Candidate's Examination Number _____

THE REVOLUTIONARY GOVERNMENT OF ZANZIBAR

ZANZIBAR EXAMINATIONS COUNCIL

FORM THREE ENTRANCE EXAMINATION

215 PHYSICS

TIME: 2:30 HOURS THURSDAY 07TH DECEMBER, 2023 A.M

INSTRUCTIONS TO THE CANDIDATE

1. **This paper consists of THREE (3) sections A, B and C.**
2. **Answer ALL questions in section A and B, and any TWO (2) in section C. Question 9 is compulsory.**
3. **Write your examination number on each page.**
4. **Write your answers in the space provided.**
5. **Use a blue or black pen in writing. The diagrams must be in a pencil.**
6. **Cellular phones and unauthorized materials are not allowed in the examination room.**
7. **Where necessary the following constants may be used.**
   Density of water = 1000kg/m^3, Pie, π = 3. 14, g = 10m/s^2

FOR EXAMINER'S USE ONLY		
QUESTION NUMBER	**MARKS**	**SIGNATURE**
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9a.		
9b.		
10.		
11.		
TOTAL		
CHECKER'S SIGNATURE		

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This paper consists of 16 printed pages

Candidate's Examination Number _____

SECTION A: (30 Marks)

Answer ALL questions in this section.

1. Choose the correct answer and write its letter in the table below.

   i. Pull or push of a body is called
   A. Displacement B. Energy C. Force D. Velocity

   ii. The diameter of a thin object can be measured by using
   A. Beam balance B. Metre rule
   C. Measuring cylinder D. Micrometer screw gauge

   iii. Newton's 3rd law of motion state that
   A. Action is greater than reaction
   B. Action and reaction are equal and opposite
   C. Action and reaction are equal and parallel
   D. Reaction is less than action

   iv. The following are forms of energy **except**
   A. Heat B. Light C. Sound D. Weight

   v. The main reason for a dam's wall to be thicker at the bottom than at the top is to
   A. Accommodate more water B. Accommodate less water
   C. Counterbalance the pressure D. Reduce energy generation

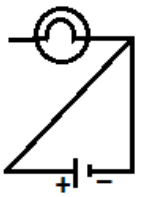
   vi. The burning material used in a Class A fire is
   A. Kerosene and wood B. Magnesium and sodium
   C. Petrol and kerosene D. Wood and paper

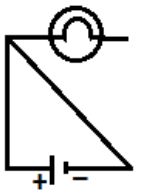
   vii. Which phenomena taking place when kerosene rises up a wick?
   A. Capillarity B. Cohesion
   C. Osmosis D. Surface tension

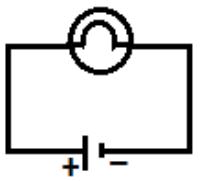
   viii. It is easier to loosen a nut on a bolt by a spanner with
   A. Longer stem B. Shorter stem
   C. Heavier stem D. Weaker stem

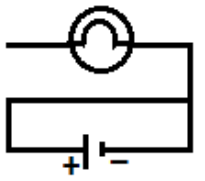
   ix. Attraction force between two magnet occurs when
   A. Neutral points meet together
   B. North pole meets with South Pole
   C. North pole meets with North Pole
   D. South pole meets with South Pole

x. Which of the following is closed circuit?

A. 

B. 

C. 

D. 

Answers

i	ii	iii	iv	v	vi	vii	viii	ix	x

2. Match the statements from **LIST A** with their corresponding terms from **LIST B** as they are used in Archimedes principle and law of floatation.

LIST A	**LIST B**
i. A substance that has no fixed shape and yields easily to external pressure	A. Relative density
ii. Measure weight of a body	B. Upthrust
iii. Ratio of density of object to the density of water	C. Hygrometer
iv. Shows maximum height of the ship that should be under water	D. Apparent weight
v. Tendency of an object to fall or drop to lower levels in a fluid	E. Submarine
vi. Tendency of an object to be suspended on the fluid surface	F. Real weight
vii. The force that enables the object to float	G. Spring balance
viii. Used for measuring the relative density	H. Sinking
ix. Weight of a solid when in fluid	I. Fluid
x. Weight of a body in air	J. Floatation
	K. Plimsol line
	L. Hydrometer

Answer

i	ii	iii	iv	v	vi	vii	viii	ix	x

3. Fill the correct answer in the blank spaces provided.

   i. The force acting normally per unit area is called _____.

   ii. The angle between true north and compass needle direction is _____.

   iii. The rate at which a distance covered in a specific direction is known as _____.

   iv. The objects that emit their own light are referred as _____.

   v. The instrument which is used to measure very small amount of current is called _____.

   vi. When ebonite rod rubbed with _____ it acquires negative charges.

   vii. $0^{o}C$ is equivalent to _____ Kelvin.

   viii. A device used to convert solar energy into electrical energy is known as _____.

   ix. A box containing items that are used to give help to a sick or injured person is called _____.

   x. Mathematically _____ is the formula used to calculate velocity ratio of the screw jack.

SECTION B: (50 Marks)

Answer ALL questions in this section.

4. a. Define the following terms as used on measurement.

   i. Error

   _____

   _____

   _____

   ii. Mistake

   _____

   _____

   _____

b. i. Errors usually arise due to several reasons. Mention three (3) of them.

_____

_____

_____

ii. Distinguish between zero error and instrumental error

_____

_____

_____

_____

_____

c. Juma measured the length and width of his book and he found that the length was 26cm and the width was 20cm. What was the perimeter of Juma's book in metre.

_____

_____

_____

_____

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_____

_____

5. a. Explain briefly the following terms as used in light.

i. Shadow

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_____

_____

_____

ii. Regular reflection

_____

_____

_____

_____

b. Light is the form of energy which its characteristics differ from other forms of energy. List down three (3) characteristics of light.

_____

_____

_____

_____

c. Calculate the number of images if two plane mirror placed at

i. Perpendicular angle

_____

_____

_____

_____

ii. Angle 360^{o}

_____

_____

_____

_____

6. a. Define the following terms as used in force.

i. Newton

_____

_____

_____

_____

ii. Fundamental forces

_____

_____

_____

_____

b. Mention one property of the following fundamental force.

i. Electromagnetic force

_____

_____

ii. Strong nuclear force

_____

_____

iii. Gravitational force

_____

_____

iv. Weak nuclear force

_____

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_____

_____

c. If an object has a mass of 6000g, how much would it weigh on the earth?

_____

_____

_____

_____

_____

_____

7. a. i. State the fundamental law of static electricity.

_____

_____

ii. List down three (3) methods of charging a body.

_____

_____

_____

_____

b. i. Define the gold - leaf electroscope.

_____

_____

_____

ii. Draw a well labeled diagram of the gold - leaf electroscope.

8. a. i. Define impulsive forces

_____

_____

_____

ii. Mention three (3) types of inertia.

_____

_____

_____

_____

b. A bullet of mass 5g leaves a gun of mass 250g with a velocity of 50m/s. Calculate the following

i. Momentum change of the bullet.

_____

_____

_____

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_____

ii. The velocity of recoil of the gun.

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iii. Momentum change of gun.

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SECTION C: (20 Marks)

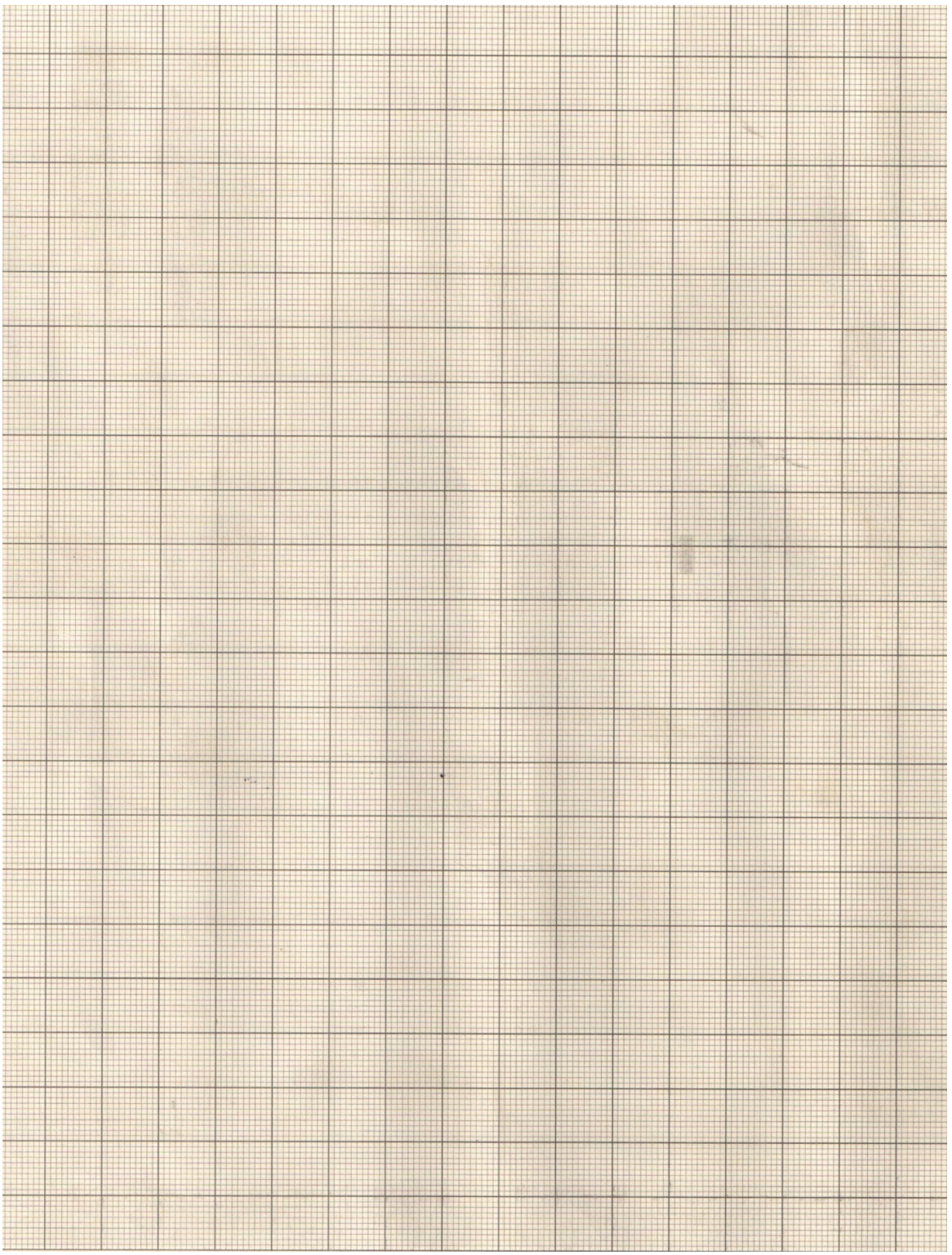
Answer TWO (2) questions in this section.

Question 9 is COMPULSORY, answer either 9 (a) or 9 (b).

9. a. The students of a certain secondary school performed an experiment to determine the motion of a moving object and the following data were collected.

Velocity (m/s)	0	12	24	36	48	60	72	84
Time (sec)	0	2	4	6	8	10	12	14

i. Plot the graph of velocity against time (On the graph paper)



ii. From the graph, calculate the slope (s).

iii. What is the nature of the graph?

iv. What is the physical meaning of the slope (s)?

9. b. Complete the table below by writing the missed names, diagrams and uses of items found in first aid kit.

Name	Diagram	Use
i. Thermometer		
ii.		
iii.		Cutting dressing materials
iv. Disposable sterile gloves		
v.		Covering minor wound

10. a. i. Explain briefly why a tractor with wide tire cannot easily get stuck in the muddy place as compared to vehicle with narrow tire?

_____

_____

_____

_____

_____

ii. Write two (2) units of pressure.

_____

_____

b. i. Mention two (2) properties of pressure in liquids.

_____

_____

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_____

ii. The areas of the piston of a hydraulic press are 4×10^{-4} m^2 and 3×10^{-2} m^2 respectively. If the smaller piston is pushed down with a force of 200N. Calculate the force required to push the larger piston.

_____

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11. a. Define the following terms as applied in simple machine.

i. Inclined plane

_____

_____

_____

_____

_____

ii. Pitch

_____

_____

_____

_____

b. Name two (2) devices that can operate through application of wheel and axle.

_____

_____

_____

c. A force of 500N is used to raise a load of 4000N through an inclined plane. Given that the slant height and the vertical height of the plane are 21m and 7m respectively. Calculate

i. The velocity ratio of the plane.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

ii. Mechanical advantage of the plane.

iii. Efficiency of the plane.

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ROUGH WORK