

Candidate's Examination Number.....

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
FORM TWO NATIONAL ASSESSMENT

031

PHYSICS

Year: 2024

Time: 2:30 Hours

Instructions

1. This paper consists of sections A, B and C with a total of **ten (10)** questions.
2. Answer **all** the questions in each section.
3. All answers must be written in the spaces provided.
4. All writing must be in **blue** or **black** ink, **except** drawings which must be in pencil.
5. Communication devices and any unauthorized materials are **not** allowed in the assessment room.
6. Write your **Assessment Number** at the top right corner of every page.
7. Where necessary the following constants may be used:
 - (i) Acceleration due to gravity, $g = 10 \text{ m/s}^2$.
 - (ii) $\pi = 3.14$

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



SECTION A (15 Marks)

Answer all questions in this section.

1. For each of the items (i) – (x), choose the correct answer from the given alternatives and write its letter in the box provided. (10 marks)

(i) Which sets of equipment represents the application of Physics in schools?

- A Voltmeter, tongs and tripod stand
B X-rays, ct-scanner and ultra sound
C Cooking pans, binoculars and mosquito coils
D Fax machines, air planes and train

(ii) How would you immediately stop hazards due to the electric faults?

- A Remove the plugs
B Switch off the socket key
C Cut off all connecting wires
D Switch off the main switch

(iii) Both density and relative density are physical quantities. How do they differ?

- A Density is a basic quantity while relative density is a derived quantity
B Density has units but relative density has no units
C Density has no units while relative density has units
D Density is a derived quantity while relative density is a basic quantity

(iv) Why do scientists prefer sending the rocket to Mars from the Moon rather than from the Earth?

- A The gravitational attraction of the moon is large than the earth
B The moon's shape is smooth compared to the earth
C The moon is at higher position compared to the earth
D The gravitational constant of the moon is less than that of the Earth

(v) A body weighs 0.52 N in air. It weighs 0.32 N when it is totally immersed in water and 0.36 when totally immersed in another liquid. What is the density of the other liquid?

- A 1.25 g/cm^3
B 0.8 g/cm^3
C 80 kg/m^3
D 3250 kg/m^3

(vi) Why gases are easily compressed when compared to liquids?

- A Molecules in gas are much further apart than those in liquid.
B Molecules in gas are free to move than those in liquid.
C Molecules in liquid move over a short distance.
D Molecules in liquid are larger than those in gas.

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(vii) Why are the walls of a dam made thicker at the bottom than at the top?

- A Weight of water at the bottom is less
- B Pressure of water at the bottom is less
- C Weight of water at the bottom is greater
- D Pressure of water at the bottom is greater

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(viii) Which one is a natural source of light?

- A Electrical bulbs
- B Lightning
- C Candles
- D Torch

☐

(ix) Which statement is true about a body whose work done is zero?

- A Its displacement is in the opposite direction to the force applied
- B Its displacement is in the same direction as that of the applied force
- C Its displacement is in a direction perpendicular to the applied force
- D Its displacement is at an angle to the direction of the applied force

☐

(x) What is the SI unit of the capacitance?

- A Coulomb
- B Ampere
- C Farad
- D Volts

☐

2. Match the descriptions in **List A** with the name of its corresponding concept related to motion in straight line in **List B** by writing a letter of the concept below the item number in the table provided. (5 marks)

List A	List B
(i) The distance covered by an object in a given direction in metres.	A Acceleration
(ii) The length of the path that is followed by an object and has a magnitude only.	B A frame of reference
(iii) A set of axes from which an observer can measure the position of points in a system.	C A position
(iv) The rate of change in displacement measured in metres per second.	D Average speed
(v) The rate of change in velocity.	E Displacement
	F Distance
	G Maximum altitude
	H Velocity

Answers

List A	(i)	(ii)	(iii)	(iv)	(v)
List B					

SECTION B (70 Marks)

Answer **all** questions in this section.

3. (a) Mention four types of magnets according to their shapes. (4 marks)

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- (b) Write a limitation and two precautions of using the glass float thermometer. (3 marks)

Limitation

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Precautions

- (i)
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-
- (ii)
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- (a) Why does a person falls in the direction of a slow moving car if he/she jumps from it? (2 marks)

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(6 marks)

- (b) Give three properties of magnetic lines of force.

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4. (a) (i) What are the three temperature scales that are commonly used?

(3 marks)

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- (ii) Which liquid would you use to construct a simple liquid-in-glass thermometer using mercury, alcohol and water as thermometric liquids? Give a reason for your answer.

(4 marks)

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- (b) Briefly explain two examples that show the applications of Newton's third law of motion in real life situations. (3 marks)

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- (c) Why action and reaction forces do not cancel each other? (5 marks)

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6. Suppose a bird is on top of a tree and a boy who is at rest throws a stone to hit it such that the bird falls and strikes the ground with a velocity of 80 m/s : (5 marks)

(a) Determine the height of the tree from the ground to its top.

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(b) Calculate the time taken by the bird to hit the ground. (5 marks)

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7. (a) Outline four types of simple machines. (4 marks)

(i)

(ii)

(iii)

(iv)

(b) The block and tackle pulley system has a velocity ratio of 4. If a load of 225 N is raised by using a force of 75 N; Determine:

(i) The mechanical advantage of the system. (3 marks)

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(ii) The efficiency of the system. (3 marks)

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8. (a) Why is it important to keep the centre of gravity of a motor-bus as low as possible? (2 marks)

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- (b) Your Physics teacher has assigned you to determine the weight of a meter rule using the concept of forces in equilibrium.

- (i) Name three types of materials which should be used in the task given. (3 marks)

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- (ii) With a aid of a diagram, explain how you will determine the weight of the meter rule. (5 marks)

- (i) What do you understand by the term geothermal as a source of energy. (3 marks)

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- (ii) Outline four steps in which electricity is produced from geothermal energy. (4 marks)

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- (b) In three points, give the disadvantages of wind energy. (3 marks)

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SECTION C (15 Marks)

Answer question **ten (10)**.

10. Suppose you are a Physics laboratory leader and you are asked by your teacher to prepare the electrical components and instruments for an experiment to determine the relationship between voltage and current:

- (a) List down five electrical components which will be used in this experiment. (5 marks)

(i)

(ii)

(iii)

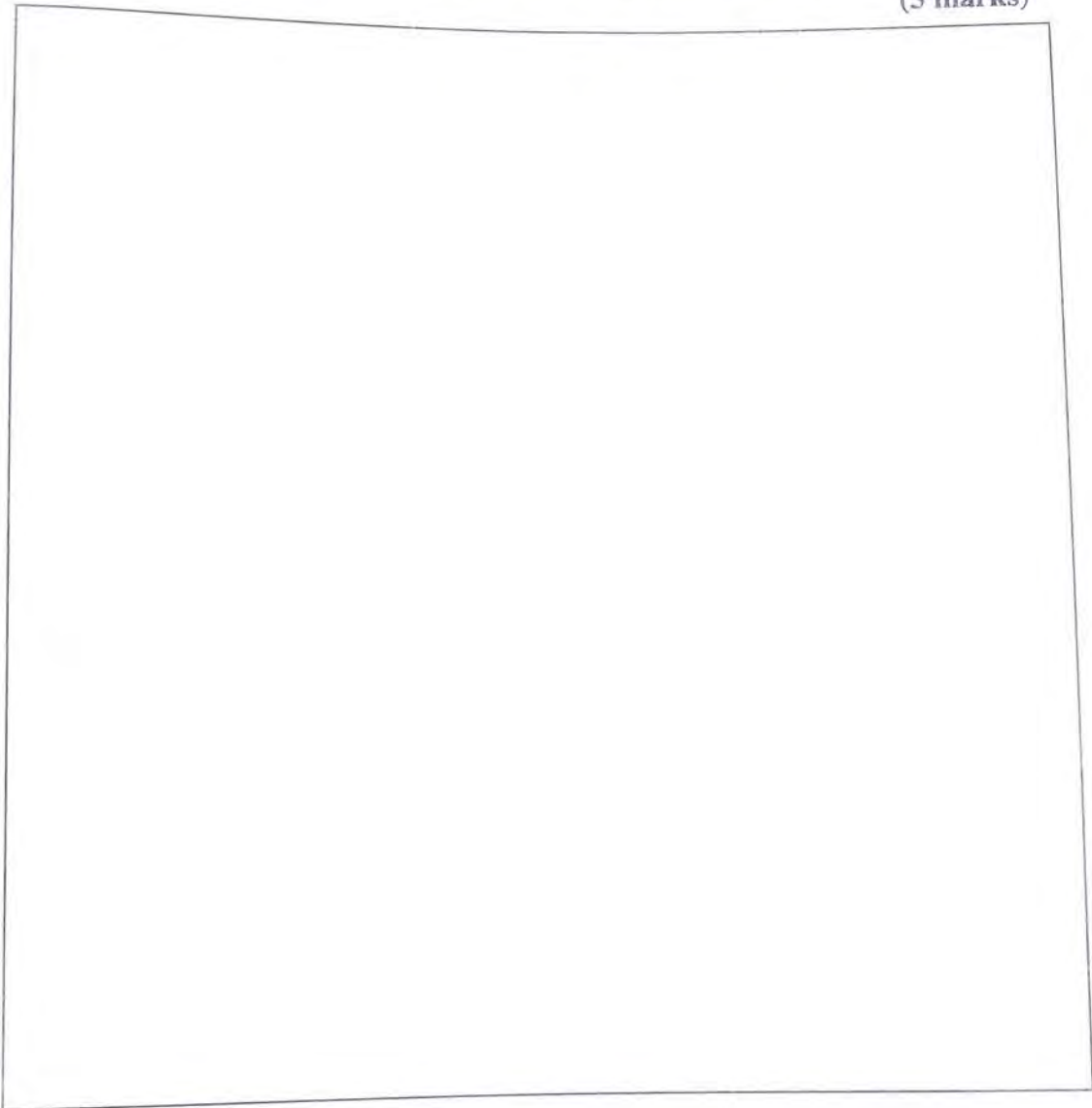
(iv)

(v)

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- (b) Draw a simple electric circuit which will be suitable for that experiment.

(5 marks)



- (c) Using the simple electric circuit drawn in 10 (b), state the criteria used to connect the ammeter and voltmeter electrical components in the circuit.

(5 marks)

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