College of Engineering & Technology

Department: Mechanical Engineering	Marks: 20
Lecturer: Dr. Rola Afify	Time: 11.00 - 12.00
Course Code: ME356	Date: 16/12/2015

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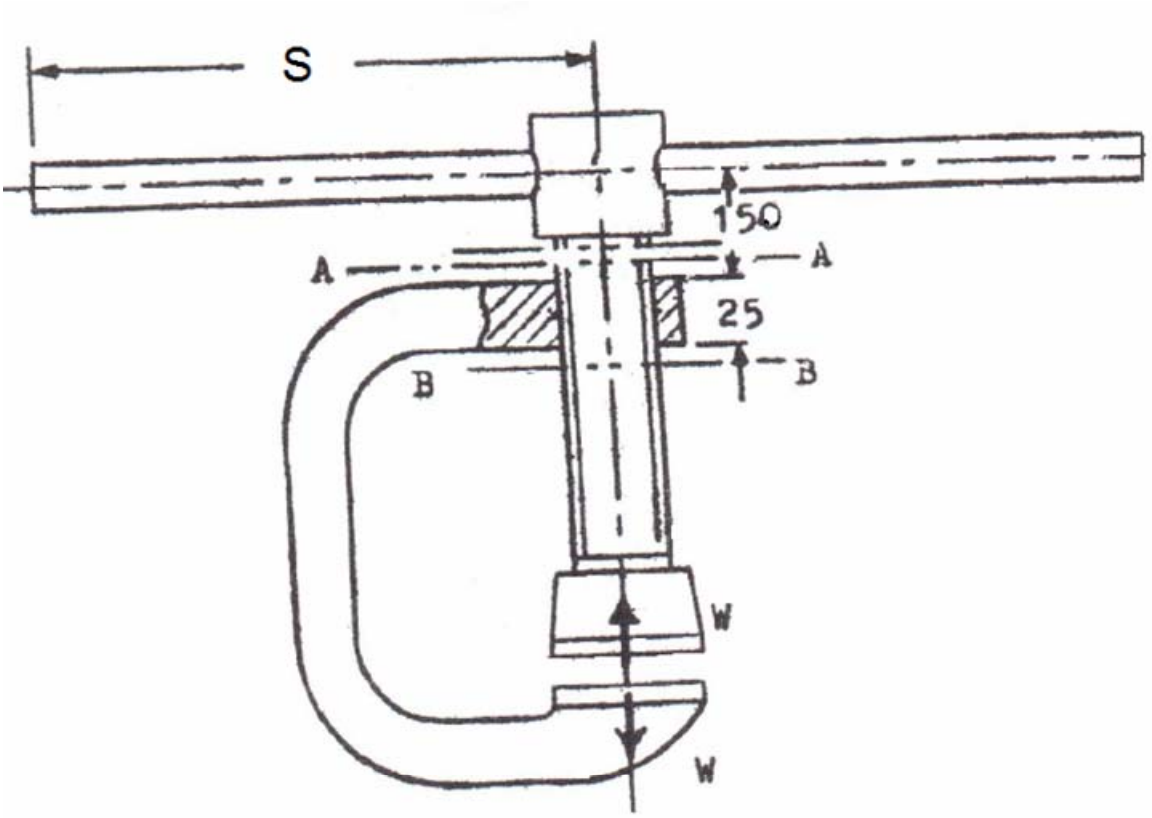
Name: R.N.:

Answer the following question:



The 70 mm double thread screw of a 10 kN shop press, shown in Figure, has an iso-trapezoidal thread. The operator's force may be taken 180 N for each hand. The mean diameter of collar is 60 mm. Determine:

a) The length S, assuming that the coefficient of friction is 0.12 in the threads and 0.125 at the collar. The inner diameter is 58 mm. The pitch is 12 mm.
b) The efficiency of the press.
c) Is the screw self-locking? Explain.
d) The maximum normal and shear Stresses in the screw.
e) The shear stress on the screw and nut threads.
f) The bearing stress in the threads.

You may use this

$$T = W\,\frac{dm}{2}\left[\frac{\pi\ \mu\ dm\ \sec\alpha + L}{\pi\ dm - \mu\ L\ \sec\alpha}\right] + \frac{\mu_c\ W\ dm_c}{2}$$