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**3rd Sem / Branch : Automobile/Mechanical Engg**  
**Subject:- Strength of Materials**

Time : 3 Hrs.

M.M. : 60

**SECTION-A**

**Note:** Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 Bulk modulus is defined as the ratio of. (CO1)

- a) Normal stress and volumetric strain
- b) Lateral stress and lateral strain
- c) Longitudinal stress and longitudinal strain
- d) Shear stress to shear strain

Q.2 A brittle Material has . (CO1)

- a) No elastic Zone      b) No plastic Zone
- c) Yield point            d) Breaking point

Q.3 For a simply supported beam of span L, with point load w at the maximum B.M will be (CO5)

- a) WL                    b) WL/2
- c) WL/4                d) WL/8

Q.4 The moment of inertia of a body is always minimum with respect to its. (CO4)

- a) Base                  b) Centroidal axis
- c) Vertical axis        d) horizontal axis

Q.5 Neutral axis of a beam is the axis. (CO6)

- a) Of zero stress        b) Of maximum stress
- c) Of negative stress    d) Of positive stress

Q.6 When two shafts of same length, one of which is hollow , transmit equal torques and have equal maximum stress, then they should have equal. (CO6)

- a) Polar moment of inertia
- b) Polar modulus
- c) diameter
- d) Angel of twist

**SECTION-B**

**Note:** Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 Longitudinal stress in a thin cylinder is \_\_\_\_\_ the hoop stress. (CO2)

Q.8 Define stress and strain. (CO2)

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- Q.9 The stress induces in a body , when suddenly loaded, is \_\_\_\_\_ the stress induced when the same load is applied gradually. (CO3)
- Q.10 If the slenderness ratio for a column is 100, then it is said to be a \_\_\_\_\_ Column. (CO7)
- Q.11 The bending stress in a beam is \_\_\_\_\_ section modulus. (CO6)
- Q.12 Shear modulus is the ratio of \_\_\_\_\_ and \_\_\_\_\_. (CO2)

### SECTION-C

**Note:** Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

- Q.13 What are the assumptions made in torsion? (CO6)
- Q.14 What is poission's ratio and factor of safety? (CO2)
- Q.15 Define section modulus and radius of gyration? (CO4)
- Q.16 Draw a shear force diagram of a uniformly distributed load  $W \text{ N/mm}^2$  over the whole span on a simply supported beam of length  $L$ . (CO5)
- Q.17 What is stiffness and stain energy in springs. (CO8)
- Q.18 Name different type of loading in beams? (CO2)
- Q.19 Explain Theorem of parallel axis. (CO4)
- Q.20 What is buckling load slenderness ratio? (CO7)

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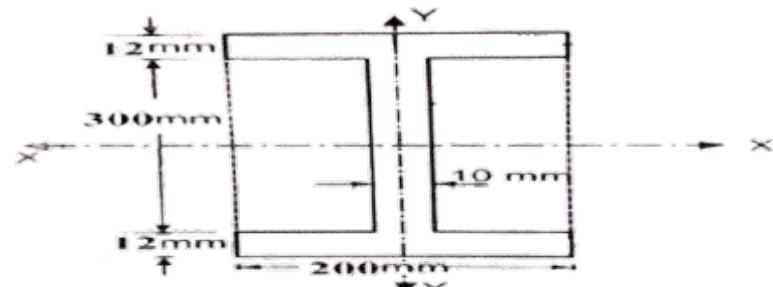
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- Q.21 What is torque and power transmitted by torque also write torsion equation. (CO6)
- Q.22 Explain Stress-Strain diagram with neat sketch. (CO2)

### SECTION-D

**Note:** Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

- Q.23 State and drive the bending equation and also write its assumptions. (CO5)
- Q.24 A steel rod 500mm long and 20mm X 10mm in cross-section is subjected to axial pull of 300KN. if modulus of elasticity is  $200000 \text{ Nmm}^2$ . Calculate the elongation the rod. Also calculate strain induced in the bar. (CO2)
- Q.25 Find the moment of inertia of a I-section as shown in the figure about X-X axis and Y-Y Passing through the C.G of the section (CO4)



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