PVP 14

Code: CE5T1

III B.Tech - I Semester – Regular/Supplementary Examinations October 2019

DESIGN AND DRAWING OF CONCRETE STRUCTURES - I

(CIVIL ENGINEERING)

Duration: 3 hours Max. Marks: 70

Use of IS:456-2000 and design charts from SP-16 Charts allowed.
Data not given but found necessary may be assumed suitably

PART – A

Answer any **ONE** question. 1 x 28 = 28 M

1. Design a R.C. slab for a room measuring 4 m X 6 m in size (Clear Dimensions). The slab is simply supported on all the four edges on 300mm wide masonry wall, with corners held down and carries a superimposed load of 3.1kN/m^2, inclusive of floor finishes etc. Use M20 mix, Fe 415 steel. Sketch the reinforcement details. 28 M

(OR)

2. A reinforced column of 6 m effective height is subjected to a working axial live load of 600 kN and bending moment of 300 kN-m. Design a column by limit state design with width not exceeding 300 mm using M20 concrete and HYSD Fe415 bars. Sketch the reinforcement details. 28 M

PART-B

Answer any **THREE** questions. All questions carry equal marks.

3 x 14 = 42 M

3. Compute the maximum stress developed in concrete and steel in a rectangular beam of cross-section 200mm X 400mm with effective depth as 365mm. It is reinforced with 4 No. 16mm dia M.S bars on tension side. The beam is simply supported over a span of 6m and carries a load of 7000 N/m inclusive of self weight. Concrete used is M20.

   14 M

4. a) Draw and explain stress- strain curves for concrete and deformed bars. 7 M

   b) Show that the limiting depth of neutral axis for a rectangular cross section reinforced with Fe415 grade steel is 0.48d. 7 M

5. Determine the reinforcement required for a rectangular beam section with the following data:

   Width of the section= 300 mm;
   Depth of the section= 550mm,
   Factored Bending Moment= 80kN-m;
   Factored torsional moment= 40kN-m
   Factored shear force= 70kN. Use M20 grade concrete and Fe415 grade steel. 14 M

6. Design a short circular column 3m long to carry an axial load of 250kN if both ends of the column are fully restrained using i) Lateral ties and ii) helical steel Use M20 grade concrete and Fe415 grade steel. 14 M

7. Design a slab simply supported on all the four edges for a room 6m x 3m clear in size. The superimposed working load is 3.0kN/m^2. Use M20 grade concrete and Fe415 grade steel. Assume floor finish. 14 M