	Alexandria Higher Institute of Engineering & Technology (AIET)		
	Industrial Department		First Year
	ME142	Design of Machine elements	Midterm, April, 3, 2012
	Examiners:	Dr. Rola Afify and committee	Time: 1.5 hour

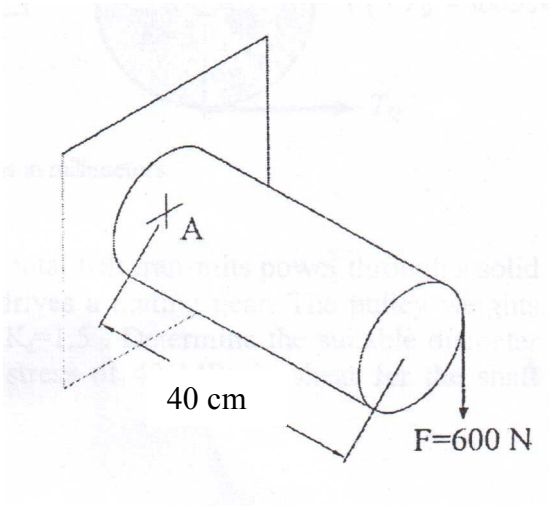
Answer the following questions:

Question one (10 marks)

a) What are the general considerations in machine design?

b) Define: Strength – Brittlness – Toughness - Creep.

c) For the shaft shown in figure, diameter 5cm, find the maximum stress and maximum shear stress at point A. You may use this $\sigma_{max} = \frac{\sigma}{2} \pm \sqrt{\left(\frac{\sigma}{2}\right)^2 + \tau^2}$.



Question two (10 marks)

a) Compare between axial tension and axial compression.

b) Draw, using neat sketches, the following:

1. A set screw with button head and half dog point.
2. A flat key.
3. A woodruff key.