Regulation R18 *Subject code: 2P5AB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, June/July 2023

DESIGN OF REINCORCED CEMENT CONCRETE STRUCTURES

(CIVIL ENGINEERING)

Maximum Marks: 70 Date:26.06.2023 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)

1 Write about working stress method.
2 Distinguish between under reinforced section and over reinforced section.
3 Define bond stress.
4 State the maximum and minimum requirement of reinforcement for beams in tension.
5 What is short column and long column?
6 Draw interaction diagram.
7 List out the differences between one way slab and two way slab.
8 What is stair case?
9 Write the requirements of a foundation system for a structure?
10 Draw pile cap.

Part-B

Answer All the following questions. (5X10M=50Marks)

11 Draw material stress strain curves and write safety factors of limit states. [10]

OR

12 An RCC rectangular beam is side is 250 mm wide and 450 mm effective depth reinforced on tension with 4 bars of 18 mm diameter. Calculate the moment of resistance by limit state method. Use M15 concrete and mild steel (Fe250). [10]

13 Discuss the philosophy of limit state of design. [10]

OR

14 Explain design of canopy in detail. [10]

15 Design a short column using M15 grade of concrete and mild steel reinforcement to carry an axial load of 800 kN by using limit state method. [10]

OR

16 Find the safe load on a short circular column of 400 mm diameter and 4 m long. The column is reinforced with 6 longitudinal bars of 16 mm dia. The column having lateral ties. The column is effectively held in position at both ends, but not restrained against rotation. Use M20 grade of concrete and Fe415 grade of steel. [10]

17 Design a slab for a residential building of size 4.2 m X 5.8 m (eff. spans). Slab is simply supported on all 4 sides on 230 mm thick wall. The corners of slab are prevented from lifting. Imposed load is 3 kN/m^2, FF = 1 kN/m^2. Use M25 and Fe415 respectively. [10]

OR

18 A straight stair in a residential building is supported on wall on one side and stringer beam on the other side. The risers are 200 mm and treads are 300 mm. the horizontal effective span of the stairs is 1.30 m. Design the stairs, use M15 and mild steel. [10]

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. [10]

OR

20 Design an isolated rectangular RCC footing of uniform thickness for a rectangular RCC column 500 mm X 350 mm, carrying a load of 1000 kN. Use M15 and Fe415 grades respectively. [10]

Note : IS456 Code book allowed.