultimate moment of 50 KNm . Use M20, Fe415 . SBC of soil =150 KN/m2.

Q.2 Design a footing for a column carrying a ultimate moment of 100KN about an axis bisecting the depth of column. The size of column is 300x600mm and it is reinforced with 6 bars of 20mm, the SBC of soil 250 KN/m2. Use M20 mix of concrete and Fe 415 steel.