



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

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2024

TIME: 2 HOURS

DATE: AUG 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) Differentiate between Dimension and Unit of measurement and give ONE example for each

(4 marks)

- b) Define the following terms and indicate typical SI units where applicable

- i) Total pressure
- ii) Mass density
- iii) Weight
- iv) Unit weight

(8marks)

- c) An oil of specific gravity of 0.85 is under a pressure of 178 kN/m^2 . Express this as a pressure head in:

- i) Metres of water ($\rho_{\text{water}} = 1000 \text{ kg/m}^3$)
- ii) Metres of the mercury ($\rho_{\text{mercury}} = 13600 \text{ kg/m}^3$)

(4marks)

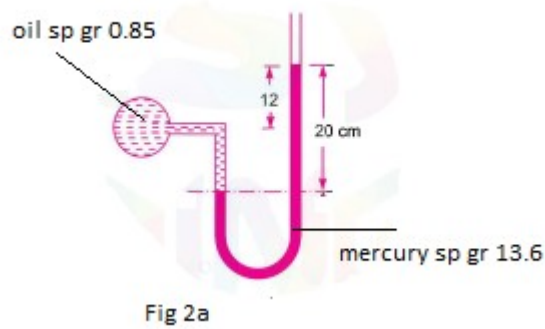
- d) Define the following terms

- i) Atmospheric pressure
- ii) Vacuum pressure

(4marks)

QUESTION TWO

- a) A simple u-tube mercury manometer is used to measure the pressure of oil of sp gr 0.85 flowing in a pipe as shown in fig 2a. determine the pressure of the oil in the pipe.



(6Marks)

- b) A triangular plate of 4m base and 4m height is immersed vertically in oil (specific gravity 0.9) with its base coinciding with the free surface of the oil as shown in fig 2b. Given that $I_{cc} = \frac{bd^3}{36}$ for a triangular plate.

Determine:

- i. The total pressure on the plate
- ii. The depth of the Centre of pressure

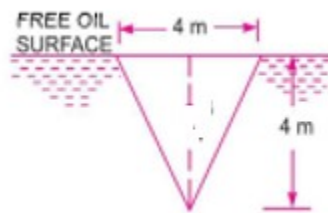


Fig 2b

(6marks)

- c) Define the following types of flow as used in pipe flow.

- i. Laminar flow
- ii. Turbulent flow
- iii. Uniform flow
- iv. Non uniform flow

(8marks)

QUESTION THREE

- a) With the aid of a sketch briefly describe the hydrologic cycle
(10Marks)
- b) Sketch a standard rain gauge and label all its parts and indicate salient dimensions
(6marks)
- c) Outline FOUR factors that affect evaporation from a water surface
(4marks)

QUESTION FOUR

- a) Outline FOUR quality requirements for drinking water
(4marks)
- b) Explain TWO main reasons for using screens in a water supply scheme
(2marks)
- c) Outline FOUR benefits of aeration in water treatment
(4marks)
- d) Outline FOUR factors considered in selecting a site for a water intake
(4marks)
- e) Outline THREE methods of disinfecting water
(6marks)

QUESTION FIVE

- a) Sketch a cascade aerator
(4marks)
- b) Briefly describe TWO methods of removing suspended particles from water
(6marks)
- c) Differentiate a pump from a turbine
(4Marks)
- d) Sketch a USWB class A pan and show all the important dimensions

(6 Marks)