THE UNITED REPUBLIC OF TANZANIA
THE PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

FORM TWO EXAMINATION
031 PHYSICS

Time: 2½ Hours

INSTRUCTIONS

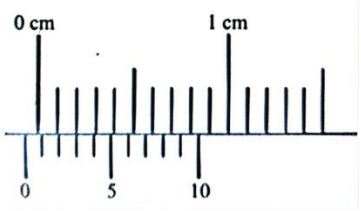
1. This paper consists of sections **A, B** and **C** with a total of ten (10) questions
2. Answer **ALL** questions
3. Cellular phones and any authorized materials are not allowed in the examination room
4. Where necessary the following constants may be used
   (a) Acceleration due to gravity, g =10ms^{-2} OR g = 10N/kg =0.01N/g
   (b) π = 3.14

Question number	**For examiners use only**	
	score	Examiner's initials
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
TOTAL		
CHECKER'S INITIALS		

SECTION A (15 Marks)

1. For each of the items (i) – (x), choose the correct answer from among the given alternatives and write its letter beside the item number in the answer booklet provided.

(i) What is the zero-error shown in the figure below?



A. 0.3mm
B. 0.7mm
C. -0.3mm
D. -0.7mm

(ii) A rod of insulating material is given a positive charge by rubbing it with a piece of fabric and the fabric is then tested for electric charge. you would expect the fabric to have:

A. A positive charge equal to that on the rod
B. A negative charge equal to that on the rod
C. A positive charge less than that on the rod
D. A negative charge greater than that on the rod

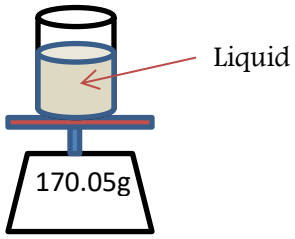
(iii) Suppose you wanted to make strong permanent magnets, which of the following materials would you select?

A. Cobalt and iron
B. Copper and cobalt
C. Copper and nickel
D. Nickel and Cobalt

(iv) A person measures a length, width, height, and mass of a rectangular metal block. Which of these measurements must be used in order to calculate the density of the metal?

A. Mass only
B. Height and mass only
C. Length, width and height only
D. Length, width, height and mass

(v) The figure below shows the equipment used to determine the density of a liquid. Which formula can be used to accurately determine the density of the liquid?



A. $\frac{Mass\ of\ beaker\ and\ liquid - mass\ of\ beaker}{volume\ of\ liquid}$

B. $\frac{Mass\ of\ beaker\ and\ liquid - mass\ of\ liquid}{volume\ of\ liquid}$

C. $\frac{volume\ of\ liquid}{Mass\ of\ beaker\ and\ liquid - mass\ of\ liquid}$

D. $\frac{volume\ of\ liquid}{Mass\ of\ beaker\ and\ liquid - mass\ of\ beaker}$

(vi) Students were required to choose the statement which clearly gives the reason for a body to float in fluid. Which one of the following statements they were supposed to choose?

A. because its density is greater than the density of the fluid displaced;
B. because its density is less than the density of fluid;
C. because the weight of the fluid displaced is equal to its weight;
D. Because the weight of the fluid displaced is less than its weight.

(vii) The magnetic material can be magnetized in three different ways namely

A. Stroking, burning, and electrical methods
B. Stroking , electrical and induction methods
C. Burning , induction ,and hammering methods
D. Hammering, burning and demagnetizing methods

(viii) Two coils of a wire of resistance 2 ohms and 3 ohms respectively are connected in series with a 10 volt battery. The current passing through the 2ohms coil in ampere is:

A. 0.5A B . 2A C . 5A D . 20 A

(ix) Which of the following describes particles in a solid at room temperature?

A. Close together and stationary.
B. Close together and vibrating.
C. Close together and moving at around random
D. Far apart and moving at random

(x) A machine is able to lift a load of 200kg vertically to a height of 30 m above the ground in 5 seconds. This implies that the power of the machine in kilowatt is

A. 0.12 B.12 C. 120 D. 3 E. 1.2

Answer

i	ii	iii	iv	v	vi	vii	viii	ix	x

2. Match the items in list A with responses in list B by writing the letter of correct responses.

List A	List B
(i) Ammeter (ii) V∝ I (iii)Rheostat (iv)Series connection (v) Charge	A. Measures p.d B. Measures current C. Ohms symbol D. Controls current E. Ohms law F. Controls p.d G. Coulombs H. Constant current I. Constant p.d J. Galvanometer K. Current is not constant

List A	i	ii	iii	iv	v
List B					

SECTION B (70 Marks)

Answer all questions from this section

3. (a) Mention four properties of images formed by plane mirrors

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(b) State two laws of reflection of light

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4. (a) Briefly explain why it is not advised to stand near mountains, trees and tall houses during lightning?

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(b) After a long flight a plane may be charged

(i) What causes the charge?

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(ii) Why are passengers in the plane not charged, but an attendant who immediately opens the door from outside after the landing of plane is at risk?

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5. (a) Why there is no work done on the books when carried horizontally?

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(b) A garage hoist lifts a truck up 2 meters above the ground in 15 seconds. Find the power delivered to the truck given that the mass of the truck is 1000 kg .

6. (a) Name two scales of vernier calipers and explain how it is used in measuring a length correct up to 0.01 cm.

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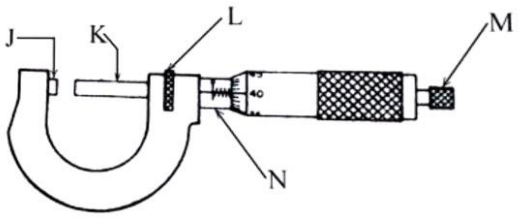
(b) Read the figure below and answer the asked questions:



(i) Identify the instrument
(ii) Name the labeled parts of the instrument
(iii) State the function of the instrument

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7. (a) State the law of buoyancy.

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(b) An iron piece of mass 360g and density of 7.8 g/cm^3 is suspended by a rope so that it is partially submerged (half-way) in oil of density 0.9g/cm^3.Find tension in the string.

8. (a) The sinking of the wheels of a lorry into soft sand may be prevented by letting off some air from the tyres. Explain this observation**.**

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(b) A car of mass 8000 kg has one of its tyres having an area of 50 cm^2 in contact with the ground. If this is four-wheel drive vehicle, calculate the pressure exerted on the ground by the car.

9. (a) (i)What is laterally inversion?

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(ii) An object is placed 2 cm from a plane mirror. If the object is moved 1cm towards the mirror, what will be the new distance between the object and the image?

(c) Two shaving mirrors were place at an angle of 60^0. Find the number of images that might be formed on a plane mirror.

SECTION C (15 Marks)

10. (a) What are the four main components of an electric circuit?

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(b) Explain why when the bulbs are installed parallel to each other are brighter than when they are in series.

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(c) Find the current that passes through the 6Ω and 12Ω and potential difference across 4Ω