4th / Arch.

Subject : Structure Mechanics

Time : 3 Hrs.   M.M. : 100

SECTION-A

Note: Objective type questions. All questions are compulsory   (10x1=10)

Q.1   Define couple.

Q.2   Define live load.

Q.3   Tell the two types of force systems.

Q.4   Define snow load.

Q.5   Define centre of gravity.

Q.6   List any two types of stress.

Q.7   State parallel axis theorem.

Q.8   Define strain.

Q.9   Describe parallelogram law of forces.

Q.31   State & explain Hooke's law.

Q.32   Draw bending moment diagram of over hanging beam subjected to point load.

SECTION-D

Note: Long answer type questions. Attempt any three questions out of four questions.   3x10=30

Q.33   A simply supported beam 8m long carries point loads of 600N & 800N at a distance of 2m and 5m from the left end support and a uniformly distributed load of 200N/m is between the point loads. Calculate and draw the Shear Force and Bending with neat sketch.

Q.34   Classify different types of beams in detail with neat sketch.

Q.35   A rod 25 mm in diameter & 5 m long is subjected to an axial pull of 75KN. If E = 210 x 1000000 n/m^2 of the material of the rod, then calculate stress, strain & elongation.

Q.36   A steel plate of width 60 mm & of thickness 15 mm is bent into a circular arc of radius 15m. Calculate the maximum stress induced and the bending moment, which will produce max. stress. Take E = 2 x 100000 N/mm^2.

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Q.10 List any two types of coplanar forces.

SECTION-B

Note: Very short answer type questions. Attempt any ten questions out of twelve questions. 10x2=20

Q.11 Differentiate between concurrent & non-concurrent forces.

Q.12 State & explain Lamis theorem.

Q.13 Describe any two characteristics of moment.

Q.14 Differentiate between point load & uniformly distributed load.

Q.15 State & explain perpendicular axis theorem.

Q.16 Draw stress strain curve for mild steel specimen subjected to tensile force.

Q.17 Describe temperature stresses & strain.

Q.18 Explain the concept of moment of resistance.

Q.19 Describe the equilibrium of rigid bodies.

Q.20 Describe free body diagram.

Q.21 Describe between hinged & fixed support.

Q.22 Differentiate between tension & compression.

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. 8x5=40

Q.23 Draw bending moment diagram of cantilever subjected to uniformly distributed load.

Q.24 Describe the assumptions used in simple bending theory.

Q.25 Draw bending moment diagram of simply supported beam subjected to point load.

Q.26 Describe the assumptions used in computing the forces in members of a perfect frame.

Q.27 Draw shear force diagram of cantilever subjected to point load.

Q.28 Draw shear force diagram of over hanging beams subjected to uniformly distributed loads.

Q.29 A steel wire of 6 mm diameter is bent into a circular shape of 6 m radius. Determine the maximum stress induced in the wire. E= 200 GPa.

Q.30 Explain the significance of Shear force and Bending moment diagram?