



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN CIVIL ENGINEERING

DCE 2304: WATER SUPPLY

SERIES: NOVEMBER 2024

TIME: 2 HOURS

DATE: NOVEMBER 2024

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

-Pocket calculator

This paper consists of **FIVE** questions. Attempt any **THREE** questions

Do not write on the question paper

Mobile Phones are NOT allowed inside the examination room

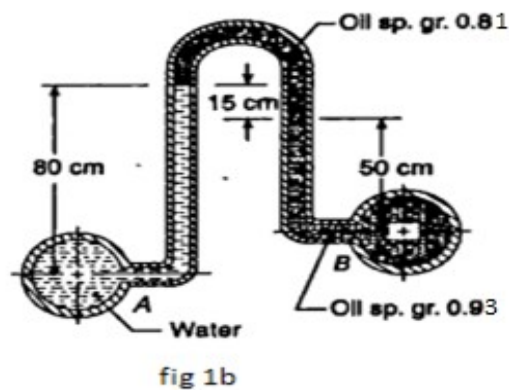
QUESTION ONE

- a) The mass of a certain liquid is 158kg. If the volume of this liquid is 200 litres, calculate the;
- Density of the liquid
 - Specific gravity of the liquid
 - Weight of 980kg of the liquid

(6marks)

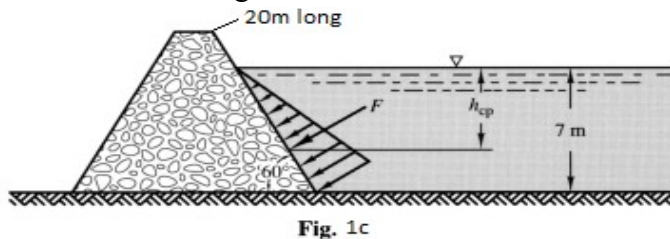
- b) An inverted differential manometer is connected to two pipes A and B as shown in fig 1b. the pressure in pipe A is 53 kN/m^3 Determine the pressure in pipe B

- In N/m^2
- In kPa
- In metres of water



(6marks)

- c) A dam is 20 m long retains 7 m of water, as shown in Fig. 1c.



Determine the

- Total resultant force acting on the dam and
- location of the center of pressure.

(8marks)

QUESTION TWO

- (a) Water is flowing through pipe as shown in fig 2a. Determine;
- The diameter of BC
 - The discharge in BC
 - The velocity in DE

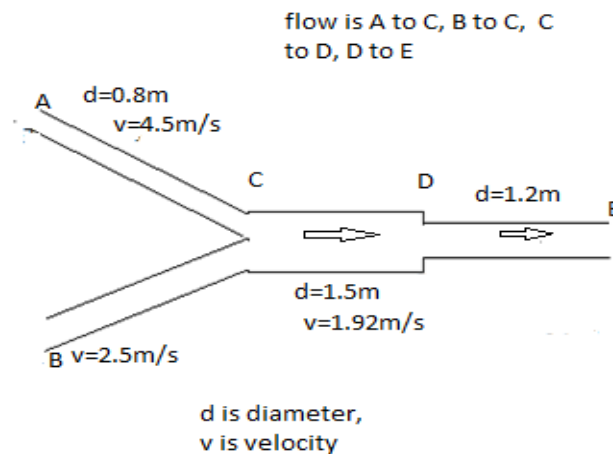


Fig 2a

(6Marks)

- b) with the aid of a sketch briefly describe the working principle of a single acting reciprocating pump

(8 Marks)

- c) A triangular channel whose sides include an angle of 60° is laid at a gradient of 1:1200. The water depth is 200mm. and Chezy's $C=52$. Determine the flow rate

(6marks)

QUESTION THREE

- a) With the aid of a sketch, briefly describe the hydrologic cycle

(8Marks)

- b) Outline ANY THREE examples of use of data derived from the study of hydrology

- (6marks)
- d) With the aid of a sketch, explain the working principle of a tipping bucket rain gauge
(6marks)

QUESTION FOUR

- a) Make a sketch of a suitable water intake from a river
(4marks)
- b) Outline the functions of the following water treatment processes
- i. Water softening
 - ii. Disinfection
 - iii. sedimentation
- (6Marks)
- c) With the aid of sketches, outline the working principle of
- i. Cascade aerators
 - ii. Multiple tray aerators
- (6 Marks)
- d) Outline TWO factors considered in selecting a dam site
(4marks)

QUESTION FIVE

- a) Explain the importance of water testing in a water treatment plant
(4marks)
- b) Differentiate the following
- i. Turbine
 - ii. Generator
- (4Marks)
- c) Sketch a USWB class A pan and show all the important dimensions
(6 Marks)
- d) Define the following terms
- i. Atmospheric pressure
 - ii. Absolute pressure
 - iii. Gauge pressure
- (6marks)