



R18 Regulation

Subject code:2P5AB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, December 2024

DESIGN OF REINFORCED CEMENT CONCRETE STRUCTURES (Civil Engineering)

Maximum Marks: 70

Date:28.12.2024

Duration: 3 hours

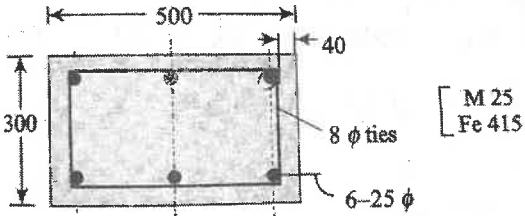
- Note:
- 1.This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.
 - 5.IS:456-2000 CODE BOOK IS ALLOWED

Part-A

All the following questions carry equal marks (10X2M=20) Marks)		CO	Bloom Tx
1	Draw the material stress-strain curves	1	L1
2	Distinguish between balanced section, under reinforced section and over reinforced section.	1	L1
3	State the maximum and minimum requirement of reinforcement for beams in compression.	2	L1
4	Define shear and torsion	2	L1
5	What is short column and long column?	3	L1
6	Write about slenderness ratio	3	L1
7	Express one way slab and two way slab.	4	L1
8	What is stair case? Mention any 2 types of stair cases.	4	L1
9	What is footing? Mention what are the 3 types of footings.	5	L1
10	What is pile cap?	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	Explain about working stress method and limit state method. [10M]	1	L1
OR			
12	An RCC rectangular beam is reinforced on tension side is 250 mm wide and 450 mm effective depth reinforced with 4 bars of 18 mm diameter. Calculate the moment of resistance by limit state method. Use M15 concrete and mild steel (Fe250). [10M]	1	L3
13	Discuss the concept of Bond, anchorage and development length. [10M]	2	L1
OR			
14	Write about design of canopy in detail. [10M]	2	L1
15	Design the reinforcement in a column of size 450 mm X 600 mm, subject to an axial load of 2000 kN under service dead and live loads. The column has an unsupported length of 3 m and is braced against sideway in both directions. Use M20 concrete and Fe415 steel. [10M]	3	L3

	OR		
16	For a column section shown in below figure. Construct the design interaction curve for axial compression combined with uniaxial bending about the major axis. Hence, investigate the safety of the column section under the following factored load effects: [10M]  (i) $P_u = 2275 \text{ kN}$, $M_{ux} = 46.4 \text{ kN-m}$ (maximum axial compression) (ii) $P_u = 1105 \text{ kN}$, $M_{ux} = 125 \text{ kN-m}$ (maximum eccentricity).	3	L3
17	Design a simply supported slab to cover a room with internal dimensions of 4 m X 5 m and 230 mm thick brick walls all around. Assume a live load of 3 kN/m² and finish load of 1 kN/m². Use M20 concrete and Fe415 steel. Assume that slab corners are free to lift up. Assume mild exposure conditions. [10M]	4	L3
	OR		
18	A straight staircase is made of structurally independent tread slabs, cantilevered from a reinforced concrete wall. Given that the riser is 150 mm, tread is 300 mm and width of flight is 1.5 m, Design a typical tread slab. Apply the live loads specified IS loading Code for stairs liable to be over crowded. Use M20 concrete and Fe250 steel. Assume mild exposure conditions. [10M]	4	L3
19	Design an isolated square RCC footing of uniform thickness for a square RCC column of 400 mm X 400 mm, carrying a load of 900 kN. Use M15 and Fe415 grades respectively. [10M]	5	L3
	OR		
20	Explain different types of footings with neat sketch [10M]	5	L1