

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

SET B

**SCHOOL OF ENGINEERING
END TERM EXAMINATION - JAN 2024**

Semester : Semester V - 2021

Course Code : CIV3003

Course Name : Design of RCC Structural Elements

Program : B.Tech.

Date : 08-JAN-2024

Time : 9:30AM - 12:30 PM

Max Marks : 100

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS

4 X 5M = 20M

1. What are partial safety factor for material and loads?
(CO1) [Knowledge]
2. Draw the design stress strain curve for concrete.
(CO1) [Knowledge]
3. Draw the stress-block diagram for Reinforced Cement Concrete.
(CO1) [Knowledge]
4. Define creep, shrinkage and durability.
(CO1) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

5 X 10M = 50M

5. Discuss the different methods of reinforced cement concrete design.
(CO1) [Comprehension]
6. What are the different types of shear cracks formed on a beam section? Explain with neat sketch.
(CO1) [Comprehension]
7. An RC beam, 300mm wide is reinforced with 1436 mm^2 of Fe415 HYSD bars at an effective depth of 500mm. If M20 grade concrete is used, estimate the moment of resistance of the section.
(CO2) [Comprehension]

8. An RC beam 250 x 550mm is reinforced with 4 bars of 25 mm diameter bars of Fe 415 grade steel. Effective cover is 50 mm and M20 concrete is used. It is provided with 2-legged 8 mm stirrups at a spacing of 150 mm. Analyse the beam section for its ultimate shear strength.
(CO2) [Comprehension]
9. Design the longitudinal reinforcement in a rectangular reinforced concrete column of size 300mm x 600mm subjected to a factored load of 1600kN and a factored moment of 280kNm with respect to the major axis. Assume M25 concrete and Fe500 steel.
(CO3) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

2 X 15M = 30M

10. Design a simply supported reinforced concrete beam for the following data:
Effective span = 4m
Width of supports = 300mm
Live Load = 5kN/m
M20 grade concrete and Fe415 HYSD bars
Also design the shear reinforcement.
(CO2) [Application]
11. Design a simply supported RCC slab, for a room having clear dimensions, 3.5m by 4.5m. Adopt M25 grade concrete and Fe415 HYSD bars. Take floor finish = $0.6kN/m^2$ and live load = $4kN/m^2$
(CO3) [Application]