



Regulation R18

Subject code: 2P5AB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, January 2023

DESIGN OF REINFORCED CEMENT CONCRETE STRUCTURES (CIVIL ENGINEERING)

Maximum Marks: 70

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.

Note: IS456-2000 CODE BOOKS ARE ALLOWED FOR EXAMINATION.

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 What are the different limit states considered in the design of RCC structures?
- 2 A T-beam roof section has of thickness of slab is 100 mm, width of rib is 230 mm, overall depth of beam is 350 mm, c/c distance of beams is 4 m, effective simply supported span of beams is 6 m. Find effective flange width.
- 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 What is pile cap?
- 7 List out any two differences between one way slab and two-way slab.
- 8 What is stair case?
- 9 Write any three main requirements of a foundation system for a structure?
- 10 What is footing?

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Explain the stress-strain curves for the concrete and steel material. [10]
OR
- 12 Design a singly reinforced concrete beam of clear span of 5m to support design working live load of 10kN/m. Adopt M20 and Fe415 grades. [10]
- 13 Write about philosophy of limit state of design. [10]
OR
- 14 A Reinforced concrete cantilever beam of rectangular section 300 mm wide by 600 mm deep is built into a column 500 mm wide. The cantilever beam is subjected to a hogging moment of 200 KN-m at the function of beam and column design suitable reinforcement in the beam and check for required anchorage length. Adopt M20 grade of concrete and Fe415 HYSD bars. [10]
- 15 State and sketch the reinforcement details of columns. [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 carries 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 Design a dog legged stair case for a building in which the height of floor is 3 m. Adopt a rise of 15 cm. The stair hall measures 2.5 m X 4.5 m. LL is 3 kN/m^2 . Use M20 and Fe415 respectively. [10]
- 19 What is footing? Write different types of footings and draw their sketch. [10]
- OR
- 20 Explain in brief about pile cap and draw its sketch. [10]