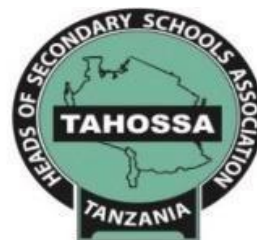




THE PRESIDENT'S OFFICE – RALG
TAHOSSA ROMBO DISTRICT EXAMINATION SYNDICATE
FORM FOUR MOCK EXAMINATION



031/1

PHYSICS 1**TIME: 3:00 Hours****August, 2024****Instructions**

1. This paper consists of section **A, B** and **C** with the total of **eleven (11)** questions.
2. Answer all question in section **A** and **B** and **two** questions in section **C**.
3. Cellular phone any unauthorized materials are not allowed in examination room.
4. Non - programmable calculator and mathematical table are allowed in examination room.
5. Write your Examination Number on every page of your answer booklet(s).
6. Where necessary the following constants may be used:
 - ❖ Acceleration due to gravity $g=10\text{m/s}^2$
 - ❖ Specific heat capacity of water = 4200Jkg^{-1}
 - ❖ Speed of light in air = $3 \times 10^8 \text{ ms}^{-2}$
 - ❖ Speed of sound in air = 340ms^{-1}
 - ❖ Pie $\pi=3.14$

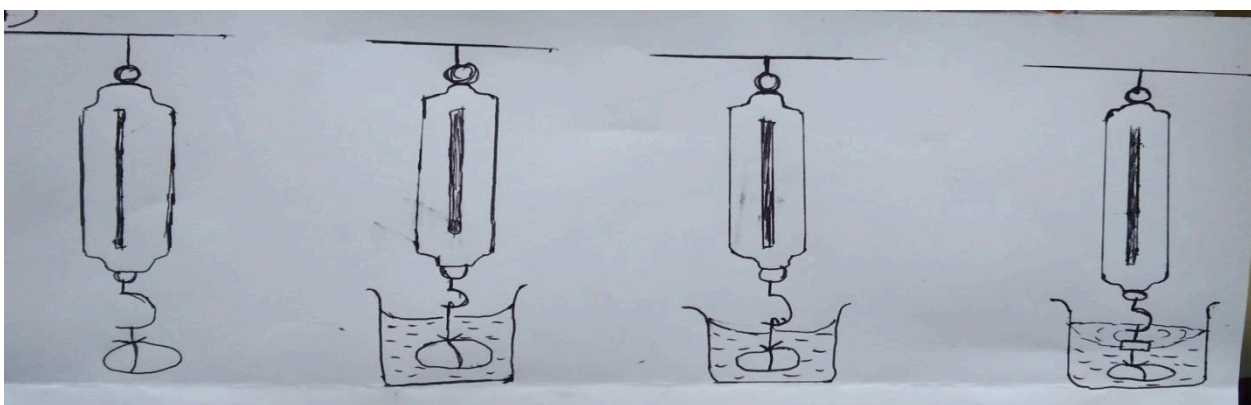
FOR ASSESSOR'S ONLY		
QUESTION NUMBER	SCORE	MARKER'S INITIALS
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
TOTAL		
CHEKER'S INITIALS		

SECTION A: (16 MARKS)

Answer **ALL** questions in this section

1. For each of the items i-x choose the correct answer among the given alternatives and write its letter beside the item number (10 marks) @ 1 mark)

- i. The diagram below shows the series of experiment performed by a student to determine the relative density of a cork that floats in water four readings of the spring balance were obtained.



The relative density of the cork is given by.

A: $\frac{W1}{W1-W2}$

B: $\frac{W2-W2}{W3-W2}$

C: $\frac{W3-W2}{W3-W4}$

D: $\frac{W3-W1}{W3-W4}$

E: $\frac{W3}{W3-W4}$

- ii. Diffusion occurs more quickly in a gas than in a liquid because.

A: The liquid contains a layer on its surface.

B: The gas contains semi- permeable membrane.

C: The gas molecules is small in size compared to the liquid molecules.

D: The adhesion is larger than cohesion in gas compared to the liquid molecules.

E: The speed of molecules in gas is greater than in liquid.

- iii. In a loading a lorry a man lifts boxes each of weight 100N through a height of 1.5m, if he lifts 4 boxes per minute, the average power the man is walking is.

A: 100W

B: 10W

C: 600W

D: 37.5W

E: 2250W

- iv. In a process of charging by induction in static electricity.

A: A conductor is rubbed by an insulator.

- B: A charge is produced by friction.
- C: Negative and positive charge are separated.
- D: A positive charge induces positive charge.
- E: Electrons are sprayed into an object.

- v. A magnetic needle, free to turn in a vertical plane, is suspended first at the earth's South magnetic pole and then at a point on the magnetic equator. The respective Angle between the needle and horizontal are: -
A: 0° and 0° B: 70° and 70° C: 0° and 45° D: 0° and 90° E: 90° and 0° .
- vi. What does the term milky way mean?
 - A. A vast collection of asteroids
 - B. One of the galaxies of the universe
 - C. A group of stars that form a pattern in the sky
 - D. One of the meteoroids
- vii. Which of these resources of energy is non- renewable?
 - A: Ocean waves
 - B: Water
 - C: Solar radiation
 - D: Fossil fuel
- viii. A typist uses a new carbon paper under her top typing paper for making a copy of a letter, When she holds the carbon paper close to a plane mirror, she can read the letter thin is because the mirror.
 - A: Forms the image the same size as object.
 - B: Produces the inverted image
 - C: Produces the laterally image
 - D: Forms a virtual image
 - E: Forms an image behind the mirror.
- ix. Light wave differs from sound wave because: -
 - A: Light is an electromagnetic wave.
 - B: Light wave are long and sound wave are short.
 - C: Interference is obtained with light waves but not with sound waves.
 - D: The speed of light is independent of the medium in which it travels.
 - E: Sound wave do not travel in water.

- x. The layer of the Atmosphere where weather phenomena are formed is;
 A: Stratosphere
 B: Magnetosphere
 C: Troposphere
 D: Thermosphere
 E: Exosphere

2. Match the items in List A with the responses in List B by writing the letter of the corresponding response beside the item number in the Answer sheet provided (6 marks) @1

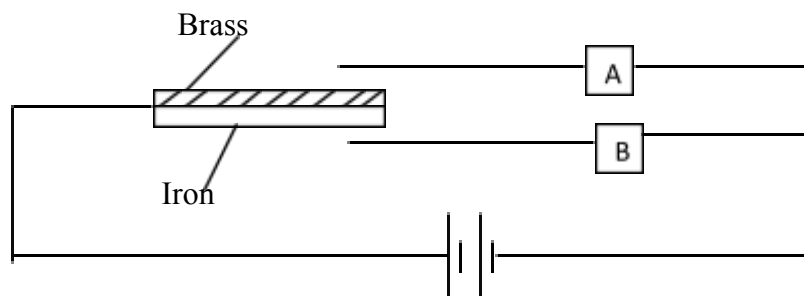
List A	List B
i. Longitudinal wave	A. $\sin r$ over $\sin i$
ii. Reverberation	B. Refractive index
iii. Snell's law	C. Water waves
iv. Critical Angle	D. Sound waves
v. Principle of superposition	E. Angle of incidence for which the refractive is 90°
vi. Mirage	F. Rise and fall of sounds of two vibrating objects
	G. The resultant displacement at any point is equals to the sum of displacements of different waves.
	H. The multiple reflection of sound waves.
	I. Angles of a reflection for which the angle of incidence is 90°
	J. The effect of total internal reflection.

SECTION B: (54 MARKS)

Answer **all** question in this section

3. (a)(i) Explain why convex lens is used as a driving mirror. (2marks)
 (ii) Determine how a lens camera operates the same as human eye give three points (3 marks)
- (b) A compound microscope consists of the objective lens and eyepiece lens of focal length 12cm and 4cm respectively. The two lenses are separated by a distance of 30cm. The microscope is focused so that the image is formed at infinity. Determine the position of the object. (4marks)

4. (a) A uniform half metre rule is balanced at 15cm mark when a load of 0.4N is hanging at the zero mark. Draw a sketched diagram indicating the arrow of the weight of the rule acting through the center of gravity hence determine the weight of the half meter rule. (5.5 marks)
- (b) A screw jack has a screw pitch of 5mm and the effort arm of 16cm. Determine the percentage efficiency of this screw jack, if it needs an effort of 30N to lift a load of 750N (3.5 marks).
5. (a) The half-life of radioactive material is 8 days, at the beginning the sample contain 800g, How much sample will remain un decayed after 40 days.(4.5marks)
- (b) In a closed pipe the first resonance is at 23cm and second at 73cm. Determine the wavelength, end correction, first and second overtones(4.5marks)
6. (a) A dam walls constructed thicker at the bottom than at top. Explain the phenomenon by an appropriate formulae (3marks)
- (b) A pressure cooker will cook beans faster than open saucepan. Give Explanation on these observation (2marks)
- (c) An insulated cup holds 0.3kg of water at 0°C. 0.2kg of boiling water at standard pressure is poured into the cup. What will be final temperature? (04marks)
7. (a) The diagram below show the Bimetallic thermostat used to regulate a cooler and heater in a class room. It consists a brass of a linear expansivity $18.9 \times 10^{-4} \text{ K}^{-1}$ and iron of linear expansivity $10.2 \times 10^{-4} \text{ K}^{-1}$. To keep the temperature in the room constant. Which of the two devices A and B could be the heater? Explain your answer (06 marks)

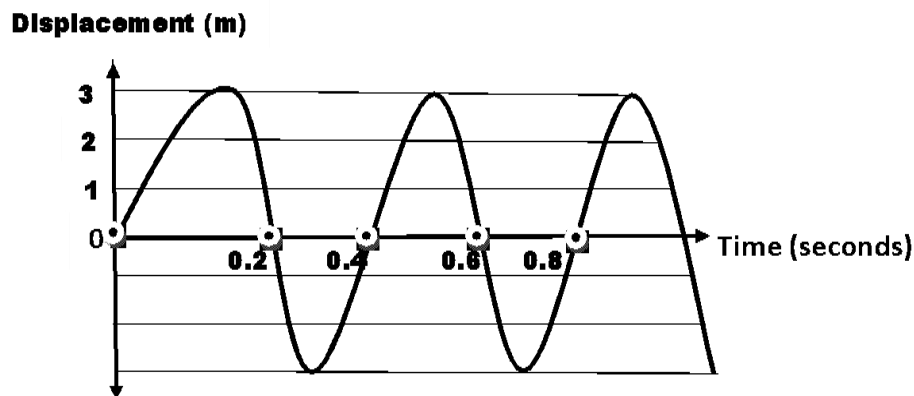


- (b) Three Beakers are identical size and shape. One Beaker is painted matt black, one is dull white and one is gloss white. The beakers are filled with boiling water. In which beaker will the water cool most quickly? Give reason (03 mark)
8. (a) Explain the effect of volcanic eruption 5 points (5marks)
- (b) Name four gases that contribute to green house effect. (4marks)

SECTION C: (30 MARKS)

Answer **two** questions in this section

9. (a) A boy has a larger number of coloured bulbs labelled 240v and 60w, he wishes to use decoration so that the bulbs operate normally. How many can he connect to a 240v and 5A fuse? (03 marks)
- (b)(i) You are required to use 3Ω resistor in your electric circuit unfortunately there are only 2Ω resistors in school physics laboratory. How could you design the required resistors from available resistors? (03 marks)
- (ii) A 220V main transformer has 1000 turns in primary and turns in the secondary. It is used to supply energy to a 12v, 24W lamp. What is the efficiency of transformer if the current drawn from 220V? (4 marks)
- (c) (i) Describe how x- ray are produced? (3marks)
(ii) Explain four (4) uses of x-rays (2 marks)
10. (a) A piano wire and a tuning fork produce different note the same and beats are heard. What could be done on piano wire in order emit a note of the same frequency as vibrating fork. Give three points (05 marks)
- (b) A graph below shows a wave emitted by the electromagnet source. If the velocity of the wave is 12m/s determine the frequency and wavelength of the wave. (5marks)



- (c) Boats use “Sonar” to detect the depth of water in the seas or lacks. A sonar pulse sent out by a boat arrives back after 3 seconds. If the speed of sound in water is 1500m/s. How deep is the water (05 mark)
11. (a) Why some semiconductors called “P” type and other “N” type? (06 mark)
- (b) Describe, how will you connect the semiconductor diode as forward bias (05 marks)

(c) The diagram below shows a puzzle box contains two lamps and simple components so that when T_1 is connected to the anode lamp L_1 lights but when terminal T_2 is connected to the anode, lamp L_2 light. Suggest what the puzzle box is and now the connection is made (04 marks)

