T.E.(Civil Engineering)

DESIGN OF RC STRUCTURES

(2019Pattern) (Semester-VI)

1. Explain working stress method and limit state method
2. Design dog-legged stairs for an office building in a room measuring 2.5m x 6.6m clear. The vertical distance between the floors is 3.5 m. Width of the flight is to be 1.25 m. Allow a live load of 3 kN/m². Sketch the details of the reinforcements. Use M20 concrete and Fe 415 steel. Assume the stairs are supported on 240 mm walls at the end of the outer edges of landing slabs.
3. Write short note on dog legged and open well staircase.
4. Design a rectangular beam of section 250 mm x 650 mm of effective span 6 m. Effective cover for reinforcement should be kept 60 mm. Imposed load on the beam is 40 kN/m. Use M20 concrete and Fe 415 steel.
5. Explain design of short column for axial load.
6. A Rectangular beam is to be simply supported on supports of 230 mm width. The clear span of the beam 6 m. The beam is to have width of 300 mm. The characteristic superimposed load is 12 kN/m. Using M20 concrete and Fe 425steel design the beam.
7. Design a rectangular beam of section 230 mm x 600 mm of effective span 6 m. Effective cover for reinforcement should be kept 60 mm. Imposed load on the beam is 20 kN/m. Use M20 concrete and Fe 415 steel
8. Design a continuous rectangular beam of spans 7 m to carry a dead load of 14kN/m and a 20 kN/m. The beam is continuous over more than 3 spans and is supported by columns. Use M 20 concrete and Fe 415 steel
9. A cantilever beam projects 2.5 m beyond the fixed end and carries a superimposed load of 20 kN/m. Design the cantilever use M 20 and Fe 415. Use LSM.
10. Calculate the area of steel required for a short column 400 mm x 450 mm in cross-section to carry an axialload of 1160 kN. Assume concrete grade M20 and steel Fe 250. Given: fck = 20 N/mm², fy = 250 N/mm², b = 400 mm,D = 450 mm, P = 1160 kN. Required Asc