



College of Engineering & Technology

Department: Mechanical Engineering
Lecturer: Dr. Rola Afify
Course Code: ME362

Marks: 15
Time: 10:30 – 12:00
Date: 13/3/2016

Name:

R.N.:

Answer the following questions:

Question one (10 marks)

A) Define:

- Fluid:

- Specific weight:

- Specific volume:

B) Show that the equation $Q = 3.09BH^{3/2}$ satisfies the principle of dimensional homogeneity. where Q is the flow rate in m^3/s and B and H are lengths in meters.

C) Discuss Newton's law of viscosity (mention the unit of each parameter).

Question one (5 marks)

Three large plates are separated by thin layers of ethylene glycol ($\mu_{eg} = 0.0199 \text{ N.s/m}^2$) and water ($\mu_w = 0.001 \text{ N.s/m}^2$), as shown in figure. The top plate moves to the right at 2 m/s. At what speed and in what direction must the bottom plate be moved to hold the centre plate stationary?

