



MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF ENGINEERING
DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

SECOND YEAR FIRST SEMESTAR EXAMINATION FOR DIPLOMA IN CIVIL
ENGINEERING

BCECD 208 FLUID MECHANICS I

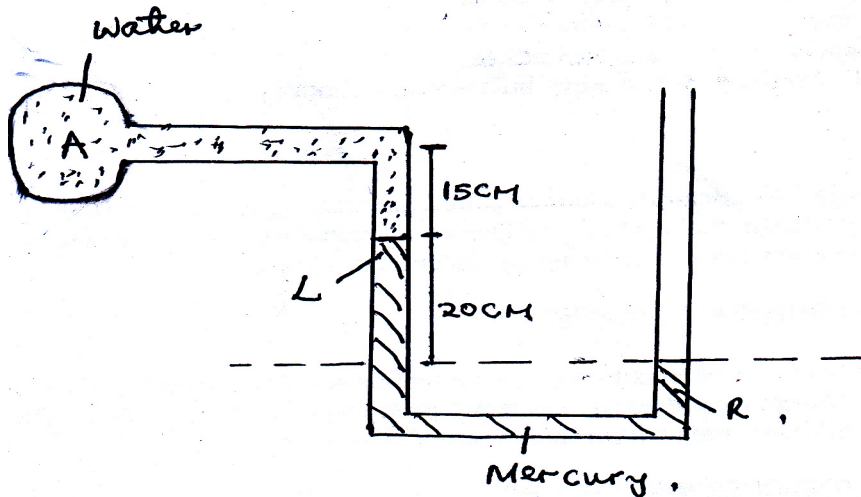
DATE:18/12/2017

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

1.
 - a) Explain two branches of fluid mechanics. (4 marks)
 - b) Differentiate the following:-
 - i. Specific weight
 - ii. Specific gravity
 - iii. Specific volume
 - c) A mercury manometer is used to measure in pipe as shown. The following liquid is water and manometer liquid is mercury.
 - i. Calculate gauge pressure at A.
 - ii. If the atmospheric pressure is 101.3 kN/m^2 , calculate absolute pressure at A.



(10 marks)

d) Explain the following types of flow.

- i Turbulence flow
- ii Laminar flow
- iii Transient flow

(6 marks)

e) A venturimeter is fitted to a 450mm diameter and has a throat of 200mm diameter. Find the quantity of water flowing when the venture head is 175mm of water. Take $c_d = 0.96$.

(4 marks)

2. a) With in aid of a sketch , explain the following pressure devices.

- i Mechanical pressure gauge
- ii Micro manometer
- iii Inverted u-tube manometer.

(10 marks)

b) With the aid of sketches, derive an expression to show that

$$P_1 = \rho g z_1 - \rho g x$$

(10 marks)

3. a) Give five assumptions of bernoullis equation.

(10 marks)

b) A siphoro has a circular of 75mm diameter and consist of a pipe with a crest 1.8m above water level discharging in atmosphere at a level 3.6m below water level.

Determine:

- i Velocity of flow
- ii Discharge
- iii Absolute pressure at crest level if atmospheric pressure is 10m of water (neglect losses due to friction).

(10 marks)

4. With the aid of a sketch derive bernoullis equation to show that

$$Z_1 + \frac{P_1}{\rho} + \frac{V_1^2}{2} = Z_2 + \frac{P_2}{\rho} + \frac{V_2^2}{2}$$

9g 2g 9g 2g

(20 marks)

5. a) Find X if the pressure difference between A and B is 0.8 Kg/cm^3

