

Code: CE5T1

**III B.Tech - I Semester – Regular/Supplementary Examinations
October 2018**

**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.

PART – A

Answer any **ONE** question.

1 x 28 = 28 M

1. Design a rectangular reinforced concrete beam of 6 m effective span simply supported on 300 mm wide supports. The intensity of imposed load on the beam is 50 kN / m. The size of beam is limited to 300 mm x 500 mm. Use M20 concrete mix and HYSD bars of grade Fe415.

(OR)

2. Design a slab continuous over 3 equal spans of 6 m clear distance. The intensity of imposed uniform load on slab is 5 kN / sq-m. Provide necessary checks and sketch the reinforcement details.

PART-B

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

$$3 \times 14 = 42 \text{ M}$$

3. a) Explain the philosophy of working stress design for reinforced concrete sections as per IS 456-2000. 7 M
- b) Derive the stress block parameter for a reinforced rectangular cross section in limit state method. 7 M
4. Design a simply supported rectangular beam of 6 m effective span and is supposed to carry an imposed uniform load of 30 kN/m. Use M25 concrete mix and Fe415 grade steel. 14 M
5. A T-beam of flange 750 mm x 120 mm and rib 250 mm x 380 mm and having area of tension reinforcement as 3500 sq-mm with an effective cover of 50 mm. Calculate the moment of resistance of the section. Use $f_{ck} = 20 \text{ Mpa}$ and $f_y = 415 \text{ Mpa}$. 14 M
6. A RC rectangular beam of size 300 mm x 500 mm (effective) and reinforced with 4 number 20 mm diameter bars on tension side. Calculate the shear reinforcement required if the section is subjected to a factored shear force of 250 kN. Use M20 grade concrete and Fe415 steel. 14 M
7. A RC rectangular column 3 m long of size 300 mm x 450 mm is to carry a factored axial load of 1200 kN and moments 50 kN-m and 75 kN-m parallel to short and long edges respectively. Design the column using M25 grade concrete and Fe415 grade steel. 14 M