1135 **Code : 15CE51T**

Register Number | | | | | | | | | | |

V Semester Diploma Examination, Nov./Dec.-2018

DESIGN OF REINFORCED CEMENT CONCRETE

Time : 3 Hours | **| Max. Marks : 100**

Note : IS 456-2000 & SP16 is permitted in the examination.

PART – A

Answer any **5** questions. **5 × 5 = 25**

1. Differentiate between under reinforced section and Balanced section.
2. List the conditions under which doubly reinforced beams are preferred.
3. Differentiate between one way slab and two way slabs.
4. Differentiate between Uniaxial bending and Biaxial bending.
5. Define axially loaded and Eccentrically loaded column.
6. Explain the principles of pre-stressing.
7. Differentiate between pre-tensioning and post tensioning.
8. List the advantages of pre-stressed concrete.

PART – B

Answer any **five** questions, atleast **two** questions from each section. **5 × 15 = 75**

Section – I

9. A RC beam of rectangular section is 300 mm × 600 mm (overall) is reinforced with 4 – 25 mmϕ at an effective depth of 550 mm, the effective span of beam is 7 m, if fg = 415 MPa and fck = 20 MPa.
Find the safe udl the beam can carry.

10. A doubly reinforced beam 300 mm × 600 mm, simply supported at both ends with an effective error of 40 mm. The effective span is 6 m. The beam carries a superimposed service load of 45 kN/m. Use M25 concrete and Fe500 steel.
Calculate tension and compression reinforcement.

11. Determine the area of tensile reinforcement required in a flanged beam having the following sectional dimensions to support a factored moment of 300 kN.m.
Width of flange bf = 750 mm
Width of rib bw = 300 mm
Thickness of flange Df = 120 mm
Effective depth d = 600 mm
Use M20 grade concrete and Fe 415 grade steel.

Section – II

12. Design a singly reinforced concrete beam of clear span 5 m to support a design working live load of 10 kN/m. Take clear cover equal to 40 mm. Adopt M20 and Fe415 HYSD bars.
Design the beam for flexure. Sketch the reinforcement details.

13. Design a RCC slab for a room of clear dimension 4 m × 5 m. The slab is supported on walls of width 300 mm. The slab is carrying a live load of 3.5 kN/m^2 and floor finish of 1.5 kN/m^2.
Use M20 concrete and Fe415 steel. The corners of the slab are not held down.
Show the reinforcement arrangement.

14. Design the reinforcements in a rectangular column of size 300 mm × 500 mm to support a design a ultimate load of 500 kN together with a factored moment of 200 kN/m. Adopt the value of fck = 20 N/mm^2 and fy = 415 N/mm^2.
Assume effective cover = 50 mm
Sketch the details.

15. Design a dog legged stair for a building in which the vertical distance between the floor is 3.6 m. The stair hall measures 2.5 m × 5 m. The live load may be taken as 2.5 kN/m^2.
Use M20 and Fe415 HYSD bars. Sketch the reinforcement details.