

SECTION-B

2. Discuss step-wise the IS code Method of Mix Design of Concrete.
3. What is Workability of Concrete? How is it evaluated in concrete?
4. What are the Various Design Philosophies followed for Reinforced Concrete?
5. Calculate the moment of resistance and uniformly distributed load which a Simply Supported beam of effective span 5 meters can carry if the cross section details are 250×550 effective depth and 600 mm overall depth. It is reinforced with three bars of 20 mm diameter in the compression zone and 4 bars of 25 mm diameter in the tension zone. Use the effective cover to compression reinforcement as 50 mm. Use M20 concrete and Fe 415 steel.
6. A simply supported beam is 25 cm by 50 cm and has 2-20mm dia TOR steel bars going into the support. If the shear force at the centre of support is 150kN at working loads, determine the anchorage length. Assume M20 and Fe415 steel.

SECTION-C

7. Calculate the amount of steel required in a T-Beam to develop a moment of resistance of 300 kNm at working loads. The dimensions of the section are given as : $D_f = 120\text{mm}$, $b_f = 750\text{mm}$, $b_w = 200\text{mm}$, $D = 600\text{mm}$, cover to tension reinforcement = 50 mm and cover to compression reinforcement = 50 mm.
8. Design the support section of a ring beam 400 mm wide and 800 mm deep subjected to a bending moment of 150 kN-m, twisting moment of 25 kNm and a shear force of 200 kN at Ultimate. Use M20 and Fe415 steel.
9. Design a simply supported roof slab for a room $8 \text{ m} \times 3 \text{ m}$ clear in size if the superimposed load is 4.5kN/m^2 . Use M 20 and Fe 415 grade steel.