

REINFORCED CEMENT CONCRETE STRUCTURES (RCC STRUCTURES)

Time : 2:30 Hours]

[Maximum Marks : 50

[Minimum Marks : 17

NOTE:

- Attempt all questions.
- Students are advised to specially check the Numerical Data of question paper in both versions. If there is any difference in Hindi Translation of any question, the students should answer the question according to the English version.
- Use of Paper and Mobile Phone by the students is not allowed.

Q1) Answer any two parts of the following :

[2 × 5 = 10]

- Explain basics of Limit state design?
- Write classifications of columns?
- Discuss steps followed for design of two-way simply supported slab?

Q2) Answer any two parts of the following :

[2 × 5 = 10]

- List methods of design of reinforced cement concrete sections? Explain briefly.
- What is the shear reinforcement in R.C.C. beams and how many types of Shear Reinforcement?
- Compare reinforced cement concrete with pre-stressed cement concrete?

Q3) Answer any two parts of the following :

[2 × 5 = 10]

- Find the moment of resistance for a T-beam with following data:
Effective flange width = 750 mm
Thickness of flange = 150 mm
Width of Rib (web) = 250 mm
Effective Depth of beam = 400 mm
Tensile Reinforcement = 4 bars of 16 mm ϕ
Use M20 concrete and Fe 415
- Determine the depth of neutral axis of a rectangular beam section 250 mm × 500 mm (total depth) is reinforced with 4 bars of 20 mm ϕ as tensile steel and 3 bars of 16 mm ϕ as compressive steel at an effective cover of both is 40 mm.
Use $m = 18$ & $f_{ck} = 25 \text{ N/mm}^2$
 $f_y = 415 \text{ N/mm}^2$
- A short axially loaded column of size 200 mm × 300 mm is reinforced with 4 bars of 20 mm ϕ . Calculate the load carrying capacity of column if :
a) M-15 & Fe 250 grades are used?
b) M-20 & Fe 415 grades are used?

Q4) Answer any two parts of the following :

[2 × 5 = 10]

- Write a note on reinforcement material used for reinforced cement concrete?
- Discuss design of Short column by Limit state method?
- Sketch neatly section of a T-beam and show all components?
- Write advantage of T-Beam construction?

Q5) Answer any two parts of the following :

[2 × 5 = 10]

- Write the advantages and disadvantages of pre-stressing?
- Explain the term deflection and lateral stability of beam?
- Define Development Length, Lateral Arm and depth of neutral axis?

(R1503)

