

1. A fixed beam of span 9.0 m is subjected to a UDL of 24 KN/m over its entire span. It is carrying a point load of 60KN at a distance of 2.0 m from R.H.S. support. Find fixed end moments a7 Draw S.F.D. and B.M.D. for the beam.
2. A fixed beam of span 8.0 m is subjected to a UDL of 35 KN/m over its entire span. It is carrying a point load of 90KN at a distance of 3.0 m from LR.H.S. Support. Find fixed end moments a7 Draw S.F.D. and B.M.D. for the beam.
3. Differentiate between a simple supported beam & a fixed beam w.r.t deflection, rigidity, bending moments, Bending moments at support, Statically determinate structure, reactions at support & depth of beam
4. Explain advantages & disadvantages of continuous beam.
5. Explain primary & secondary torsion.
6. Define Torsion & explain deformations caused due to torsion.
7. Enlist various loads acting on a building, explaining each in one line.
8. Write short notes on-
 - a. Seismic load
 - b. Reversal stresses
 - c. Wind loads & factors affecting wind load
 - d. Various categories of buildings as classified by IS 875 part 2 for live loads
9. Explain working stress method of design in brief.
10. Explain the term factor of safety.
11. Explain the advantages & limitations of WSM in structural design.
12. A balcony is to be constructed for an office building using timber joists spaced at 1.83 m centre to centre cantilevering out for a span of 1.22 m. size of block board is 1.83 m x 1.22 m x 32 mm thick. The joist support a flooring of total dead load 2.5 KN/m². Design the beam for the following-
 - a. Take $d=2.5 b$
 - b. Type of wood=Teak wood, density – 6.27 KN/m³, $E=9.42 \times 10^3$ N/mm²
 - c. Permissible Shear Stress for outside location -11.38 N/mm²
 - d. Allowable Deflection – span/180
 - e. Take Live Load as 4 KN/m²

13. Design a timber beam to take a load of 15 KN/m over a simply supported effective span of 4.56 m considering the following check for shear only-
 - a. Take $d=2b$
 - b. Permissible bending stress for inside location -12.16 N/mm²
 - c. Permissible shear stress -1.37 N/mm²
 - d. $E = 8.93 \times 10^3$ N.mm²
14. Explain the structural properties of timber w.r.t. checks & shakes, knots, slope of grain, moisture content, heart wood & sap wood/ live trees or dead trees, fire resistance.
15. What are advantages & disadvantages of timber as a structural member?
16. Write short notes on-
 - a. Requirements of good concrete
 - b. Grades & proportions of concrete
 - c. Water cement ratio in concrete
 - d. Form work for concrete
 - e. Curing of concrete – importance & methods
 - f. Slump test & cube test for concrete
17. Define & explain Limit State method of Design.
18. Explain limit state of Cracking & durability.
19. Design the depth of steel required for flexure for a 230 mm wide beam simply supported over an effective span of 6.23 m carrying a UDL of 22 KN/m over the entire span w.r.t. flexure only. Use M25 grade concrete & Fe 500 steel.
20. Distinguish between One way & Two Way slab
21. Explain in detail load distribution in two way slab.
22. Explain why shear stirrups are closely spaced at the supports.
23. Explain what can be done to reduce the depths of beams.
24. Explain Advantages & Disadvantages of Steel structure.
25. What are two types of structural steel available?