

Question Bank (I scheme)

Name of subject: APPLIED MECHANICS Unit Test :II

Subject code: 22203 Course :CH/ME

Semester: II

Chapter-4 Equilibrium

Q-1 Define the relation between resultant and equilibrant? (2 Marks)

Q-2 Write the analytical conditions of equilibrium for coplanar concurrent force system. (2 Marks)

Q-3 Define the free body and free body diagram. (2 Marks)

Q-4 State the lami's theorem? State it's limitations. (2Marks)

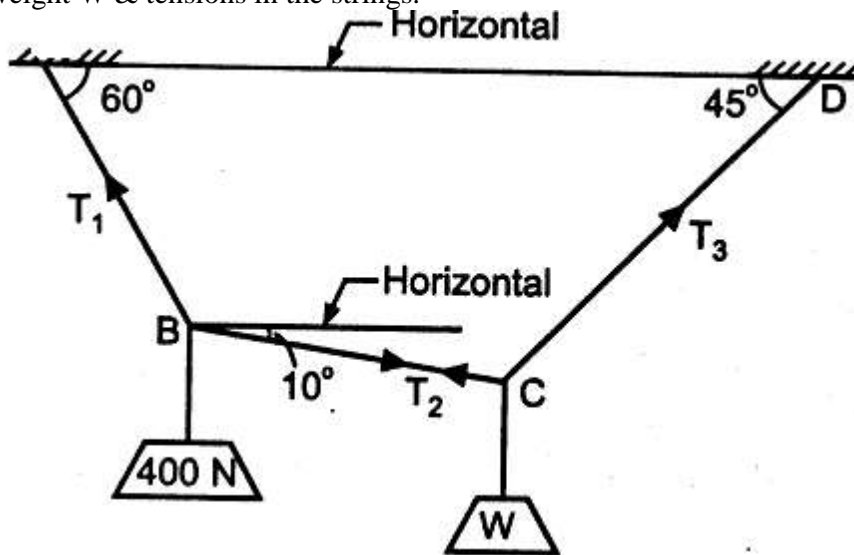
Q-5 A sphere of weight 400N rests in a groove of smooth inclined surfaces which are making 60° and 30° inclination to horizontal. Find the reactions at contact surfaces analytically. (4 Marks)

Q-6 A beam ABC is hinged at A and roller supported at B. Span AB is 5m and overhang BC is 2m. Beam carries UDL of 20 KN/m over a span BC along with point load of 50 KN at 2.5m from support A. Calculate support reactions graphically. (4 Marks)

Q-7 A truck weighing 150KN while crossing a bridge AB, 20m span assumed simply supported stopped due to breakdown at a distance of 4m from B. Find the upward force that should be exerted by end supports if the self weight of bridge is 5KN/m. (4 Marks)

Q-8 A weight of 100 N is suspended by a knot from two strings, attached to a horizontal beam. These strings make angles of 45° and 30° with horizontal. Find the tensions in strings graphically. (4 M)

Q-9)A string ABCD is fixed at A & D. Two weights 400 N & 'W' N are attached at B & C. The strings AB, BC & CD are making angles of 60° , 10° & 45° with horizontal respectively. Find the weight W & tensions in the strings.



Chapter-5 Friction

Q-1 Define the terms i) Angle of friction ii) Angle of repose iii) Coefficient of friction. (2 Marks)

Q-2 State the advantages of Friction. (2 Marks)

Q-3 Explain why lubricating oil is used in machines. (2 Marks)

Q-4 A force of 20N is required to pull a body of 50N resting on horizontal plane. What will be the coefficient of friction. (2 Marks)

Q-5 A body of weight 300N is placed on plane inclined at an angle of 17° with horizontal. If the coefficient of friction is 0.3, Find the value of the force to be applied parallel to the plane just to move the body up the plane. (4 Marks)

Q-6 A body weighing 1500N is resting on a rough horizontal plane. A pull of 300N applied at 30° with horizontal just moves the body. Find the coefficient of friction. (4 Marks)

Q-7 a body resting on a horizontal plane required a pull of 80N inclined at 30° to horizontal just to move it. It was also found that a push of 100N inclined at 30° to the horizontal just moved the body. Find the weight of body and coefficient of friction. (4 Marks)

Q-8 A body of 400N weight rests in a limiting equilibrium on 30° rough inclined plane. If the angle of the plane is raised to 45° Find the force along the plane required to keep the body in equilibrium. (4 Marks)

Q-10 Write the laws of static Friction. (4 Marks)

Chapter-6 Centroid & Centre of Gravity

Q-1 Define the terms centroid and centre of Gravity. (2 Marks)

Q-2 Show in sketch the C.G. of a hemisphere of diameter 200mm. (2 Marks)

Q-3 Calculate the centroid of semicircle of radius 100mm. (2 Marks)

Q-4 Locate the centroid of angle section having flange 100 X 10mm and web 10 X 80mm. (4 Marks)

Q-5 A retaining wall of height 5.2m has one side vertical. The top width is 1.2m and bottom width is 3.6m. find centroid. (4 Marks)

Q-6 Find the centroid of channel section 30cm x 12cm x 2cm from back of web. (4 Marks)

Q-7 A hemisphere of diameter 100mm is placed on top of a cylinder whose diameter is also 100mm. Find C.G. of composite solid from the base of cylinder if its height is 120mm. (4 Marks)

Q-8 A solid cone of 500mm height and 200mm base diameter. If portion above half of its height is removed, determine the point at which the remaining body can be balanced. (4 Marks)

Q-9 A solid cone of base diameter 120mm and height 320mm is placed on a horizontal plane with its apex at the top. Find the maximum angle of tilt from which it can come back to the original position. (4 Marks)