R18 Regulation *Subject code: 2P5AB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, July 2024

DESIGN OF REINFORCED CEMENT CONCRETE STRUCTURES

(CE)

Maximum Marks: 70 Date:22.07.2024 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.

IS 456-2000 CODE BOOK IS ALLOWED.

	Part-A		
All the following questions carry equal marks (10X2M=20 Marks)		CO	Bloom Tx
1	What is the limit state method of design?	1	L1
2	What are the parameters affecting the shear strength of an RCC beam section?	1	L1
3	Explain how the shear reinforcement improves the strength of beam.	2	L1
4	What is canopy?	2	L1
5	List the various types of RCC columns. Explain about lateral ties design as per IS code.	3	L1
6	Specify the minimum percentage reinforcement provided in a column when (a) Mild steel is used (b) HYSD steel is used	3	L1
7	Design a simply supported one way slab of effective span 2.5 m to carry a total load of 4 kN/m. Use M20 and Fe415 grades respectively.	4	L1
8	Draw load distribution diagram for one way and two way slab.	4	L1
9	Draw pressure distribution diagram for (a) sandy soil (b) claye soil	5	L1
10	Determine the minimum depth of foundation by Rankin's formula.	5	L1
	Part-B		
Answer All the following questions. (5X10M=50Marks)			
11	Explain about material stress-strain curve in brief. [10]	1	L2
	OR		
12	Design a singly reinforced concrete beam to resist a characteristic BM of 130 kN–m using M15 concrete and mild steel. Keep the breadth of beam equal to half its effective depth. The concrete is coastal environment, use limit state method. [10]	1	L2
13	Write about philosophy of limit state of design. [10]	2	L2
	OR		
14	Write about design of canopy. [10]	2	L2

15	A corner column of 400 mm X 400 mm is located in the lowermost storey of a system of braced frames, is subjected to factored loads: P_u=1300 kN, M_{ux}=190 kN-m and M_{uy}= 110 kN-m. The unsupported length of the column is 3.5m. Design the reinforcement in the column, assuming M25 concrete and Fe415 steel. [10]	3	L2
	OR		
16	Draw interaction diagram and explain about it.	3	L2
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/m^2 and finish load of 1 kN/m^2. Use M20 concrete and Fe415 steel. Assume that slab corners are free to lift up. Assume mild exposure conditions. [10]	4	L2
	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. [10]	4	L2
19	Design an isolated square RCC footing of uniform thickness for a square RCC column 400 mm X 400 mm, carrying a load of 900 kN. Use M15 and Fe415 grades respectively. [10]	5	L2
	OR		
20	Design a suitable pile cap for a reinforced concrete column of size 500 mm X 500 mm, reinforced with 8-25 dia. Bars, carrying a factored axial load of 4000 kN, supported by four symmetrically placed piles, 300 mm dia., spaced at 1.2 m in both x- and y- directions. The pile location tolerance may be taken as 50mm. The column and piles are with M30 concrete and use M25 concrete for the pile cap. Use Fe415 steel. [10]	5	L2