Candidate's Examination No ……

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

031 **PHYSICS**

Time: 2:30 Hours **Friday, 15th November 2019 a.m.**

Instructions

1. This paper consists of sections A, B and C with a total of **ten (10)** questions.
2. Answer **all** questions.
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. All communication devices, calculators and any unauthorized materials are **not** allowed in the examination room.
6. Write your **Examination Number** at the top right hand corner of every page.
7. Where necessary the following constants may be used:
   (i) Acceleration due to gravity, $g = 10m / s^2$.
   (ii) Density of water = $1g / cm^3$ or $1000kg / m^3$.

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

SECTION A (30 MARKS)

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

(i) Why Physics, Chemistry and Biology are natural science subjects?
A They need practical and theory work for learning.
B They need only theory for learning.
C They need practical work only.
D They need only observation.

(ii) Which of the following is a safety precaution in the Physics laboratory?
A Doing experiment in the laboratory
B Handling of apparatus in the laboratory
C Use equipment with care in the laboratory
D Do anything in the laboratory

(iii) Which instrument will you use to measure accurately the inside diameter of a bottle neck?
A tape measure. B micrometer screw gauge.
C metre rule. D Vernier calipers.

(iv) Which of the following statements is correct about mass?
A It is measured by beam balance
B It is measured by spring balance
C It varies with place
D It can be zero.

(v) A hydrometer is an instrument used to measure
A the volume of liquids. B the density of liquids.
C the density of solids. D the volume of solids.

(vi) When a body of mass M, is lifted through a height h, it possesses the energy known as
A kinetic energy. B chemical energy.
C light energy. D potential energy.

(vii) If the angle between two plane mirrors is 60°, what will be the number of images?
A 2 B 3 C 4 D 4

(viii) The presence of charge in a material can be demonstrated by
A electrophorus. B earth wire.
C gold leaf. D electroscope.

(ix) A current of 0.2 A flows through a resistor of 4Ω. The potential difference across a resistor is
A 20 V B 0.8 V C 0.05 V D 8 V

(x) The process of removing magnetism from a material is known as
A polarization. B demagnetization.
C magnetization. D magnetizing.

(xi) How can a real image be distinguished from a virtual image?
A Real image is inverted while virtual image is upright
B Real image is upright while virtual image is inverted
C Virtual image is formed by a convergent rays while real image is formed by divergent rays
D Real image is formed by a convergent rays while virtual image is by divergent rays

(xii) Why an atom is electrically neutral?
A It consists of equal number of electrons
B It consists of equal number of protons and electrons
C It consists of equal number of electrons and neutrons
D It consists of equal number of protons and neutrons

(xiii) A potential difference of 12V is applied across a resistor of resistance 24 Ω. The current in a circuit is
A 0.5 A B 2 A C 0.5 Ω D 288 Ω

(xiv) If a North pole is used in the stroking method of magnetization, the end where the stroking begins is
A South pole. B North pole. C West. D East.

(xv) Figure 1 shows a ruler balanced by placing the loads at its ends. What is the weight of X?

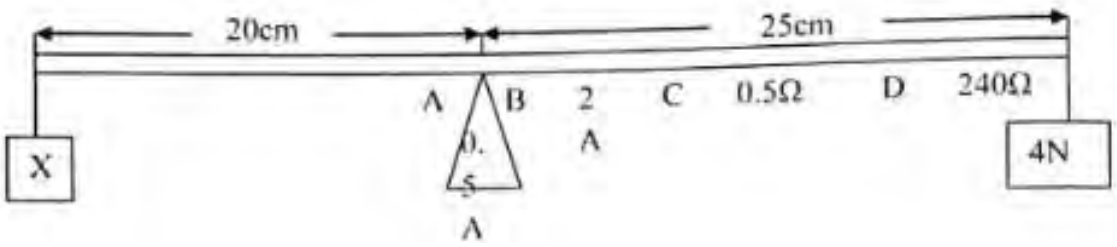

Figure 1

A 5N B 0.5N C 100N D 200N

(xvi) Which of the following is an example of a third class lever?
A Scissors B Fishing pole
C Pliers D Nut cracker

(xvii) Distance between two moving objects will change if
A both are moving with the same velocity.
B both have the same acceleration.
C both have different acceleration.
D both have no acceleration.

(xviii) While of the following best illustrates Newton's third law?
A Inertia B Momentum
C Rocket propulsion D Circular motion

(xix) The temperature of a body of −40°C in Kelvin (K) scale is
A 313 K B 233 K C 272 K D −40 K

(xx) Which of these resources of energy is non-renewable?
A Wave energy B Biofuels
C Radiant energy D Fossil fuel

2. Match the items in **List A** with a correct response in **List B** by writing a letter of a correct response below the corresponding item number in the table provided.

List A	**List B**
(i) An instrument that measures length, depth, internal and external diameters. (ii) An instrument that measures volumes of liquid. (iii) An instrument that measures force of pull (iv) An instrument that transfers a specific amount of liquid from one container to another. (v) An instrument that measures body temperature.	A Measuring cylinder B Pipette C Vernier caliper D Glass tumbler E Spring balance F Clinical thermometer G Magdeburg experiment

Answers

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

3. Complete each of the following statements by writing the correct answer in the space provided.
(i) Basic physical proportions of measurement which cannot be obtained from any other proportions by either multiplication or division are called ……...
(ii) Staircases, winding roads uphill, wedges and a screw are physical examples of ……....
(iii) The resistance of a body to change its state of rest is called …….
(iv) Objects which emit light when they are hot are called ...……..
(v) Materials which obey Hooke's law are known as ……....
……....

SECTION B (50 MARKS)

4. (a) What do you understand by the following terms?

(i) Work ……
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(ii) Energy ……
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(iii) Power ……
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(b) Calculate the power of a pump which can lift 200 kg of water through a vertical height of 6 m in 10 seconds.

(c) A 1000 kg car is travelling down the road at a speed of 15 m/s. How much kinetic energy does it have?

5. (a) (i) Briefly explain the motion of an object under gravity by taking an example of a ball thrown straight up into the air.

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(ii) A car with a velocity of 60 km/h is uniformly retarded and brought to rest after 10 seoncds. Calculate its acceleration.

(b) (i) Distinguish between distance and Displacement …….
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(ii) Provide one example of the law of inertia of a body ……

(c) What mass will be given to a body with an acceleration of 7 m/s^2 by a Force of 3N?

6. (a) State Pascal's principle of pressure ……..
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(b) What are the three factors that affect the liquid pressure?
(i) ……....
(ii) ……
(iii) ……

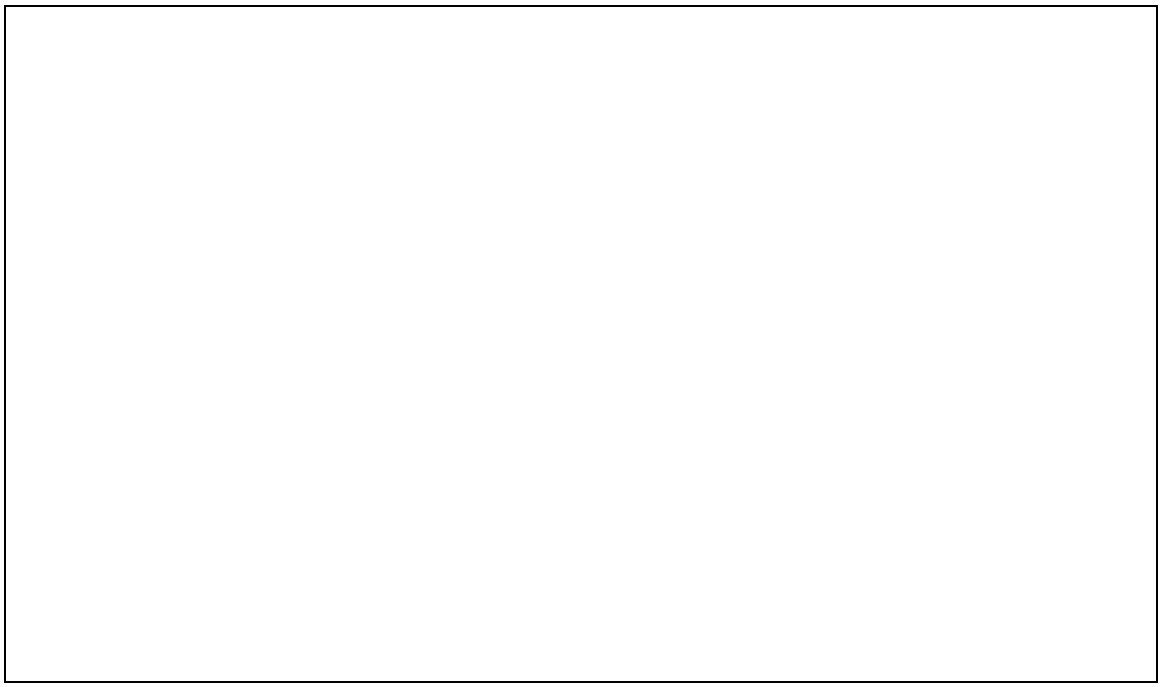
(c) Calculate the area of an object if the pressure exerted is 0.2 N/m^2 and its force is 2 N.

7. (a) Light is a form of energy. State any two characteristics of it which can be distinguished from other forms of energy.

(i) ……....

(ii) ……

(b) With the aid of a diagram, state the laws of reflection.



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(c) How many images can be formed if two mirrors are set?

(i) At an angle of 60°

(ii) Parallel to each other.

8. (a) State the principle of moments.

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(b) Distinguish between stable equilibrium and unstable equilibrium.

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(c) A metre rule is pivoted about a point O as shown in Figure 2 and it is balanced by a load of 0.2 N.

Figure 2

Calculate the mass of the rule.

SECTION C (20 MARKS)

9. (a) What are the uses of the following devices?

(i) Manometer ……...
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(ii) Hare's apparatus (inverted U-tube) ...……
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(iii) U-tube ……..
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(iv) Barometer ……
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(b) Why a big Elephant manages to walk comfortably in muddy soil without sinking while a human being may sink easily?

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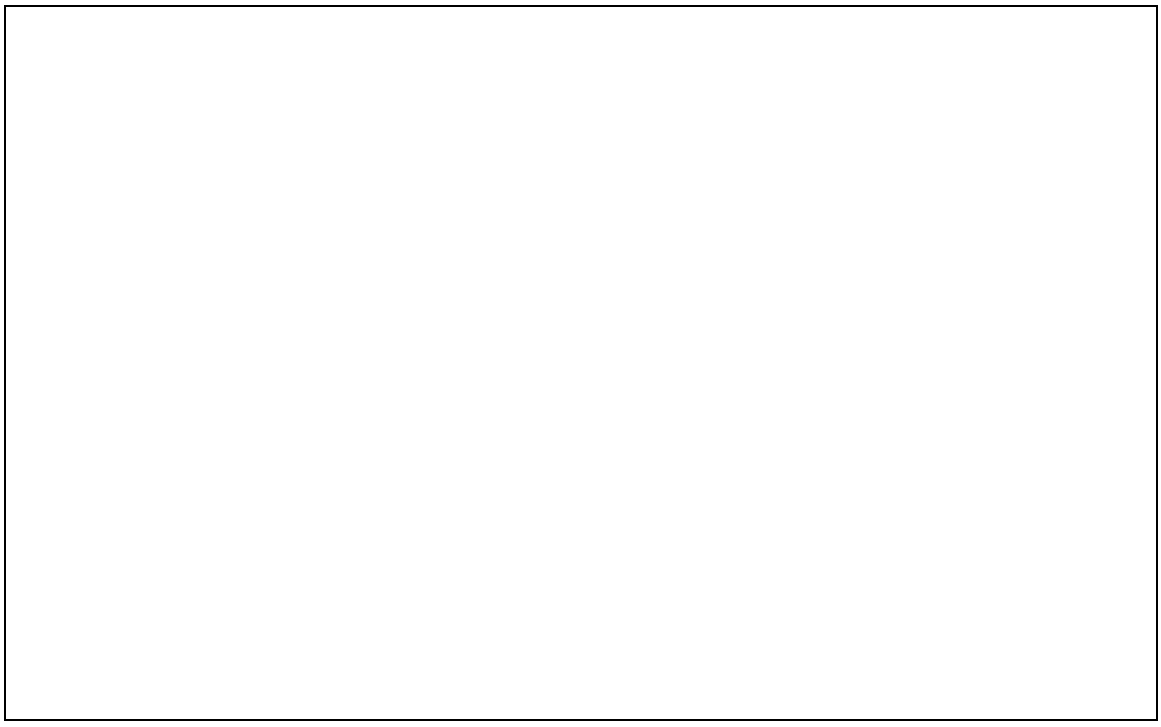
(b) Draw a well labeled diagram which demonstrates that liquid pressure depends on depth.



10. (a) Mention three uses of current electricity

(i) ……....
(ii) ……....
(iii) ……....

(b) Why is it advised to connect bulbs in parallel arrangement during installation of electricity in most buildings?

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(c) Form one students at Saku Secondary School who were conducting an experiment to verify Ohm's Law in the laboratory, were given the following instructions: *Connect in series a resistor R, a battery B of two cells, a switch K, an ammeter A and rheostat S. Then connect a voltmeter V across resistor R*. Draw a well labelled circuit representing this experiment.