**Final TermExamination** (*spring Semester 2020)*

**Subject:** Mechanics of Solid 2  **Duration:** 6 Hours

I**nstructor**: Engr. Muhammad Saqib **Total Marks:**50

**Note:** Attempt all questions. Manage your time properly.

**Q No 1) (CLO 2) (15)**

Determine the location of the shear center for the beams having the cross sectional dimensions shown in the figure 1. All members are to be considered thin walled and calculations should be based on the centerline dimensions

b) Determine the thickness of the wall of a water tank constructed from steel plates filled to a height of 26ft , the circumferential stress is limited to 6000psi the specific weight of water is 62.4 lb//ft3

**Q No 2) (CLO3) (20)**

**a)The** 100 by 150mm wooden beam shown in figure 2 is used to support a uniformly distributed load of 4KN on a simply span of 3m .the applied load acts in a plane making an angle of 30 degree with vertical .Calculate he maximum bending stress at mid span and for the same section locate the neutral axis. Neglect the weight of the beam.

b)The T section shown in figure 3 is the cross section of a simply supported beam 16 ft long that carries a central concentrated load inclined 60degree left to the y axis the centroid is 3.07 in below the top of the section Ix=112.6 in4 and Iy = 18.7 in4 if compressive stress is limited to 12000 psi and tensile stress to 5000psi. What is the maximum load that will not overstress the beam?

**Q No 3)** **(CLO3) (15)**

A 10ft long strut braced in the middle has a rectangular section of 0.75 in by 2 in. A bolt through each end secures the strut so that it acts as a hinged column about an axis perpendicular to the 2 in dimension and as a fixed ended column about an axis parallel to 2in dimension. Determine the safe load P about using a factor of safety of 2 and E = 10.3×106

