Code No: **R1631014** **R16** SET - 1

III B. Tech I Semester Supplementary Examinations, August - 2021

DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES

(Civil Engineering)

Time: 3 hours Max. Marks: 70

Answer any ONE Question from Part–A & any THREE Questions from Part–B
(IS 456 -2000 & column interaction diagrams only from SP–16 are to be provided to the student in the Examination hall).

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PART –A **(28 Marks)**

1. Design a simply supported RC slab for a room 4.5m x 5m measuring from inside, assuming that the corners are not free to lift. The thickness of wall is 400 mm. The live on the floor is 2 kN/m^2. The floor carries a floor finish which weighs 8.5 kN/m^2. Use M20 mix and Fe 415 steel. [28M]

(OR)

2. Design a trapezoidal footing for two columns A, 500mm x 500mm, and B, 600 mm x 600mm, and axial load on A is 500 kN and axial load on B is 900kN. The distance between centres of columns is 2.6 m. The safe bearing capacity of soil may be taken as 200 kN/m^2. The footing is not to project more than 0.5m beyond the outer face of the columns. Use M20 concrete and FE 415 steel. Draw the reinforcement details. [28M]

PART –B **(42 Marks)**

3. A reinforced concrete beam of rectangular section 300 mm wide by 550 mm deep is reinforced with 2 bars of 12 mm diameter at an effective depth 550 mm. The section is subjected to a service load moment of 40 kNm. Assuming M20 grade concrete and Fe 415 HYSD, estimate the stresses in concrete and steel. [14M]

4. Derive the moment of resistance equations of flanged sections when NA lies outside the flange. Explain with figures. [14M]

5. Write the steps involved in the design Limit state of collapse-Shear and Torsion. [14M]

6. Design a short column to carry a working load of 1200 kN and a uniaxial moment of 300 kN. Use M20 grade and Fe 415 steel. [14M]

7. A short reinforced concrete rectangular column of size 300 mm by 500mm subjected to a design factored load of 1000 kN and a factored moment of 250 kNm about the major axis. Use M 25 grade concrete and Fe 45 steel. [14M]

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