

**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 $1000kg / m^3$.

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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?

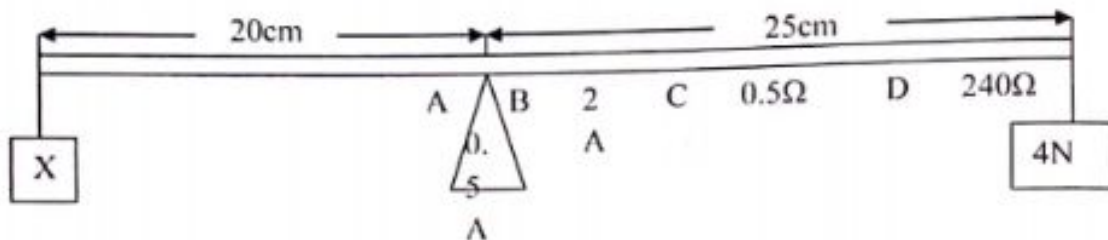


Figure 1

- 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) Which 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.	A Measuring cylinder
(ii) An instrument that measures volumes of liquid.	B Pipette
(iii) An instrument that measures force of pull	C Vernier caliper
(iv) An instrument that transfers a specific amount of liquid from one container to another.	D Glass tumbler
(v) An instrument that measures body temperature.	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
 - (ii) Energy
 - (iii) Power
- (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 seconds. 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)

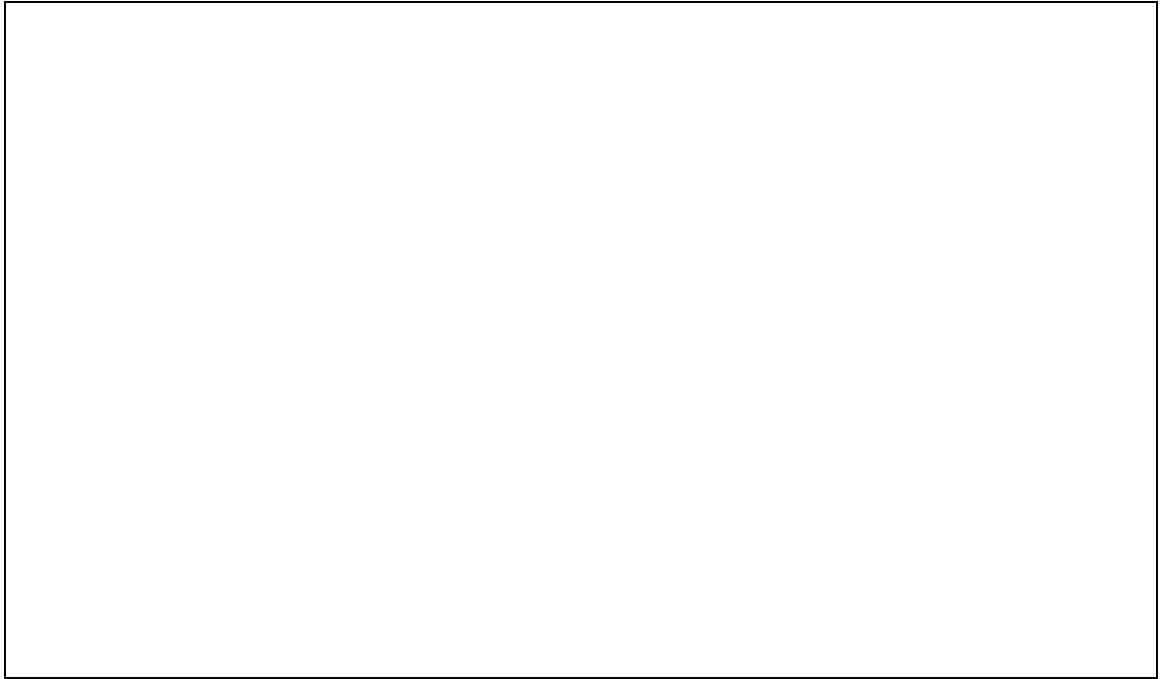
(iii)

(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.

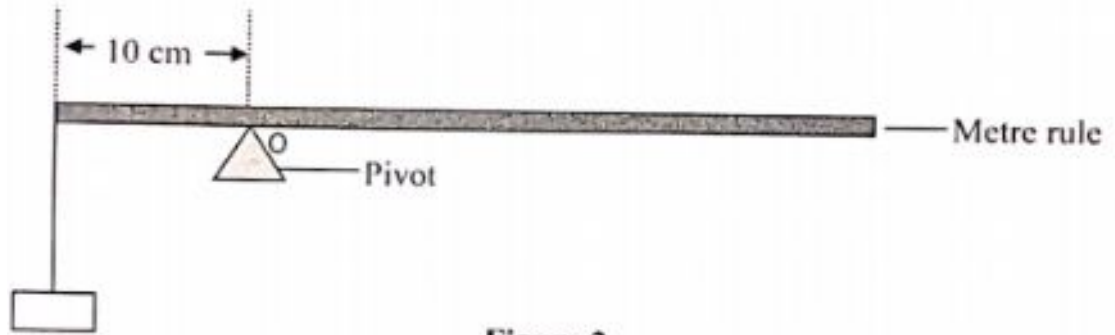
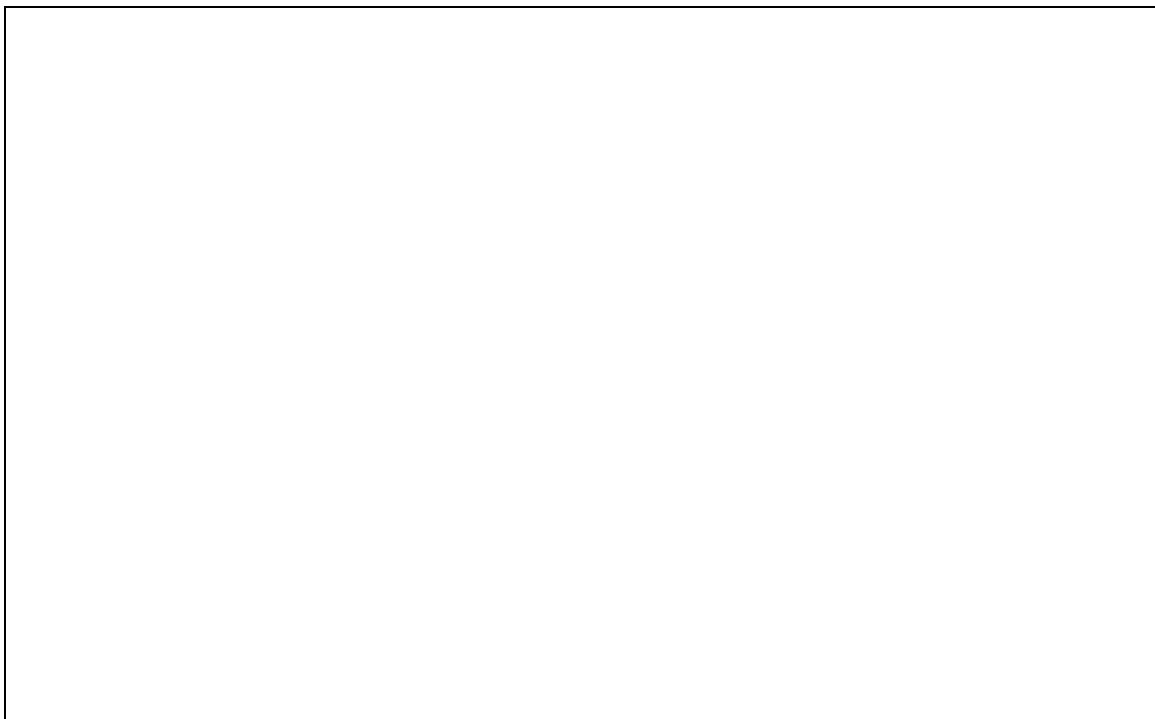


Figure 2

Calculate the mass of the rule.

SECTION C (20 MARKS)

9. (a) What are the uses of the following devices?
- (i) Manometer
 - (ii) Hare's apparatus (inverted U-tube)
 - (iii) U-tube
 - (iv) Barometer
- (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.

