CIV100F – MECHANICS ONLINE

Assignment No. 3

Due: As indicated in Quercus

Material Covered: Textbook – Chapter 4

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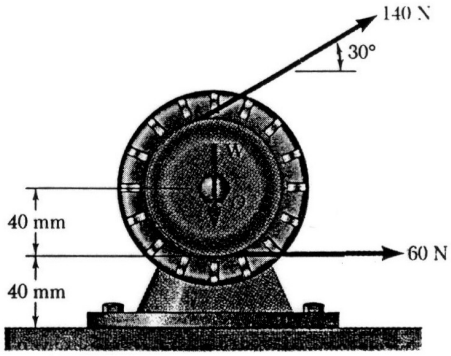
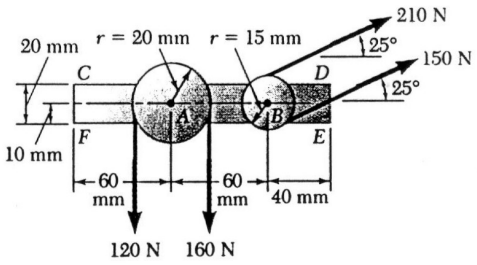
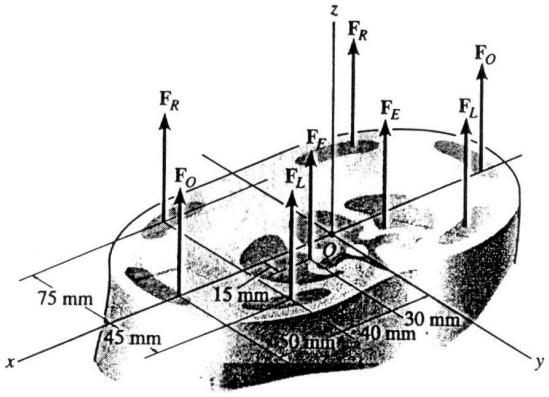
1. A 3.26 kg motor is mounted on the floor. Find the single resultant of the weight and the forces exerted on the belt and determine where the line of action of the resultant intersects the floor.



2. Pulleys *A* and *B* are mounted on bracket *CDEF*. The tension on each side of the two belts is as shown. Replace the four forces with a single equivalent force and determine where its line of action intersects the bottom edge of the bracket *EF*.



3. A biomechanical model of the lumbar region of the human trunk is shown. The forces acting in the four muscle groups consist of $F_R = 35$ N for the rectus, $F_O = 45$ N for the oblique, $F_L = 23$ N for the lumbar latissimus dorsi and $F_E = 32$ N for the erector spinae. These loadings are symmetric with respect to the *y*-*z* plane. Determine the resultant force equivalent to the given parallel force system and locate its point of application (x,y) on the trunk.



4. Determine the resultant couple moment of the two couples which act on the assembly. Member *OB* lies in the *z*-*x* plane.