SCHOOL OF DIPLOMA ENGINEERING, SOLDHA
QUESTIONS FOR REVISION
DIPLOMA ME & AUTO. 3RD SEM
SUBJECT-STRENGTH OF MATERIAL

VERY SHORT QUESTIONS (2 MARKS)

1. Define load
2. Define stress and give its unit
3. Thermal stress
4. Lateral strain
5. Poisson's ratio
6. Define elastic limit
7. Limit of proportionality
8. Hoop stress
9. Modulus of elasticity
10. Resilience
11. Proof resilience
12. Various modes of loading
13. Torsional resilience
14. Proof load
15. Moment of inertia
16. Section modulus
17. Axis of symmetry
18. Centroidal axis
19. Moment of resistance
20. Pure bending
21. Modular ratio
22. Hooging bending moment
23. Sagging bending moment
24. Types of beam
25. Point load
26. U.D.L
27. Point of contraflexture
28. Column
29. Slenderness ratio
30. Equivalent length of the column
31. Buckling load
32. Long column
33. Torsion
34. Polar moment of inertia
35. Strength of a solid shaft
36. Torsional rigidity of a shaft
37. Neutral axis
38. Power transmitted by a shaft
39. Spring
40. Types of spring
41. Solid length of spring
42. Free length
43. Helical spring
44. Laminated spring
45. Spring index

46. Stiffness of spring
47. Helix angle
48. Volumetric strain
49. Bulk modulus
50. Modulus of rigidity

SHORT QUESTIONS (4 MARKS)

(1) A steel rod 8m long is heated from 10° C to 60°C. Find temperature stress & free expansion of the road.
(2) For lifting a load of 4KN with the help of a steel wire if stress not to exceed 80 Mpa , find safe diameter.
(3) Write a relation for the stress induced in a body due to shear resilience.
(4) Calculate the resilience and modulus of resilience of a bar 150mm long, 50 mm wide and 40 mm thick, subjected to a tensile load of 60 KN appied gradually. Take E= 2.1×10^5 N/mm^2
(5) Theorem of parallel axis
(6) Theorem of perpendicular axis
(7) A rectangular is of breadth 12.5 cm and depth 25 cm finds its section modulus.
(8) Explian M.O.I. of a hollow rectangular section.
(9) Explain various types of load
(10) Assumption made in the theory of simple bending
(11) How column are classified ? explain
(12) Assumption for circular shaft subjected to torsion
(13) Find a torque which a shaft of diameter 250 mm maximum shear stress exceed to 60 N/mm^2
(14) A solid steel shaft 50 mm diameter & 700 mm long transmit 30 KW at 180 rpm. Find the maximum shear stress induced
(15) A cantilever 1 m long carries a UDL of 3KN/m^2 of it length beyond 300mm from free end. Draw its S.F. and B.M diagram.
(16) What are the function of springs
(17) Explain the concept of mean & maximum torque in brief
(18) Define factor of safety
(19) Explian types of spring
(20) Explian deflection in a spring and give expression to calculate spring deflection.

LONG QUESTIONS (10 MARKS)

(1) A rod of 60mm diameter 8 m long is subjected to an axial pull of 120 KN . if E= 200 Gpa of the material of the rod then , determine stress, strain & elongation.
(2) A load of 50KN is suspended by a steel pipe 50 mm external diameter. If the ultimate tensile strength of steel is 500N/mm^2 and FOS is 6. Find the pipe thickness.
(3) A bar 200 m long (32 mm × 32 mm) section for 105 m of its length, 15 mm diameter. For 55 m length and 30 mm diameter for remaining length. If the tensile force of 60 KN is applied to the bar , calculate the stress induced in different section and total elongation. Take E= 2×10^5 N/mm^2.

(4) An axial pull of 40 KN is suddenly applied to a steel rod of 1.8 m long and 800 mm ^{2} in section. Calculate the strain energy that can be stored. Take E= 2×10^5 N/mm^2

(5) A simply supported beam 4m long is subjected to two point loads of 2.5 KN and 3.5 KN each at distance of 1 m and 3 m respectively from the left hand support. Draw SFD & BMD for beam.

(6) A beam 12 m long is supported at one end and at a point 10 m from first support, it carries a udl of 100N/M over the entire length. Draw SFD & BMD . also find maximum BM.

(7) An unequal angle section 100×80×10 mm stands with 80 mm side as base. Determine second moment of area about horizontal axis through thr centroid.

(8) A solid steel shaft has to transmit power 65 KW at 160 rpm. Take allowable shear stress as 80 N/mm^2, find suitable diameter of the shaft if maximum torque is 30% more than the mean torque.

(9) If the inside diameter of a hollow shaft is to be 0.75 of outside diameter. Find the outer diameter of the shaft to transmit 65 KW at 1200 rpm with allowable shear stress 100 MN/m^2.

(10) A laminated spring is to be made of 6 steel plates , each plate have 60 mm wide and 7 mm thick. Calculate the length of spring so that it may carry an external load of 2.2 KN, The stress being limited to 150 N/mm^2.