Roll No. ....

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DESIGN OF CONCRETE STRUCTURE-I
CE-303N

Time : Four Hours]   [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Assume other data suitably. IS 456 : 2000 is allowed.

Unit I

1. Explain briefly the following :

 (a) Balanced section

 (b) Under reinforced section

 (c) Over-reinforced section.

2. What is the difference between limit state method and working stress method, Also explain the stress strain relationship for concrete.

Unit II

3. Design a simply supported rectangular beam to resist a udl 25 kN/m for the length 8 m. Use M 15 mix and HYSD BAR steel. Apply all the check on the beam.

4. A reinforced concrete beam is simply supported over a span of 5 m and it carries a uniformly distributed load of 35000 N/m including its own weight. If the size of the beam is restricted to 400 × 500 mm, determine the area of tension and compression steel if required. Given M25 concrete and HYSD bars.

Unit III

5. A simply supported beam 200 mm wide and 400 mm effective depth is loaded with a UDL of 16 kN/m. The effective span of beam is 4.4 m. Design the shear reinforcement if tension steel provided is 4 bars of 22 mm diameter and concrete used is M20. Use mild steel plain bars of stirrups.

6. A rectangular beam 450 mm wide is subjected to the following at at section : B.M of 45 kNM, S.F. of 30 kN and Torsional Moment of 20 kNm. Design the section for Torsion. f_y = 250 N/mm^2 and M20 Concrete.

Unit IV

7. Design a R.C. slab for interior room having size 6 m × 5 m. The width of supporting beams is 200 mm. The slab carries superimposed load of 3.5 kN/mm². Use M-25 grade of concrete and steel grade Fe-415.

8. (a) Explain the design step for cantilever Retaining wall with example.

   (b) What are the disadvantages of plasticizers ?

   (c) What is the difference between false set, initial set and final set ?