**ME251 Engineering Design and Graphics- Laboratory exercise 4**

**Friday, August 19, 2016**

1) Draw the half sectioned front view and right side view of the assembled flexible type coupling shown in figure. The shaft diameter is 40 mm. Four M16 x 2 bolts with hexagonal head are used. The diameter G has to be such that there should be a radial clearance of 4 mm between the bolt head and the shroud inner surface. This space is required for tightening the bolt and nut using a box wrench. In the half section, the rubber bushes have to be sectioned and shaded light black (no hatching). The bolt, nut and washer and shaft will not be sectioned. Use conventional representation for bots. Bolt head and nut has to be drawn using the method followed in last lab. The plain washer used has an outer diameter of 2d + 3 mm, inner diameter of d + 1 mm and thickness of 0.12d, where d is the bolt major diameter in mm. The fillets (marked F in figure) in both flanges have a radius of 5 mm).

   Assume the length of the sunk taper key as 45 mm. The taper in the key is 1:100. The width and thickness of the key is as per the relations given in class. The outer diameter of the bush is 30 mm and inner diameter is 16 mm. Its length is 29 mm and it compresses by 1 mm during tightening of the nut. After tightening the nut, two threads of the bolt can be seen protruding out of the nut. Dimension (major dimensions only) the drawing using uni-directional system. Use scale of 1:1