

Code: CE5T1

III B.Tech - I Semester – Regular Examinations - November 2014

**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 is allowed.

PART – A

Answer any **ONE** question.

1. Design a Reinforced concrete beam of span 7m, carrying a load of 20kN/m throughout its length. The beam is simply resting on brick masonry walls with 230mm width. Use M30 grade concrete and Fe500 steel bars. Keep the depth as 1.5 times width. 28 M

OR

2. Design a reinforced concrete slab of size 6m x 4m whose adjacent short edges are discontinuous and monolithic construction with the supports. The slab has to carry a live load of 5kN/m² and a floor finish of 1.5kN/m² and the floor partition is 1kN/m². Use M20 concrete and Fe415 steel. Sketch the details of reinforcements also. 28 M

PART – B

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

3. Draw Stress Block Diagram and evaluate following expressions for L.S.D 14 M
 - a) Neutral Axis Depth.
 - b) Lever Arm
 - c) Moment of Resistance.

4. A simply supported R.C.C beam 230mm wide and 450mm overall depth is reinforced with four number of 16mm diameter bars. Design the shear reinforcement, if the Shear force at service state is 180kN. Use M20 grade concrete and Fe415 grade steel. 14 M

5. Design a Circular column of 4m high, is effectively held in position at one end and pinned at other end. The diameter of column is 400mm. Calculate the reinforcement if it is required to carry a factored axial load of 1600KN. Use M30 mix and Fe500 grade steel. 14 M

6. Design an Isolated Rectangular footing for an axial load of 1500 kN transmitted by the column. The cross section of the column is 230mm x 450mm. The SBC of soil is 180kN/m². Adopt M20 grade concrete and Fe415 grade steel. 14 M

7. Design a stair case for a three storied residential building.
The dimension of stair case room is 3.6m x 4.5m. The height of each storey is 3.6m. Adopt M20 grade concrete and Fe415 grade steel. 14 M