Candidate's Examination Number.....

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

031 **PHYSICS**

Time: 2:30 Hours **Year: 2024**

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, $g = 10\ m/s^2$.
   (ii) $\pi = 3.14$

FOR ASSESSOR'S USE ONLY		
QUESTION NUMBER	**SCORE**	**ASSESSOR'S INITIALS**
1		
2		
3		
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TOTAL		
CHECKER'S INITIALS		

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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.

(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

(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 thermometer.
(3 marks)

Limitation

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Precautions

(i) .....

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(ii) .....

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7 (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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(b) Give three properties of magnetic lines of force. **(6 marks)**

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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) .....

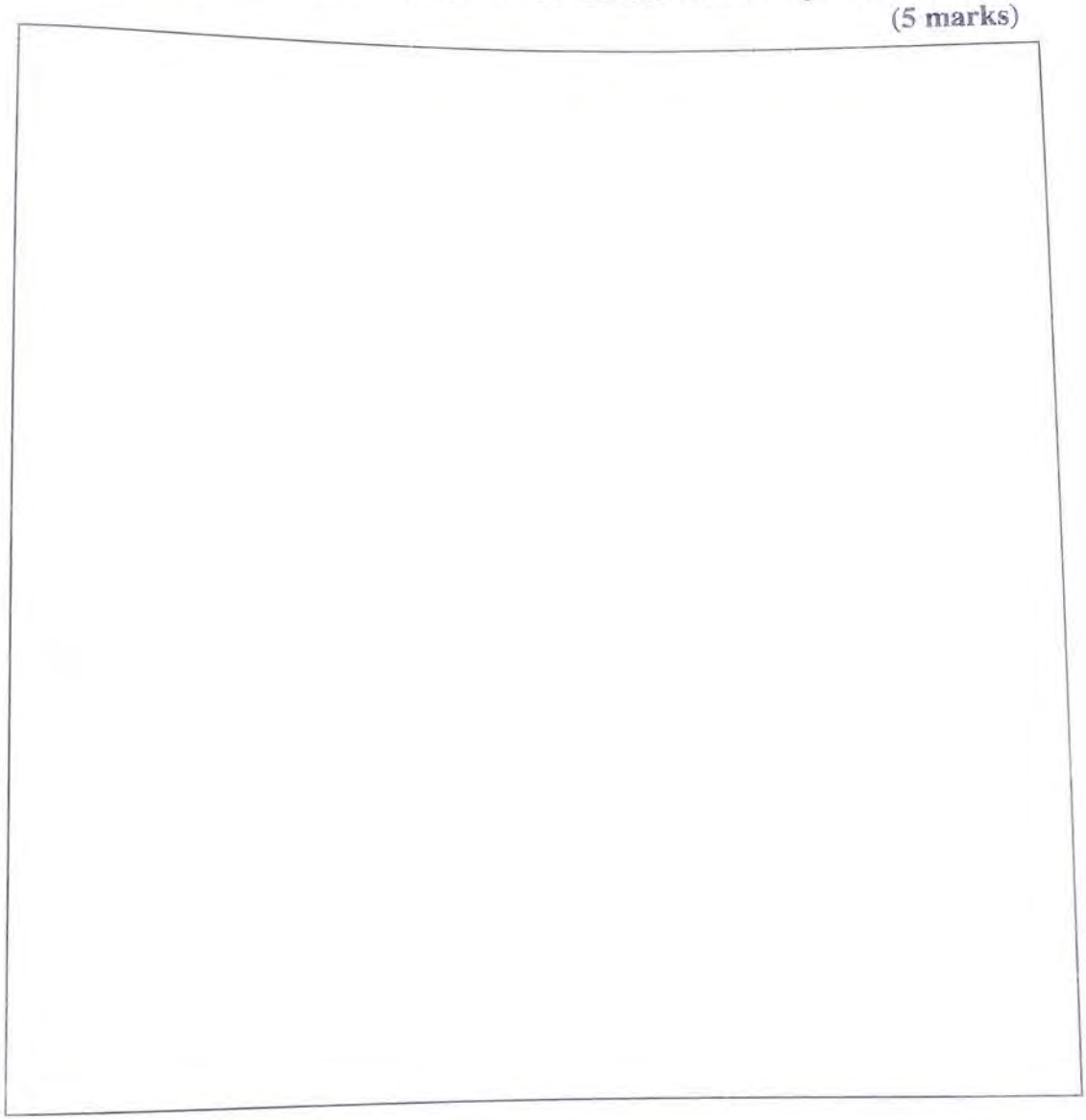
(iv) .....

(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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