College of Engineering & Technology

Department: Mechanical Engineering Marks: 20
Lecturer: Dr. Rola Afify Time: 10.30 - 12.00
Course Code: ME276 Date: 10/12/2014

Name: **Reg. No.:**

Answer the following questions:

Question one (10 marks)

The gears attached to the fixed-end steel shaft are subjected to the torques shown in Fig.1. If the modulus of Rigidity is 80 GPa and the shaft has a diameter of 14 mm, determine the displacement of the tooth P on gear A, maximum shear stress in the shaft and draw the torque diagram. The shaft turns freely within the bearing at B.
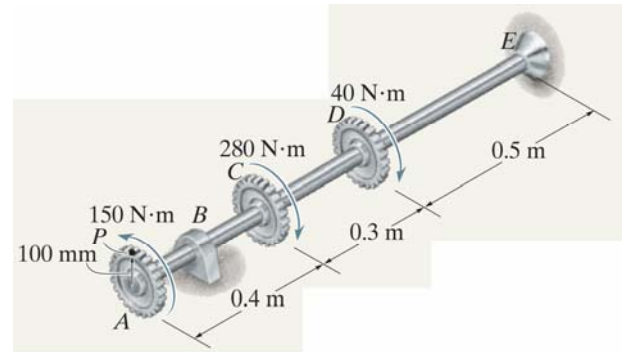

Fig.1

Question two (10 marks)

The solid rod shown in Fig. 2 has a diameter of 2 cm. If it is subjected to the force of 800 N, determine the state of stress and the principal stresses at point A.
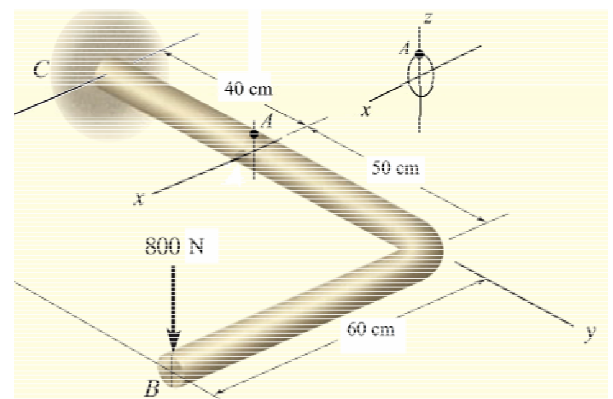

Fig. 2

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Dr. Rola Afify