Question Bank (G scheme)

Name of subject: STRENGTH OF MATERIAL **Unit Test :II**
Subject code: 17304 **Course : ME**
Semester: III

Chapter-5 Bending Stresses

Q-1 Write the flexural formula & state the meaning of symbols used. (3 M)

Q-2 Define section modulus and state it's S.I. unit. (3 M)

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

Q-4 Define the terms single shear and double shear. (3 M)

Q-5 Write assumptions in the theory of simple bending. (4 M)

Q-6 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. (4 M)

Q-7 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. (4 M)

Q-8 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 * 10^5Mpa. (4 M)

Q-9 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. (4 M)

Q-10 A hollow rectangular beam section square in size having outer dimensions 120mm X 120mm with thickness of material 20mm is carrying a shear force of 125KN.Calculate the maximum shear stress induced in the section. (4 M)

Chapter-6 Direct and Bending Stresses

Q-1 Define the following terms:- (3 M)

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

Q-2 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. (4 M)

Q-3 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. (4 M)

Q-4 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. (4 M)

Q-5 Define core of section. Sketch the core section for a rectangular section. (4 M)

Chapter-7 Torsion

Q-1 Define Twisting moment. State it's S.I unit. (3 M)

Q-2 State the Torsional formula & explain the meaning of each term. (3 M)

Q-3 Write the assumptions in theory of Torsion. (4 M)

Q-4 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. (4 M)

Q-5 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 * 10^5N/mm^2. (4 M)

Q-6 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. (4 M)

Q-7 Find the polar modulus of a solid circular shaft of diameter 300mm. (4 M)