Q.26 Define and explain the theorem of parallel axes.

Q.27 Explain different types of loads which acts on a beam.

Q.28 Find M.O.I. of a hollow shaft of 80mm external diameter and 40mm internal diameter.

Q.29 Explain the concept of concept of moment of resistance in detail.

Q.30 State the assumptions made in the theory of simple bending.

Q.31 Define spring and give any three functions of springs.

Q.32 A close coiled helical spring carries a load 120N and the mean coil diameter 8 times the wire diameter. Calculate the wire diameter if the maximum stress in 290 N/mm.

Q.33 State the factors on which strength of a column depends.

Q.34 State the assumptions made in theory of pure torsion.

Q.35 Differentiate between Torque and Tortion.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 An axial pull of 30KN is applied to a bar of length 20 and diameter 40mm. If E for bar material is 2×10^5 N/mm^2. Find:

a) Stress b) Strain c) Elongation of the rod

Q.37 A simply supported beam f span 4m is loaded with U.d.I of 3kN/m from centre to right end. Draw S.F. and B.M. Diagram. Also find maximum B.M.

Q.38 Derive an expression for deflection in a closed coiled helical spring subjected to axial load.

Roll No. .....

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Sub.: Strength of Matreials

Time : 3Hrs. M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 Which law is also called as the elasticity law?

a) Bernoulli's law b) Stress law
c) Hooke's law d) Poisson's law

Q.2 What is the factor of safety?

a) The ratio of stress to strain
b) The raio of permissible stress to the ultimate stress
c) The ratio of ultimate stress to the permissible stress
d) The ratio of longitudinal strain to stress

Q.3 The maximum strain energy stored at elastic limit is _____.

a) Resilience b) Proof resilience
c) Elasticity d) Malleability

Q.4 Stress in a beam due to simple bending is _____.

a) Directly proportional
b) Inversely proportional
c) Curvilinearly related
d) None of the mentioned

Q.5 The axis about which moment of area is taken is known as _____.

a) Axis of area b) Axis of moment

c) Axis of reference d) Axis of rotation

Q.6 What is the moment of inertia of a triangular section about the base?

a) $bh^2/12$ b) $bh^3/12$

c) $bh^3/6$ d) $bh^2/6$

Q.7 _____ is a horizontal structural member subjected to transverse loads perpendicular to its axis

a) Strut b) Column

c) Beam d) Truss

Q.8 The inclined member carrying compressive loads is _____.

a) Post b) Stanchion

c) Column d) Strut

Q.9 If a spring has plain ends them number of inactive coils its?

a) 1 b) 2

c) 3 d) 0

Q.10 _____ is a measure of the strength of shaft in rotation.

a) Torsional modulus b) Sectional modulus

c) Polar modulus d) Torsional rigidity

SECTION-B

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

Q.11 Define modulus of elasticity.

Q.12 Define resilience.

Q.13 Define bending moment.

Q.14 Define factor of safety.

Q.15 Define stiffness.

Q.16 Write bending equation.

Q.17 What is strain energy?

Q.18 What is neutral axis?

Q.19 Define shear stress.

Q.20 Define torsion.

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Explain stress strain diagram for a ductile material.

Q.22 Explain longitudinal strain and lateral strain.

Q.23 Discuss the difference between proof Resilience and modulus of resilience.

Q.24 Derive an expression for stress induced in a body due to falling load.

Q.25 A steel road of 25mm diameter and 2.5m long is subjected to a sudden axial pull of 75KN. Find the amount of work done and calculate the maximum instantaneous stress and elongation produced Take Y = $200KN/mm^2$