

QUESTION BANK ON STRUCTURAL MECHANICS

1. Define compressive strain.
2. What is free body diagram.
3. Define moment of inertia.
4. What is section modulus.
5. Define point of contraflexure.
6. Define the ductile material with example.
7. What is isotropic material?
8. What is meant by principal plane.
9. Define ultimate stress and breaking stress?
10. Define center of gravity.
11. Define redundant frame.
12. Define Poisson's ratio.
13. State Hooke's law.
14. State the parallel axis theorem.
15. Define torsional rigidity.
16. Draw the neat sketch of stress strain diagram for mild steel and explain the salient points in detail.
17. A rectangular beam 10 cm wide is subjected to the maximum shear force of 50 Kn ,the corresponding maximum shear stress being 3N/mm^2 . Calculate the depth of beam.
18. write down the assumption in the theory of pure bending.
19. Derive the relationship between the rate of loading ,S.F and B.M at a section of beam.
20. A beam of rectangular beam 80 mm wide and 160 mm deep is subjected to a shearing force of 40 kn. Calculate the maximum shear stress .
21. Draw the S.F. diagram and B.M diagram for a simple supported beam carry a point load at centre of the beam.
22. A fixed beam is subjected to an UDL over whole span .Derive the expression for fixed end moments.
23. Derive an expression for slope and deflection of a simple supported beam subjected to a central point load.
24. A solid circular shaft 100 mm diameter is transmitting 120 kw at 140 r p.m find the intensity of shear stress in the shaft.
25. State sign convention for shear forces and Bending moments with sketches
26. What is Ductility and durability.
27. Derive the relation between bulk modulus and Young's modulus.
28. A fixed beam AB of span 2.5 m subjected to a point load of 20 kn at mid span. Draw the Bending moment diagram.
29. Calculate the maximum slope and deflection in case of a simple supported beam of span 6 m subjected to a point load 10 Kn at the middle of the span. EI constant.
30. The principal stresses at a point across two perpendicular planes are 75 MN/ m^2 and 35 MN/ m^2 . Find the resultant stress & its obliquity on a plane at 20 degree with major principal plane.