



R18 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code: 2P5AB

B.Tech V Semester Regular Examinations, February 2021

DESIGN OF REINFORCED CEMENT CONCRETE STRUCTURES

(Civil Engineering)

Maximum Marks: 70

Date: 19.02.2021 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.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

5. Use IS 456-2000 & SP-16 Code books are allowed

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 Write any two advantages of limit state method over working stress method.?
- 2 What is partial safety factor?
- 3 Define bond and anchorage?
- 4 List the functions of longitudinal reinforcement with respect to torsion.
- 5 Name any two methods for design of long columns
- 6 Define buckling and crippling in column failure
- 7 What is the advantage of two way slab over one way slab?
- 8 Mention the codal provisions for minimum reinforcement to be provided as primary and secondary reinforcement in RC slabs ?
- 9 What is meant by eccentric loading on a footing?
- 10 What is the main advantage of combined footing?

Part-B

Answer All the following questions.

(10M X 5=50Marks)

- 11 Design a singly reinforced beam to carry a load of 15000 N/m. The clear span of the beam is 5.5 m. The bearing at each end is 300mm. Use M 20 concrete and Fe 415 steel. Use limit state method. (10M)

OR

- 12 Design a doubly reinforced beam to carry a super imposed load of 60 kN/m. The overall depth and width of the beam are restricted to 840 mm and 300 mm respectively. The beam has a clear span of 5m and bearing of 50 cm on each end. Use M15 Grade of concrete and Fe 415 steel. (10M)

- 13 Design the shear reinforcement for a beam 180 mm x 800 mm effective depth subjected to 15 kN/m. The span of the beam is 5 m. Take tensile reinforcement at a section is 1.2%. (10M)

OR

- 14 Design the reinforcement required for the section 300 mm x 500 mm for the following data : Bending moment = 65 kNm, Torsional moment = 40 kNm, Shear force = 70 kN.

- 15 Design a short column to carry an axial load of 1200 kN and. moment of 60 kNm about the major axis. The effective height of column is 3 m. (10M)

OR

- 16 Design the reinforcement for a column of size 250mm x 300mm if it is subjected to a $P_u = 500\text{kN}$, $M_{ux} = 50\text{kN.m}$ and $M_{uy} = 30\text{kN.m}$. Provide effective cover of 50mm. (10M)

- 17 Design the roof slab for a Hall of size 4m x 10m by limit state method using M20 concrete and Fe415 steel. The slab is simply resting on 230mm thick brick walls all around. Take the live load on the slab as 1.5kN/m^2 and finish load as 2.25kN/m^2 . (10M)

OR

- 18 Design a simply supported RC slab for a roof of a hall 4mx4m (inside dimensions) with 230mm walls all around. Assume a live load of 4kN/m^2 and floor finishes 1kN/m^2 . Use M-20 grade concrete and Fe 415 grade HYSD steel bars. (10M)

- 19 Design a rectangular footing for a column 300mm x 300mm to transfer a axial load of 800KN. Safe bearing capacity of soil is 140kN/m^2 . (10M)

OR

- 20 Design a combined footing for two columns 250mm x 250mm ,3m apart to transfer a axial load of 1400kN each. The width is restricted to 2m.The safe bearing capacity of soil is 250kN/m^2 . (10M)