# Question Bank

**Sub- Strength of Materials (17304)**

## 3 Marks Questions

### Chapter-4

Q-1 Define the following terms and state their units.

1) Moment of Inertia
2) Radius Of Gyration

Q-2 State and explain parallel axis theorem.

Q-3 State and explain perpendicular axis theorem.

Q-4 Find M.I. of a rectangle of 60mm * 120mm about it's 120mm edge.

### Chapter-5

Q-1 Write the flexural formula & state the meaning of symbols used.

Q-2 Define section modulus and state it's S.I. unit.

Q-3 Find the section modulus of hollow circular section with external diameter 'D' and internal diameter 'd".

Q-4 Define the terms single shear and double shear.

### Chapter-6

Q-1 Define the following terms:-

1) Direct load
2) Eccentric load
3) Axial Load

### Chapter-7

Q-1 Define Twisting moment. State it's S.I unit.

Q-2 State the Torsional formula & explain the meaning of each term.

**4 Marks Questions**

## Chapter-4

Q-1 Find the M.I. of a right angled triangle 100mm high & 140mm base in following cases.

1) about an axis passing through base.

2) about an axis passing through C.G.

3)about an axis passing through apex.

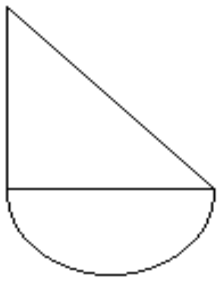
Q-2 Determine M.I. about centroidal XX axis of an unsymmetrical I-section having following details;

Top flange 160mm*12mm, Bottom flange 240mm*12mm, Web of 200mm *10mm.

Q-3 Calculate M.I. of a T-section about centroidal axis YY.Top flange is 1200mm * 200mm & web is 1800mm *200mm.Total height is 2000mm.

Q-4 Find M.I. about XX axis of an angle section passing through it's C.G having 100 X 80 X 20mm.

Q-5 A lamina consists of a semicircle & a right angle triangle with height 100mm and base 100mm is as shown in fig. Calculate M.I. about reference axis AB



## Chapter-5

Q-1 Write assumptions in the theory of simple bending.

Q-2 A Rectangular beam 120mm wide & 300mm deep is simply supported over a span of 4m. What U.D.L. the beam may carry if the bending stress is not to exceed 120MPa? The width of beam is 120mm.

Q-3 A 100 * 100 *10mm T-Section is used as cantilever beam with flange at top. It carries U.D.L. of 10KN/m. If maximum stress is not to exceed 150N/$mm^2$. Calculate maximum span.

Q-4 A steel strip 40mm wide & 6mm thick is subjected to end couples 20N-m. Find the radius of curvature of bent up strip if E = 2 * $10^5$Mpa.

Q-5 A circular beam of 100mm diameter is subjected to a shear force of 12.5KN. Calculate the value of maximum shear stress & sketch the variation of shear stress along the depth of beam.

## Chapter-6

Q-1 A rectangular column 150mm wide & 100mm thick carries a load of 150KN at an eccentricity of 50mm in the plane bisecting the thickness. Find the maximum and minimum stress.

Q-2 A hollow circular column having external & internal diameter of 40cm & 30cm respectively carries a vertical load of 150KN at outer edge of column. Calculate the maximum & minimum intensities of stress in section.

Q-3 A diamond shaped pier with diagonals 3m & 6m is subjected to an eccentric load of 1500KN at a distance of 1m from centroid & on longer diagonal. Calculate maximum stress induced in section.

## Chapter-7

Q-1 Write the assumptions in theory of Torsion.

Q-2 Find the torque that can be applied to a shaft of 100mm in diameter if the permissible angle of twist is $2.75^0$ in a length of 6m. Take C = 80 $KN/mm^2$.

Q-3 A shaft has to transmit 105 KW at 160rpm if the shear stress is not to exceed $65N/mm^2$ & twist in length of 3.5m must not exceed $1^0$. Find the diameter of the shaft.Take C = $8 * 10^5 N/mm^2$.

Q-4 Calculate the power a shaft of 300mm can transmit with a speed of 200rpm if permissible shear stress is $120N/mm^2$. Take maximum torque is 30% more than the average torque.