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B.Tech. (Civil) 4th Semester (G-Scheme)

Examination, July-2022

DESIGN OF CONCRETE STRUCTURE

Paper- PCC-(CE-204-G)

Time allowed : 3 hours]

[Maximum marks : 75

Note : Question No. 1 is compulsory.

1. (a) Differentiate between Limit State and Working Stress Methods. 5×3=15
(2)
- (b) Write down the assumptions made in RC member subjected to bending.
(2)
- (c) Describe the unbalanced sections.
(2)
- (d) Write the equations of N.A. of flanged beam.
(2)
- (e) Write down all the effective lengths of compression members.
(2)

Section - A

2. Draw and explain the stress-strain relationship of steel and concrete in details. 15
(12)
3. Design a rectangular beam section for an ultimate moment of 150kNm. Use M20 concrete and Fe 415 steel. Assume suitable data. 15

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[P. T. O.]

Section - B

4. A simply supported reinforced concrete beam is 250mm wide, 500mm effective depth and is reinforced with 5 bars of 18mm diameter as tensile steel. If the beam is subjected to a factored shear of 140 kN at the support and two of the main bars are cranked up at 45° , find the spacing of 2-legged 6mm diameter stirrups at support. Use M 20 concrete and Fe 415 steel. 15

5. Describe the deflection and moment relationship for limiting values of span to depth. 15

Section - C

6. Describe the steps to be followed in the design of a one way slab. 15
7. Design a reinforced concrete cantilever type retaining wall having a 5m tall stem. The wall retains soil level with its top, the soil weighs 18000 N/m^3 and has an angle of repose of 30° . The safe bearing capacity of the soil is 200 kN/m^2 . Use M20 concrete and Fe 415 steel. 15

8. A reinforced concrete column carries an axial load of 1500 kN using M20 concrete and Fe 415 steel. The column has a diameter of 150mm.
9. A square column carries an axial load of 1500 kN using M20 concrete and Fe 415 steel. The column has a side length of 150mm.

(3)

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Section - D

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8. A reinforced concrete column of 2.75m effective length carries an axial load of 1600 kN. Design the column using M20 concrete and Fe 415 steel. 15

9. A square column 400mm × 400mm carries an axial load of 1500 kN. Design the column and a square footing for the column. The safe bearing capacity of the soil is 150mm². Use M20 concrete and Fe 250 steel. 15

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