

Candidate's Examination No .....

**PRESIDENT'S OFFICE  
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT  
LUDEWA DISTRICT COUNCIL  
FORM TWO DISTRICT MOCK EXAMINATION 2022**

**031****PHYSICS****TIME: 02:30HOURS****Friday Morning, June 10<sup>th</sup>, 2022 a.m.****INSTRUCTIONS.**

1. This paper consists of sections **A**, **B** and **C** with a total of **10** questions.
2. Answer **ALL** questions from both sections.
3. All communication devices, calculators and any unauthorized materials are not allowed in the examination room.
4. All writing must be in blue or black ink EXCEPT drawings which must be in pencil.
5. Remember to write your candidate number on both pages at right hand corner of every page.
6. The following constants may be used.
  - Density of water,  $\rho_w = 1\text{g/cm}^3$  or  $1000\text{kg/m}^3$ .
  - Gravitational field strength,  $g = 10\text{N/kg}$

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

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**SECTION A (15 marks)**

**Answer all question from this section.**

1. For each of the items (i) – (x), choose the correct answer from among the given alternatives and write its letter beside the item number in the answer booklet provided.
  - (i) Physics subject is very wide to understand it as a whole. Due to that situation, scientists have decided to break it down into several concepts for simplicity of understanding and mastering. As a student who is interested in physics, what is a correct set of concepts for the reasons above?
    - A. Agrobusiness, mechanics and molecules
    - B. Heat, optics, mechanics and electricity.
    - C. Biophysics, chemophysics, geophysics and astrophysics
    - D. Wave, physics of the atom and radionuclide.
  - (ii) In one of the following areas, quantitative measurement knowledge plays an important role except.
 

A. In hospital	C. In schools
B. In agriculture	D. In smell testing
  - (iii) A physics teacher asked the students to explain briefly things which may cause fire in the physics laboratory. The students tried to answer but some explanations were not correct. Identify the explanations which were not correct.
    - A. Electrical faults
    - B. Presence of flammable materials
    - C. Carelessness in using gas lighter and match boxes
    - D. The colour of some chemicals supports combustion
  - (iv) A cooking oil was mixed with water and poured into a measuring cylinder and allowed to settle for three minutes, which one will be the observed phenomenon?
    - A. Cooking oil floats over water
    - B. Meniscus of water appeared convex in shape at the surface
    - C. Water floating on the oil.
    - D. Water and oil completely mixed up.
  - (v) If two cars are both travelling at 50Km/h and they collide head on, the effect is similar to a car colliding with a wall at what velocity?
 

A. 0 km/h	C. 50 km/h
B. 10 km/h	D. 100 km/h
  - (vi) Thermometer is a device that determine the measure of the kinetic energy that particles of an object possess. Part of a thermometer which prevents mercury from flowing back when temperature falls:
 

A. Stem	C. Bulb
B. Constriction	D. Neck
  - (vii) When a large body of experimental evidences support or does not support the hypothesis, what may the hypothesis eventually be considered?
 

A. Observation	C. Conclusion
B. Insight	D. Law
  - (viii) A house building contractor fitted window glass panes which someone cannot see through, but the rooms are fully illuminated with light. These types of glass pane materials are said to be:
 

A. Dim	B. Opaque	C. Translucent	D. Transparent
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  - (ix) The following is a reason why objects in air tend to fall at the same time when they are released from the same height h above the ground level; -

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- A. They have the same weight  
 B. There is usually no resistance in the air  
 C. Acceleration due gravity is the same  
 D. None of the above
- (x) The substance which is lighter has low density and less affected by gravitational force. In comparison with water, the number of times a substance is denser than water is termed as?
- A. Density  
 B. Relative density  
 C. Volume  
 D. Mass
2. Match the items from LIST A with the corresponding responses in LIST B by writing its letter in the box provided.

LIST A	LIST B
(i) Atmospheric pressure	A. Minimum force
(ii) Pressure	B. Hydraulic press
(iii) Pascal principle	C. $\text{N/m}^2$
(iv) Application of atmospheric pressure	D. Pascal
(v) Razor blades and knife blades	E. Maximum force
	F. Manometer
	G. High pressure
	H. Low pressure
	I. Aneroid barometer
	J. Bicycle pump

Answers

LIST A	i.	ii.	iii.	iv.	v.
LIST B					

### SECTION B (60 Marks)

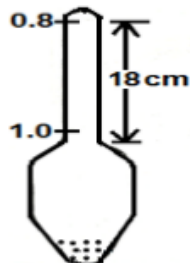
**Answer ALL questions from this section.**

3. (a) When water and mercury were in two separate measuring cylinders, the teacher asked student to observe the reading in both cylinders. Why does mercury form downward meniscus while that of water forms upward meniscus?
- .....
- .....
- .....
- .....
- (b) A force of 4 N causes a certain copper wire to extend to 1.0 mm. Find the load that will cause a 3.2 mm extension on the same wire.
4. (a) A student from school a certain school immersed the test tube into a liquid and found it is floating vertically upright. Why a test tube does so?

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(b)

The diagram below shows on form of man hydrometer used to measure the densities of liquid over the range of  $0.8$  to  $1.0 \text{ g/cm}^3$ . If the area of cross section of the stem is  $0.5 \text{ cm}^2$  and the distance between the  $0.80$  and  $1.00$  division is  $18 \text{ cm}$ .



What is the volume of hydrometer below  $1.0$  graduated mark?

5. (a) (i) Most of us confuses and sometimes misuse the term Energy and power that they mean the same. As a competent student give the difference.

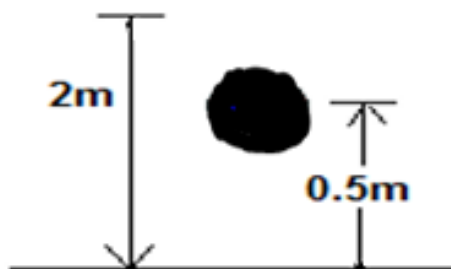
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- (ii) The ball rebounds to the height less than the original height. Explain briefly why does this happen.

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(b)

A teacher was demonstrating the motion of the stone of mass  $2 \text{ kg}$  as it moves vertically upward but he then released it from height of  $2 \text{ m}$  above the ground.



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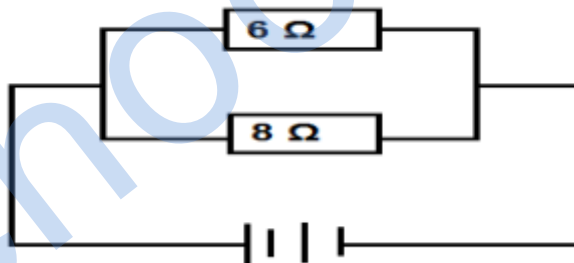
(i) How much of the potential energy at height of 0.5m does the stone possess?

(ii) Determine its kinetic energy at height of 0.5m.

6. (a) In verifying ohms law, the experiment was conducted in a place with variation of physical factors. Describe four (04) factors that affects the flow of current in the circuit?

- (i) .....  
 (ii) .....  
 (iii).....  
 (iv).....

(b) The circuit diagram below that shows the current through the  $6\ \Omega$  resistor is 2.5 A.



(i) What is the magnitude of the voltage from the power supply?

(ii) Determine the current through the  $8\ \Omega$  resistor.

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7. (a) (i) When the pulling force is applied to the handle of the door, the hinge acts as the axis of rotation, and the door turns about. What do you understand by the term turning effect?
- .....
- .....
- .....
- (ii) When forces are in equilibrium, it means that there is no net force to cause any movement. Describe conditions for parallel forces to be in equilibrium.
- .....
- .....
- .....
- (b) A heavy uniform metal beam AB weighting 500kg is supported at its ends. The beam carries a weight of 3000kg at a distance of 1.5m from end A. If the beam is 4m long, determine the thrusts on the supports A and B.

8. (a) (i) During the class session, the teacher introduced the lesson that is 'Simple Machine'. What do you understand that term?
- .....
- .....
- .....
- (ii) Draw a diagram of a single – string pulley system with a velocity ratio of 4

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- (b) The electric motor of a crane uses 42 000 J of electric energy lifting a pack of eight bags of cement of 25 kg each through a distance of 15 m from the ground to the fourth floor. Calculate the efficiency of the motor during the lifting process

9. (a) When the metal can that containing hot water is closed, and the cold water is poured on it, the can collapses. Why?

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- (b) In an experiment using Hare's apparatus, the lengths of methanol and water columns were found to be 16 cm and 12.8 cm respectively
- (i) What is the relative density of methanol?

- (ii) If the length of methanol column was altered to 21.5 cm what would be the new height of the water column?

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**SECTION C (15 MARKS)**

10. (a) A form two student is in the physics laboratory. He is provided with density bottle, sand, digital balance and water. He is required to determine the density of sand using the instruments provided above, show how will he determine the density of the sand?
- (b) In an experiment to determine the density of sand, Sophia obtained and recorded the following results.  
Mass of the density bottle,  $M_1 = 200\text{g}$   
Mass of density bottle and sand,  $M_2 = 490\text{g}$   
Mass of density bottle, sand and water,  $M_3 = 550\text{g}$   
Mass of density bottle and water,  $M_4 = 300\text{g}$
- (i) What was the density of sand?
- (ii) Determine the relative density of sand.