



R20 Regulation

Subject code:3P5AC

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:31.12.2024

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.

Part-A

All the following questions carry equal marks (10X2M=20) Marks)		CO	Bloom Tx
1	Write about serviceability in limit state?	1	L1
2	Differentiate between under reinforced and over reinforced beam.	1	L1
3	Write about primary and secondary torsion with examples	2	L1
4	What is short and long column.	2	L1
5	Write the minimum number of steel rods for different types of columns.	3	L1
6	Write the advantages of helical reinforced columns?	3	L1
7	Distinguish between the behavior of one way and two way slabs	4	L1
8	Write the different types of staircase	4	L1
9	Draw a neat sketch of a masonry footing.	5	L1
10	Under What conditions we go for combined footing.	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	Explain the basic concept behind reinforced cement concrete and compactability of steel to concrete [10M]	1	L2
OR			
12	A rectangular RC section having a width of 350mm is reinforced with 2 Nos of 28 mm dia. bars at an effective depth of 550mm. Use M20 concrete and Fe 415 steel. Determine the ultimate moment of resistance of the section. [10M]	1	L2
13	Determine the moment of resistance of a tee-beam having the following section properties: Effective width of flange=2500mm, Depth of flange=150mm Width of rib=300mm, Effective depth=800mm, Area of steel:6 bars of 25mm diameter Materials:M-20 grade concrete, Fe-415 HYSD bars. [10M]	2	L2
OR			

14	Design a singly reinforced beam of effective span 5.3 m carrying load of 10 kN/m (including self weight). Take grade of concrete and steel as M20 and Fe415. Assume if any data required. [10M]	2	L2
15	Find the maximum moment carried about major and minor axis of a column 250 mm x 400 mm size fixed at bottom and carry axial load 250 kN. Assume the column provided with reinforcement 4nos 20 mm dia bars in tension side and 2nos 20 mm dia bars in compression side. Use clear cover 40 mm and steel Fe415, M20 grade concrete. [10M]	3	L2
	OR		
16	Design an axially loaded tied column with an unsupported length of 3 m. The column is fixed at one end and pinned at the other end. It carries a factored load of 2200KN. Use M25 and Fe 415. Sketch the reinforcement details. [10M]	3	L2
17	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 3000 N/m ² . Use M25 concrete and Fe 415 steel. [10M]	4	L2
	OR		
18	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 10 kN/m ² and use concrete M25, steel Fe415. [10M]	4	L2
19	A rectangular RCC column of size 400 mm x 600 mm carrying an axial load of 1800KN. Safe bearing capacity of soil is 150kN/m ² . Design a suitable footing. Adopt M25 concrete and Fe 415 steel. [10M]	5	L2
	OR		
20	Design a circular footing for circular column of 500 mm diameter subjected with service load of 1200KN. Use M25 and Fe 415. Take SBC of soil as 200kN/m ² . [10M]	5	L2