



# MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)  
University Examinations for 2014/2015

## SCHOOL OF ENGINEERING AND TECHNOLOGY

### DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

#### FIRST SEMESTER EXAMINATION FOR DIPOLMA IN CIVIL ENGINEERING

#### BCE CD 208: FLUID MECHANICS I

DATE: 9/4/2015

TIME: 2 HRS

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#### *Instructions*

- *Question one is compulsory*
- *Answer any other two questions*

1. A) State two following properties of fluids
    - i) Viscosity
    - ii) Velocity
    - iii) Surface Tension
    - iv) Compressibility (4 marks)
  - c) State three types of fluid flow (3 marks)
  - d) With help of sketches illustrate three conditions of equilibrium. (6 marks)
  - e) A diver is working at a depth of 18m below the surface of sea. How greater is the pressure at their depth than at the surface given that the specific weight of sea water is  $1800\text{N/M}^3$  (3 marks)
2. Derive an equation to prove that pressure is equal in all directions. (20 marks)

3. A light solid cone with apex angle of  $60^\circ$  is of density  $K$  relative to that of liquid in which it floats with apex downwards. Determine what rate of  $K$  is compatible with stable equilibrium. (20 marks)
4. i A siphon has a uniform circular bore of 75mm and consist of a beat pipe with its crest 1.8 m above water level discharging into the atmosphere at a level 3.6 m below water level find the velocity of flow, discharge and absolute pressure at crest level if the atmospheric pressure is equivalent to 10 m of water. Neglect force due to friction. (18 marks)
- ii) State two assumptions of bernoulli's equation. (2 marks)
5. Derive bernoulli's equation. (20 marks)