

الثلاثاء : ٢٠١٥/٦/٢ م
المستوى: الثانى
برنامج: الهندسة الزراعية والنظم الحيوية
الفترة : من ١٠ - ١٢

بسم الله الرحمن الرحيم
إمتحان مقرر
تحليل الإجهادات
للطلاب المستجدين

جامعة المنصورة
كلية الزراعة
قسم الهندسة
الزراعية

All the following questions may be attempted

First question (10-mark)

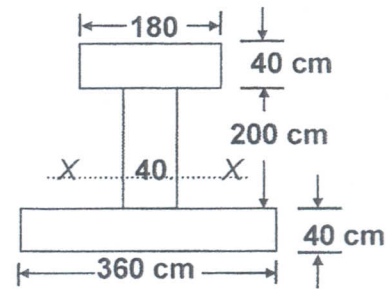
A simple turnbuckle arrangement is constructed from a **40 mm** outside diameter tube threaded internally at each end to take two rods of **25 mm** outside diameter with threaded ends. What will be the nominal stress set up in the tube and rods, ignoring thread depth, when the turnbuckle carries an axial load of **30 kN**? Assuming a sufficient strength of thread, what maximum load can be transmitted by the turnbuckle if the maximum stress is limited to **180 MN/m²**?

Second question (20-mark)

Determine the dimensions of a hollow shaft with a diameter ratio of **3:4** which is to transmit **60.318 72 kW** at **200 rpm**. The maximum shear stress in the shaft is limited to **70.243 MN/m²** and the angle of twist to **3.8°** in a length of **4 m**. The shear modulus for the shaft material is **80 GN/m²**.

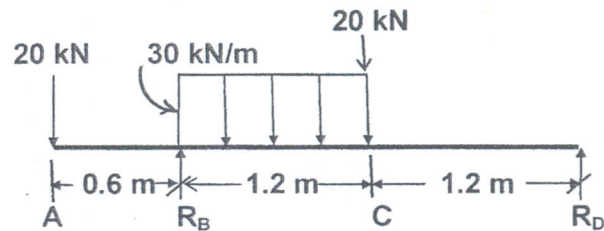
Third question (15-mark)

Determine the location of the centroidal **XX** axis of the area shown in the opposite figure. Compute the moment of inertia and the radius of gyration using the transfer formula of parallel axes. Units in cm.



Fourth question (15-mark)

Determine the maximum shear force and the maximum bending moment, and draw in the overhanging beam shown in the following figure:



With my best wishes
Prof. Dr. Salah Mostafa Abdellatif