ESO204A Quiz#1; August 18, 2016, **A** **20minutes, 20points**

Section	Roll	Name	Signature

1. (4 points) Fig 1 shows an oil-water U-tube manometer, open to atmosphere. Find the value of h (in cm) where H = 80cm, SG_{oil} = .8

DO NOT show your calculations, write the answer only

Answer: h (in cm) =

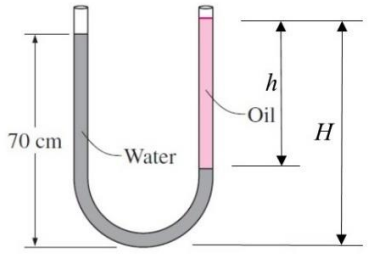

Figure 1. Oil-water U-tube manometer

2. (4 points) For the following flow field find the acceleration of a particle at point (1,1)

$\vec{u} = ax\vec{i} + by\vec{j}$ **Answer:**

3. (2 points) Tick the correct answer(s): For unsteady flow,

a. Streaklines coincide with pathlines; none of them match with the streamlines
b. Streaklines coincide with streamlines; none of them match with the pathlines
c. Pathlines coincide with streamlines; none of them match with the streaklines
d. Streamlines, streaklines and pathlines, in general, do not match with one another

4. (4 points) Tick the correct answer(s): The position of a fluid particle in a Lagrangian system is described as:

$x = x_0 e^{kt}, y = y_0 e^{kt}$; x_0, y_0 and k are constants

a. The flow is steady
b. The flow is unsteady
c. We need more information to conclude whether the flow is steady or unsteady

5. (6 points) The gate, shown in Fig 2, is hinged at point A and the supported by a ridge at point B. For the gate width (normal to the plane of paper) of 5m, find the force at point B.

DO NOT show your calculations, write the answer only

Answer:

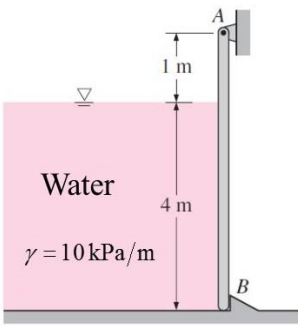

Figure 2. Gate in a freshwater channel