Design and Drawing of Reinforced concrete structures

III-I B.Tech | Tutorial Sheet – 1 | AY 2019-20

28-06-19

1. Write short note on different philosophies in design of Reinforced concrete? Write the difference between singly and doubly reinforced sections?
2. What are the assumptions made in design of a reinforced concrete section for limit state of collapse in bending ? Derive the stress block parameters for a rectangular cross-section?
3. A rectangular section beam is 300 mm wide and 500 mm deep up to the centre of reinforcement which consist of 4-16 mm diameter bars of HYSD steel. Find the position of neutral axes, lever arm, force of tension and compression, moment of resistance of section. Use M20 grade concrete and Fe415 grade steel?
4. Design a rectangular RC section to resist a working bending moment of 30 kN-m. Use M20 concrete and Fe415 steel?
5. A RC beam 250 mm x 500 mm overall is reinforced with 4-20 mm diameter bars at the bottom with a clear cover of 25 mm. If effective span of the beam is 4 m. Find the amount of safe concentrated load that the beam can support at its mid span in additional to its self-weight. Use M20 concrete and Fe4155 steel ?
6. A rectangular beam 250 mm wide and 600 mm effective depth is reinforced with 3-16 mm diameter bars as compression reinforcement at a clear cover of 25 mm and 4-20 mm diameter bars as tension reinforcement at a clear cover of 30 mm. Calculate the moment of resistance of the section. Use M20 grade concrete and Fe415 grade steel?
7. A cantilever beam of 4 m span carries an UDL of intensity 10 kN/m inclusive of its self weight and having cross section 280 mm x 450 mm. Design the beam with neat detailing. Adopt M25 grade concrete and Fe415 steel?
8. 8. Derive the stress block parameters for an RC rectangular beam section using limit state method of design?