Indian Institute of Technology Guwahati
ME 101: Engineering Mechanics (2016-2017, Sem II)
Quiz-1 (30.01.2017)

Time: 8:00 AM – 8:55 AM   Full Marks: 60

Q1. A piece of sheet metal is bent into the shape shown (Fig.1) and is acted upon by **three forces**. If the forces have the same magnitude **P**, replace them with an equivalent wrench. Determine the following:
(a) Magnitude and the direction of the resultant force   [4 marks]
(b) Magnitude and the direction of moment of the wrench   [8 marks]
(c) Locate the point where the axis of the wrench intersects the *xy* plane   [8 marks]

Q2. A weight of **1200 N** is supported by a rope through a frictionless pulley in conjunction with a system of beam and bent member as shown in Fig. 2. Please note that joints **A, B and D** are pinned joints.
(a) Draw the free body diagrams for members AB and BCD.   [8 marks]
(b) Find the support reaction at A   [12 marks]

Q3. Analyse the truss as shown in Fig. 3 using the method of joints. Determine the following:
(a) Find out the support reactions   [3 marks]
(b) Identify the zero force members   [4 marks]
(c) Calculate force in the each member with clearly identifying whether the member is
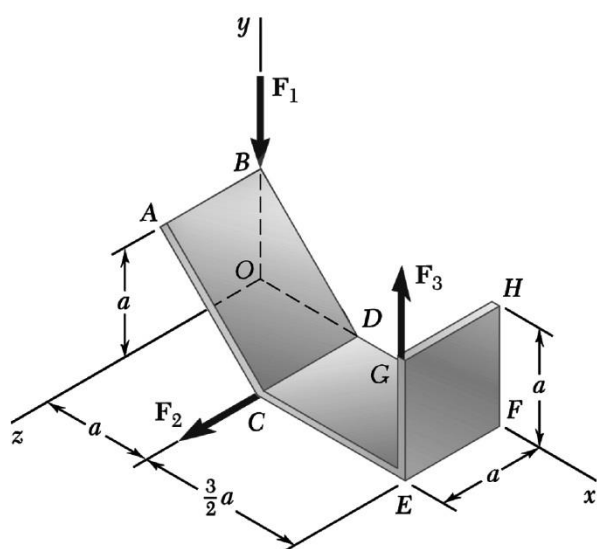   in tension (T)   or   compression (C).   [13 marks]
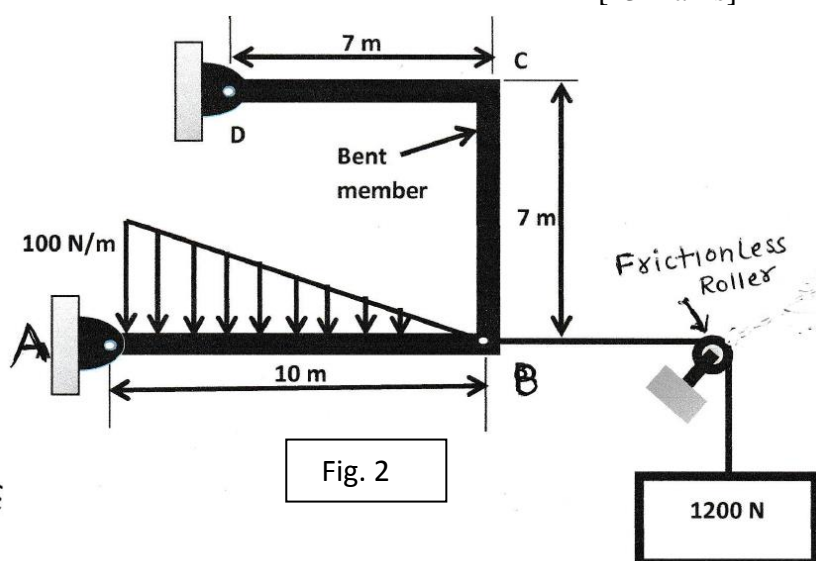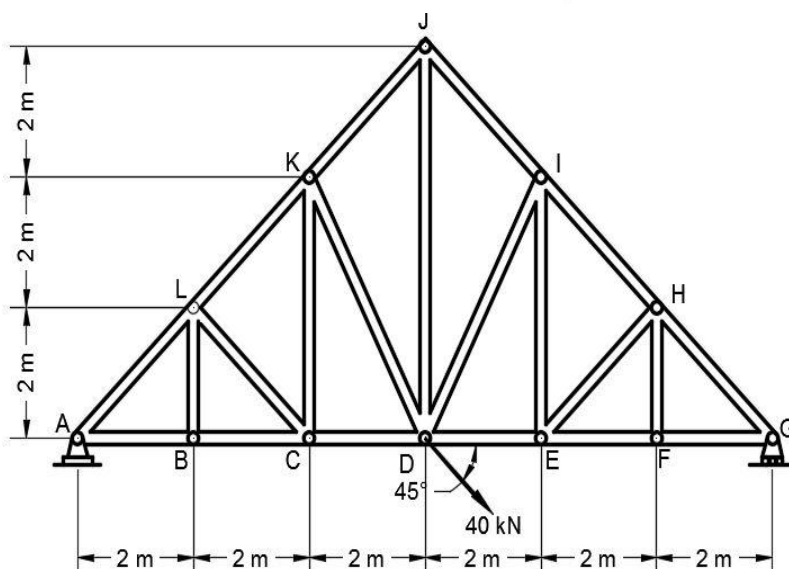

Fig. 1

Fig. 2

1200 N

Fig. 3