

THE UNITED REPUBLIC OF TANZANIA



PRESIDENT'S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT  
HOME PACKAGE FORM TWO EXAMINATION, APRIL 2020

CODE: 031

PHYSICS

TIME: 2:30 HOURS

INSTRUCTIONS:

- This paper consists of section **A, B** and **C**.
- Answer **ALL** questions in the space provided
- All writings **must be in blue or black** ink ECXCEPT drawings which must be in pencil.
- Cell phones and calculators are **Not Allowed** in the examination room.
- Where necessary the following constants may be used:-
  - Density of water,  $\rho_w = 1 \text{ g / cm}^3$  or **1000kg/cm<sup>3</sup>**
  - Acceleration due to gravity,  $g=10\text{m/s}^2$  or 10N/kg
  - Pie,  $\pi= 3.14$
  - Atmospheric pressure =  $1.03 \times 10^5\text{Pa}$
  - Acceleration due to gravity,  $g=10\text{m/s}^2$  or 10N/kg
  - Pie,  $\pi= 3.14$
  - Atmospheric pressure =  $1.03 \times 10^5\text{Pa}$

For the Use of Examiner's Only

QUESTION NUMBER	SCORE	EXAMINER'S INITIALS
01		
02		
03		
04		
05		
06		
07		
08		
09		
10		
<b>TOTAL</b>		

SECTION A: (20 MARKS)

- For each of the items (i) – (xx) choose the correct answer among the given alternatives and write its letter in the box provided besides each questions
  - Physics can be explained as:-
    - The study of science
    - The relation of matter
    - The study of matter in relation to energy
    - None of the above is correct
  - If the angle between two plane mirrors is  $60^\circ$ , the number of images will be:-
    - 2
    - 3
    - 4
    - 5
  - The term displacement means
    - A distance covered in a given direction
    - A distance covered without direction
    - A rate of distance
    - A rate of displacement
  - Why is water unsuitable for a thermometer liquid?
    - It does not wet glass
    - It wets glass
    - It is opaque
    - It is a good conductor of heat
  - Unlike magnetic poles as well as unlike electric charges when they brought closely to each other they tend to:-
    - Attract each other
    - Repel each other
    - Exit in pair
    - Separate

vi) Which of the following is a fundamental quantity in measurement

- a) Pressure
- b) Speed
- c) Weight
- d) Mass

vii) A person weighing 100N has a mass of:

- a) 0.1kg
- b) 15kgs
- c) 100kgs
- d) 10kgs

viii) Pressure in a liquid depends on:-

- a) Depth
- b) Mass
- c) Weight
- d) Density

ix) Which of the following is the most closely related to inertia?

- a) Acceleration
- b) Weight
- c) Mass
- d) Force

x) Ability of a pond skater to walk on water is one of the application of:-

- a) Osmosis
- b) Elasticity
- c) Capillarity
- d) Surface tension

xi) The energy which is obtained from the hot rocks underground is called .....

- a) Geothermal energy
- b) Solar energy
- c) Water energy
- d) Wind energy

xii) When walking a man exhibits

- a) Unstable equilibrium
- b) Stable equilibrium
- c) Neutral equilibrium
- d) Both A and B

xiii) The following instruments are used for measuring length. Which one is not?

- a) A ruler
- b) A micrometer screw gauge
- c) A eureka can
- d) A Vernier caliper

xiv) Magnets are often fitted on the doors of freezer and some cupboards so as to:-

- a) Keep iron away
- b) Keep away heat
- c) Keep the door tightly closed
- d) Keep the inside environment warm

xv) A pair of scissors is an example of \_\_\_\_\_ class lever

- a) A first
- b) A second
- c) A neutral
- d) A third

xvi) The acceleration due to gravity can be determined by observing the motion of:-

- a) A simple pendulum
- b) inclined plane
- c) free fall motion
- d) stationary velocity

xvii) A temperature of 100°F is equivalent to:-

- a) 37.8°C
- b) 73.3°C
- c) 47.8°C
- d) 33.3°C

- xviii) Which of the following forms of energy is not renewable
- Fossil fuel
  - Bio fuels
  - Wave energy
  - Radiant energy
- xix) In a three pulley system, the velocity ratio is:-
- $\frac{1}{3}$
  - 3
  - 30
  - 0.3
- 
- xx) An up thrust experienced by a body weighing 5.0N in air and 3.2N when is completely immersed in a liquid is:-
- 0.4N
  - 0.6N
  - 1.6N
  - 1.8N
- 

**SECTION B: (40 MARKS)**

2. Match each item in LIST A with a correct response in LIST B by writing its letter below the number of the corresponding item in LIST A in the table provided.

LIST A	LIST B
i) An object with high centre of mass	A. Centre of gravity
ii) A state of balance of a body	B. Unstable equilibrium
iii) A point where the force of gravity can be considered to act	C. Regular body
iv) Turning effect of force	D. Principle of moments
v) Sum of clockwise moments equal to sum of anticlockwise moments	E. Rotational motion
vi) Forces in one direction must equal forces in the opposite direction	F. Moment
vii) Centre of gravity is at its geometrical centre.	G. Equilibrium
viii) Cone resting on its curve surface	H. Stable equilibrium
	I. Condition for equilibrium
	J. Neutral equilibrium
	K. Translational motion

**ANSWERS**

LIST A	i	ii	iii	iv	v	vi	vii	viii
LIST B								

3. Complete each of the following statements by writing the correct answer in the space provided
- The relative density of a substance can be easily determined by .....
  - The lever, pulley, inclined plane bottle, opener and see-saw are examples .....
  - The resistance of a body to change its state of rest is called .....
  - A loaded car of mass 25,000kg is moving at 20m/s, its linear momentum is .....
  - Laterally inverted is one of the property of the image formed by .....
  - For resistors connected in ..... the current is the same throughout t the circuit to all resistors.
  - The materials which do not allow the charges to flow through it are called .....
  - The law of magnetism states that “unlike poles ..... while like poles .....
4. a) What do you understand by the following terms
- Work
  - Energy
  - Power
- b) Calculate the power of a pump which can lift 200kg of water though a vertical height of 600cm in 10 seconds.
5. a) Differentiate between the following terms
- Magnetic material and non-magnetic material
  - Speed and velocity
- b) State Archimedes principle

c) How long does a car accelerate from rest to 30m/s if its acceleration is  $4.5\text{m/s}^2$ ?

6. a) Three states of matter are

- i) .....
- ii) .....
- iii) .....

b) The two types of intermolecular forces are

- i) .....
- ii) .....

c) List down three (3) methods used to charge a body as used in electrostatic

- i) .....
- ii) .....
- iii) .....

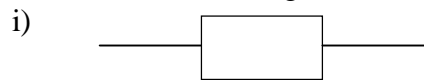
**SECTION C: (40 MARKS)**

6. a) Define relative of a substance

b) The mass of an empty density bottle is 15g. When it is filled with a fluid of density  $1.2\text{g/cm}^3$ , its mass is 5kg. Find the volume of the bottle.

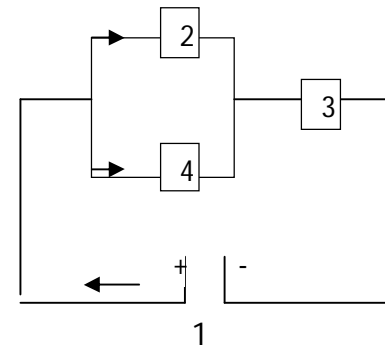
c) Find the relative density of a substance of density  $0.75\text{g/cm}^3$

8. a) Name the following electrical symbols as used in physics



b) State Ohm's law

c) Consider the figure below



From the figure above, calculate

- i) Total resistance and
- ii) Total current flowing

9. a) State the three equations of motion

- i) .....
- ii) .....
- iii) .....

b) A car starts from rest and move with a constant acceleration of  $3\text{m/s}^2$  until it reaches a velocity of 24m/s. It maintains this velocity for 10 seconds then breaks to rest with a retardation of  $4\text{m/s}^2$ .

- i) Sketch a velocity-time graph for the motion.
- ii) From the graph, find the total distance travelled

10. a) What is meant by the following terms

- i) Mechanical advantage
- ii) Velocity ratio
- iii) A lever
- iv) Efficient of a machine

b) A Wheel and Axle with an efficient of 90% is used to raise a load of 20000N. The radius of the wheel is 40cm while that of the axle is 5cm. calculate:-

- i) The velocity ratio of the wheel and axle
- ii) The mechanical advantage of the wheel and axle
- iii) The effort required to raise the 20000N load