R20 Regulation *Subject code:3P5AC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Supplementary Examinations, November 2025

DESIGN OF REINFORCED CEMENT CONCRETE STRUCTURES

(CE)

Maximum Marks: 70 Date: 22.11.2025 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	List the advantages of flanged beams.	2M	1	L1
2	What is meant by balanced section?	2M	1	L1
3	Write about Torsional Shear.	2M	2	L1
4	Define anchorage.	2M	2	L1
5	According to IS code all the columns shall be designed for minimum eccentricity. Justify the reasons for this statement.	2M	3	L1
6	Write the importance of column curves.	2M	3	L1
7	Write the various types of slab.	2M	4	L1
8	Write the different types of staircases.	2M	4	L1
9	Write about eccentric loading on a footing.	2M	5	L1
10	Compare one way footing and two way footing in foundation.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	Differentiate between working stress method and limit state method.	10M	1	L2
	OR			
12	Design the flexural reinforcement for the beam having size 250mm x 400mm and is carrying load of 15KN/m including self weight with span of 4.5m. Adopt M20 and Fe 415 and the beam is subjected to moderate exposure conditions.	10M	1	L2
13	What is meant by full development length? What is its approximate value for tensionand compression in terms of the diameter of the bar?	10M	2	L2
	OR			
14	Determine the moment of resistance of a T-beam for the given below data: Effective width of flange=2500mm,Depth of flange=150mm Width of rib=300mm, Effective depth=800mm Area of steel: 6 bars of 25mm diameterMaterials: M-20 grade concrete Fe-415 HYSD bars.	10M	2	L2

15	A reinforced concrete column 400 mm x 400 mm supports an axial service load of 1200 kN. The safe bearing capacity of the soil at site is 200 kN/m^2. Adopting M25 grade concrete and Fe415 HYSD bars design a suitable footing for the column and sketch the details of reinforcement.	10M	3	L2
	OR		3	L2
16	Design a continuous slab 8 m x 16 m resting on 250 mm wide monolithic casted beams that are spacing at 4 m center to center and arranged in short span direction. Assume the super imposed load 5 kN/m^2 and use concrete M25, steel Fe415.	10M	4	L2
17	Design a reinforced concrete footing for a rectangular column of section400mm x 600mm supporting an axial factored load of 2000 kN. Thesafe bearing capacity of the soil is 300 kN/m^2. Adopt M20 grade of concrete and Fe-415 HYSD bars. Sketch the details.	10M	4	L2
	OR			
18	Design an isolated square footing to carry column load 600 kN and moment 30 kN-m respectively. Assume safe bearing capacity of soil 120 kN/m^2 . Use M25 and Fe415. Apply relevant design checks for strength and serviceability conditions. (Use Limit State Method). Neatly sketch the footing section and detail the reinforcement and connection between the column and footing.	10M	4	L2
19	A reinforced concrete column 600 mm x 600 mm supports an axial service load of 800 kN. The safe bearing capacity of the soil at site is 150 kN/m^2. Adopting M20 grade concrete and Fe415 HYSD bars design a suitable footing for the column and sketch the details of reinforcement.	10M	5	L2
	OR			
20	Design a single flight stair case slab to cover a horizontal span of 4.5 m if the total vertical rise is 3.6 m. There are total 18 steps to rise. The tread is 250 mm. Take live load as 3 kN/m^2 . Use M25 concrete and Fe 415 steel.	10M	5	L2