

PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
UKERWE DISTRICT COUNCIL



FORM TWO MOCK EXAMINATION

031

PHYSICS

Time 2:30 Hours

Year: 2025

INSTRUCTIONS

1. This paper consists of section A, B and C with a total of ten (10) questions.
2. Answer all questions in section A, B and C.
3. Section A and C carry fifteen (15) marks each and section B carries seventy (70) marks.
4. Communication devices and any unauthorized materials are not allowed in the examination room.
5. Whenever necessary use the following constants:
 - Density of water = 1 g/cm³
 - Acceleration due to gravity = 10 m/s²
 - S.T.P means T = 273K, P = 760 mmHg
 - Density of mercury = 13.6g/cm³ = 13600 kg/m³
 - Specific heat capacity of water is 4200J/kg/K

FOR EXAMINER'S USE ONLY		
QUESTIONS NUMBER	SCORE	EXAMINER'S INITIALS
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

SECTION A (15 marks)

Answer **ALL** questions from this section

1. For each of the items i-x, choose the correct answer from the given alternatives and write the letter in the box provided

i. During a hands-on science lesson, Jelvin is unsure about the safety precautions when using a test tube. He asks, “Which direction should we point the open end of the test tube during heating?” How would you respond?

- A. Toward oneself
- B. Toward one’s lab partner
- C. Toward other classmates
- D. Away from all people

ii. In a physics class, the teacher points to a microscope resting on a desk and ask,” Why is the microscope not in motion?” What is the best explanation for this?

- A. Numerous forces are acting on the microscope, but primarily, it is inertia that prevents it from moving
- B. Gravity exert a force on the microscope. Only the microscope’s weight prevents it from sliding off the desk
- C. There is a single force, air pressure, acting on the microscope. The room’s air presses down, keeping the microscope on the desk
- D. Two force, are at play on the microscope. The desk exerts an upward force, while gravity pulls it downward. The equilibrium of these forces keeps the microscope still.

iii. A civil engineer is designing a floating bridge to span a river. The bridge will consist of pontoons that need to support the weight of the entire structure. The engineer wants to ensure that the bridge remains buoyant and stable. Which of the following design considerations is most aligned with Archimedes’ principle?

- A. Increasing the mass of the pontoon to enhance stability
- B. Reducing the volume of water displaced to minimize buoyant force
- C. Increasing overall weight of the bridge for better grounding
- D. Designing pontoons that displace a greater volume of water

iv. Bunji is reading a book about scientific phenomena and comes across Brownian motion. He's curious about the cause of this motion. What is the most accurate reason for the movement of particles in Brownian motion?

- A. Gusts of wind
- B. Atoms and molecules
- C. Sound waves
- D. Light waves

v. Batuli is visiting an aquarium and is captivated by the fish swimming at different depths. She wonders about the properties of water pressure in the tanks. Which of the following statements is not accurate regarding the pressure at a given depth in a fluid?

- A. Is equal in all directions
- B. Is independent of the shape of the container
- C. Acts at right angles to the surface containing the fluid
- D. Depends on the area of the surface

vi. Sia is in her physics class, learning about energy conservation and work. She is fascinated by how energy relates to everyday scenarios. Which statement describes the relationship between the energy of an object and the work done on it in everyday situations?

- A. Work is needed for an object to keep a constant kinetic energy
- B. Work is needed for an object to keep a constant potential energy
- C. Increasing the kinetic energy of an object increases the amount of work needed to stop it
- D. Increasing the potential energy of an object decreases the amount of work needed to stop it

vii. A person has an urgent message to send to his friend. Which exactly means can be used as quickly as possible?

- A. Handline and mobile phone
- B. Microphone and telephone
- C. Megaphone and telephone
- D. Megaphone and microphone

viii. A teacher while teaching, taught students that the temperature of a place changes according to the environment and they all measured the temperature of Dar es Salaam town as 32°C . This is equivalent to _____

- A. 306k
- B. 241k
- C. 305k
- D. 205k

ix. When a plastic pen is rubbed against dry hair, the pen attracts small pieces of papers. This implies that _____

- A. The hair become negatively recharged
- B. The hair gain electrons
- C. Pen loses electrons
- D. The hair become positively recharged

x. A man looked his face on unsilvered part of plane mirror, the image formed. What are the characteristics of image formed among the following?

- A. Real and laterally inverted
- B. Virtual and laterally inverted
- C. Real and magnified
- D. Virtual and diminished

ANSWER

i	ii	iii	iv	v	vi	vii	viii	ix	x

2. Match the descriptions of the terms used in forces in **List 'A'** with the corresponding concepts used in forces in **List 'B'** by writing a letter of the correct response below the item in the table provided

LIST A	LIST B
(i) Effect of magnet on iron material	A. Torsional force
(ii) Resistance of a fluid to flow	B. Tension
(iii) Effect of twisting a soft metal such as a wire	C. Weight
(iv) Effect transmitted through a string	D. Friction
(v) Effect of opposition causing tear and wear	E. Viscosity
	F. Nuclear force
	G. Attraction
	H. Extension

ANSWER

i	ii	iii	iv	v

SECTION B (70 MARKS)

Answer all questions in this section

3. a) Explain why ship floats while the coin sinks in a sea water. Three (03) points

- i. _____
- _____
- ii. _____
- _____
- _____
- iii. _____
- _____
- _____

b) An object was weighed in space and recorded as 18N and then immersed in the water and it experienced an upward force of 2N. Estimate the following

i. Real weight

ii. Relative density

iii. Density of the object in kg/m^3

4. a) Analyse three conditions for the body to be in equilibrium.

- i. _____

- ii. _____

- iii. _____

b) A uniform half meter rule is freely pivoted at 15cm mark and balances horizontally when a body of 40g is hung from a 2 cm mark

- i. Draw a clearly labelled diagram to illustrate the forces on a half metre rule

- ii. Calculate the mass of the rule

- iii. If the Vernier calliper used to measure/record the thickness and width of half meter rule which are 2cm and 4cm respectively. Determine the density of material used to make that half metre rule.

5. a) Why a big elephant manages to walk comfortably on muddy soil without sinking while a human being may sink easily

b) Briefly explain any two applications of hydraulic press in daily life.

- i.

- ii.

c) i) Explain with the help of diagram that pressure in liquid depends on depth

ii) Why dams are constructed thicker at the bottom than at the top.

6. a) i) Differentiate ferromagnetic materials from paramagnetic materials by giving typical examples and uses

b) In a practical situation, identify four real-life applications of magnets that can be useful in your school, home or community

- i.

- ii.

- iii.

- iv.

c) Your tem notices that after several uses, some magnets are lost their strength. Suggest four appropriate ways to store magnets to prevent them from losing their magnetic power

- v.

- vi.

- vii.

- viii.

7. Imagine you are an electrical engineer working on designing a backup power system for a mobile medical clinic in a remote area. You have a capacitor of $200\mu\text{F}$. And its charged to potential difference of 10V in this critical medical setting you need to determine.

a) How much charge is accumulated in the capacitor which will help you to understand the capacity of the backup power source

b) The energy stored in the capacitor allowing you to assess how long the clinic can operate on this stored energy in case of a power outage

8. You are tasked with designing the lighting system for a stage performance. You have two lamps with different resistances one having higher resistance than the other.

a) If you decide to connect these lamps in parallel to area the stage lighting, which lamp will be brighter (i.e dissipate more power)

b) Alternatively, if you choose to connect the lamps in series which lamp will be brighter in this configuration?

9. a) Briefly explain why a drop of honey on a glass sheet remains spherical while a drop of water spread faster.

b) A group of form one students failed to correctly define key scientific terms after a Physics lesson. As a knowledgeable student, use your understanding to assist them by providing clear and accurate definition of the following terms

i. Brownian motion

-
-
-
- ii. Kinetic theory of matter
-
-
-
- c) i) What is the relationship between tension and extension of loaded elastic material
-
-
-
-
- ii) State law that governs the above
-
-
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SECTION C 15 MARKS)

Answer question number 10

10. a) Draw the current symbol of each of the following electric components

Name	Current symbol
i) A dry cell	
ii) A battery consisting of two cells	
iii) Switch or key	
iv) A lamp or bulb	
v) Ammeter	
vi) Voltmeter	

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b) By using connecting wires, construct a simple electric current involving a dry cell, a lamp, a switch, an ammeter and voltmeter