8. Unit Wise Question Bank

UNIT-I

1. Find the moment of Resistance of T beam having the following data
   B_f=780mm, d=400mm, b_w=240mm, A_{st}=6-16mm dia mild steel, D_f=150mm, use M20 concrete.

2. A concrete beam has 230mm breadth and 500mm effective depth. Design the beam if it is subjected to a super imposed bending moment of 250kNm. Use M20 and Fe 500.

3. A beam section 300mm wide and 500mm deep is reinforced with a tension reinforcement of 2800mm^2 at an effective cover of 300mm. Determine the ultimate moment of resistance of beam section. Use M20 concrete and Fe 415.

4. Find the moment of resistance of a T beam having the following data B_f=800mm, d=400mm, b_w=200mm, A_{st}=3800mm^2, D_f=100mm, use M20 and Fe 415.

5. Design a balanced singly reinforced concrete beam section for an applied moment of 60kNm. The width of the beam is limited to 200mm. use M25and Fe415 bars.

6. What are the advantages of T beam, Explain in brief?

7. Derive the Stress block parameters of reinforced concrete in limit state design.

8. Design a Reinforced concrete slab to carry a live load of 5kN/m2 on an effective span of 4m. Use M20 grade concrete and Fe415 grade steel Reinforcement. Sketch the Reinforcement details.

9. A R.C.C. beam is simply supported beam on two masonry walls of 230mm thick which are 6m apart (centre-to-centre). The beam is carrying an imposed load of 20kN/m. Design the beam with all necessary checks (Check for Shear and check for Deflection). Use M20 Concrete and Fe500 Steel.

10. A beam section 350mm wide and 550mm deep is reinforced with a tension reinforcement of 3000mm^2 at an effective cover of 300mm. Determine the ultimate moment of resistance of beam section. Use M20 concrete and Fe 500.

11. Find the moment of resistance of a T beam having the following data B_f=750mm, d=300mm, b_w=230mm, A_{st}=4000mm^2, D_f=100mm, use M20 and Fe 415.

12. Design a balanced singly reinforced concrete beam section for an applied moment of 56kNm. The width of the beam is limited to 150mm. use M15 and Fe250 bars.

UNIT-II

13. Design a rectangular Cantilever Rc beam over a clear span of 6m, if the superimposed load is 12kN/m and the support width is 230mm. use M20 grade concrete and Fe 415 grade steel. The beam is to have width of 300mm. design the shear reinforcement and check for deflection.

14. .Find the M.R of a singly Reinforced Concrete Beam of 350mm width and 550mm effective depth, reinforced with 4 bars of 20mm dia of Fe 415 grade steel, use M20 grade concrete.

15. An RCC beam of 230mm wide and 450mm deep is reinforced with 4 bars of 16mm dia and Fe415 grade steel on tension side. If design shear force value is 60kN. Design the shear reinforcement consisting only vertical bars, use M20.

16. A rectangular beam of width 250mm & effective depth is 460mm, The beam carries a tensile Reinforcement of 4 numbers of 16mm dia and 2 numbers of 12mm dia in compression steel with an effective cover of 30mm on both sides. The effective span of the beam is 5.25m with simply supported ends, use M20 grade and Fe 415 grade steel.

17. Calculate the area of reinforcement required for a simply supported reinforced concrete beam 230mm wide and 400mm effective depth to resist on ultimate moment of 60KNm. Use M20, Fe415

UNIT-III

18. Determine the reinforcement for a column of a braced frame for the following data, size 400 mm x 600 mm, u= 2000 KN, M_{ux} = 160 KN, M_{uy} = 120 KNM, unsupported length = 4m.E.C= 60 mm, M_{20}, Fe415 used

19. Design a short column square in section to carry an axial load of 2000 KN using M 20 grade concrete and Fe415 steel. Take load factor as 1.5.

20. Determine the rfm for a column of a braced frame for the following data, size 400 mm x 600 mm, u= 2000 KN, M_{ux} = 160 KN, M_{uy} = 120 KNM, unsupported length = 4m. E.C = 60 mm, M_{20}, Fe415 used

21. Design a short column square in section to carry an axial load of 2000 KN using M 20 grade concrete and Fe415 steel. Take load factor as 1.5.

22. A short column 300x300mm is reinforced with 5 numbers of 20mm dia. Find the axial factored load that the column can carry, use M25 and Fe250 grade steel.

UNIT-IV

23. Design a two way slab for a room 5.5 x 4m clear in size if the super imposed load is 7 KN/M^2. Use M20, Fe415, Corners not held down

24. Design a simply supported RC slab for room of clear size 3.5mx4.5m superimposed load is 2.5KN/sq. m and weight of finishes is 1.0 KN/sq. m. The corners of the slab are not held down . Use M-20 concrete and Fe-415 steel.

25. Design a Reinforced concrete slab to carry a live load of 3kN/m2 on an effective span of 3.5m. Use M20 grade concrete and Fe415 grade steel Reinforcement. Sketch the Reinforcement details.

26. Design a slab for a classroom 3x4.5m to carry a live load of 3.5kN/m2 and a floor finish of 1kN/m2. The slab is discontinuous over all the four sides. The corners of the slab are free to lift, take wall thickness as 230mmand use M20 and Fe415 grade steel.

27. Design a simply supported roof slab for a room 7.5mx3.5m clear in size. The slab is carrying an imposed load of 10kN/m^2. Use M25 Concrete and Fe415 Steel

UNIT-V

28. Design a square footing of uniform thickness for a reinforced concrete column 500x500mm carrying an axial load of 500 KN. The safe bearing capacity of soil is 125KN/m2. Use M20 grade concrete and Fe 415 steel. Check for on way and two way shear

29. Design a reinforced Concrete footing of uniform thickness for a reinforced concrete column of 500mmx500mm size carrying an axial load of 1500kN using M25 grade of concrete and Fe415 grade of steel. The SBC of soil is 220kN/m2 .

30. Design a footing of uniform thickness for a reinforced concrete column of 250mmx400mm size carrying an axial load of 1200kN using M20 and Fe415 grade steel. The SBC of soil is 180kN/m2.

31. Design a footing of uniform thickness for a reinforced concrete column of 400mmx600mm size carrying an axial load of 1000kN using M25 and Fe500 grade steel. The SBC of soil is 200kN/m2.

32. Design a square footing of uniform thickness for a reinforced concrete column 400x400mm carrying an axial load of 450 KN. The safe bearing capacity of soil is 120KN/m2. Use M20 grade concrete and Fe 500 steel. Check for on way and two way shear.