

Question Bank on Design of concrete structures

Answer the following questions. Each question carries 2 marks
 $2 \times 10 = 20$

Chapter- LSM and WSM

1. Explain the stress-strain relationship for mild steel.
2. Explain the Modulus of elasticity of concrete.
3. Write a short note on different kinds of loads to be taken into account for the design of RCC structures.
4. Differentiate between WSM and LSM.

Chapter- Shear, Bond and Development length, Column and Footing

5. What is hydration of cement. On which factors the rate of hydration depends?
6. What do you mean by Shear Stress in beam.
7. What is anchorage bond in Concrete. write the formula to express it?
8. What do you mean by development length in reinforced concrete.
9. What do you mean by Long Column & Short Column.
10. Write short notes on RCC & PCC.

Each of the following question carries 5 marks

$$8 \times 5 = 40$$

Chapter- Limit State Method, Design of Slab, Footings

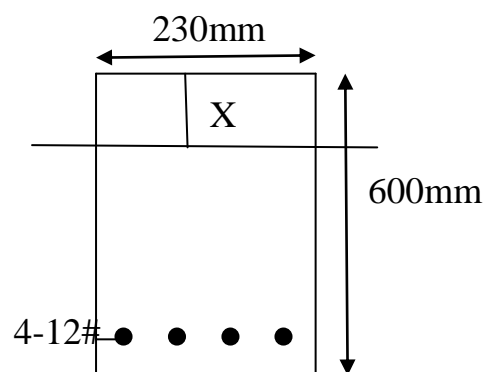
1. What is a balanced section, under reinforced section & Over reinforced section.
2. What is the necessity of doubly reinforced beam in RCC.
3. Find out the values of design constant k & j value for balanced section in working stress method, take M20 & Fe415 grade of concrete and steel.
4. Define single reinforced & double reinforced beams with sketch.
5. What are the assumptions prescribed by the code for limit state of collapse-compression
6. What is footing. Write down different types of footing.
7. Differentiate between one-way slab and two-way slab.
8. Write briefly the assumption of working stress method.

Each of the following question carries 10 marks

$$9 \times 10 = 90$$

Chapter-Design philosophy of LSM and WSM

1. Determine the position of the Neutral Axis of a reinforced concrete beam 250mm wide and 450mm effective depth if the stress developed in the concrete and steel are 6.4N/mm^2 and 230N/mm^2 respectively. M20 & Fe415 are the grade of concrete and steel.
2. A simply supported beam of size 230mm x 600mm (Fig-I) overall depth is reinforced with 4nos of 12mm diameter bar. Find the safe UDL on the beam in addition to its self weight on a span of 4mt. The materials are M20 grade of concrete and HYSD reinforcement of grade Fe415.



Chapter-Design of axially loaded column

3. A column with size 400mm x 500mm carries a factored axial load of 3000kN. The column is short and having a minimum eccentricity i.e. $e_{min} < 0.05D$. Design the column. The materials are M20 grade of concrete and HYSD reinforcement of grade Fe415.

Chapter- Analysis of singly/Doubly Reinforced section

4. A simply supported rectangular beam of 4 mt span carries an UDL of 26 kN/m. The width of the beam is 230mm. Find the depth and steel area for balanced design. Use M20 grade of concrete and mild steel reinforcement.
5. A simply supported rectangular beam of 4 m span carries a uniformly distributed characteristic load including self-weight of 20 kN/m. The beam section is 230mm x 450 mm overall. Design the beam. The materials are grade M20 concrete and HYSD reinforcement of grade 415.
6. Design a simply supported rectangular beam of size 230mm x 600mm for a super imposed load of 46 kN/m. Span of the beam is 5 m. The material are M20 grade concrete and HYSD reinforcement of the grade Fe 415.

Chapter- Analysis and Design of Slab and Stair case

7. A simply supported one way slab of effective span 4 m is supported on masonry walls of 230 mm thickness. Design the slab. Take live load equal to 2.5 kN/m² and floor finish equal to 1kN/m². The materials are M20 grade concrete and HYSD reinforcement of grade Fe 415.

Chapter-Design of axial loaded columns and Footings,Design of Tee-Beam

8. A short R.C.C column is to carry a factored load of 1900 kN. If the column is to be a square, design the column. Assume $e_{min} < 0.05D$. The material are M20 grade concrete
9. A tee beam section having 230 mm width of web \times 460 mm effective depth is reinforced with 5 no. of 16 mm dia. Bars as tension reinforcement, which continue for a distance greater than effective depth. The section is subjected to a factored shear of 52.5 kN. Check the shear stresses and design the shear reinforcement. The materials are M20 grade concrete and HYSD reinforcement of grade Fe 415. For stirrups mild steel bars may be used.
