

Roll No.

3081

**B. Tech. 4th Semester (Civil)
Examination – July, 2021**

DESIGN OF CONCRETE STRUCTURE

Paper : PCC-CE-204-G

Time : Three Hours] [Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. **1** is *compulsory*.
All questions carry equal marks.

1. (a) A $300 \text{ mm} \times 300 \text{ mm}$ R.C. member reinforced with 1257 mm^2 steel supports an axial compressive load of 440 kN . Calculate the stresses in concrete and steel. Take $m = 13.33$.
- (b) Make an expression for moment of resistance of R. C. beam section.

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- (c) Explain the effect of shear stresses on R. C. members.
- (d) Describe direct bond.
- (e) Write the effective width of flange of a T-beam.

$$3 \times 5 = 15$$

SECTION – A

- 2. Explain WSM and LSM. How working stress method is differ from limit state method ? 15
- 3. A beam of rectangular section is 200 mm wide and 300 mm deep to the centre of tensile reinforcement. It has to carry a dead load of 8.5 kN/m and a live load of 7.5 kN/m. Find the steel required for mid span section. The beam has a span of 5 m. Use M20 concrete and Fe 415 steel. Effective cover to compression steel is 40 mm. 15

SECTION – B

- 4. Write short note on : 5 × 3 = 15
 - (a) Requirements of good detailing.
 - (b) Anchoring bars in flexure and shear.
 - (c) Anchorage and flexural bond.

- 5. Explain in detail about the control of deflection, cracking and vibrations. 15

SECTION – C

- 6. Design a slab over a room 4 m × 6 m as per I. S. code. The edges of the slab are simply supported and the corners are not held down. The live load on the slab is 3000 N/m². The slab has a bearing of 150 mm on the supporting walls. Use M 20 concrete and Fe 415 steel. 15
- 7. Describe the steps to be followed in the design of a cantilever retaining wall. 15

SECTION – D

- 8. A reinforced concrete column of 3 m effective length carries an axial load of 1800 kN. Design the column using M 20 concrete and Fe 415 steel. 15
- 9. Write down the step by step design procedure of combined footing. 15