



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

FIRST SEMESTER EXAMINATION FOR DIPLOMA IN CIVIL ENGINEERING

BCECD 208: FLUID MECHANICS

Date: 8/12/2015

Time: 8:30 – 10:30 AM

Instructions:

- This paper comprises of **five** questions
- Answer Question **one (compulsory)** carry 30 marks and any **other two** questions

1 a) Define the following terms

- fluid
- specific volume
- viscosity
- surface tension
- capillarity

(10marks)

b) A cold storage cistern is filled 3m above a 50mm diameter gate valve. Calculate

- the intensity of pressure on the gate valve
- the total pressure on the gate valve

(10 marks)

c) A liquid flows in a horizontal pipeline and gradually converges from diameter of 200mm at a position A to a diameter of 150mm at position B. if the velocity is 2m/s and the pressure head at A is 15m, calculate the velocity and pressure head at B.

(10 marks)

2 a) Define the following terms

- i. Potential energy
- ii. kinetic energy
- iii. pressure energy

(9 marks)

b) From the figure I below, calculate the pressure in A if the pressure in B is 80kN/m^2 given velocity in A $=8.5\text{m/s}$ and velocity in B $= 1.5\text{m/s}$

(11 marks)

3 a) From the figure 2 below calculate the diameter in B given the following data

Pressure in A $= 200\text{kN/m}^2$

Pressure in B $= 250.24\text{ kN/m}^2$

Flow rate $=1.57\text{ lit/s}$

(20 marks)

- 4 a) From the figure 3 below, calculate the pressure in B and C in N/m^2
Pressure in A = 2bar
Velocity in A = 10m/s
Velocity in B = 4m/s
Velocity in C = 1m/s

(20 marks)

- 5 a) State Bernoulli's theorem (2 marks)
- b) The figure 4 below shows the flow of water in a pipe line from a tank. Calculate the velocity at B

(18 marks)