Candidate's Examination Number .....

SMZ

ZANZIBAR EXAMINATIONS COUNCIL

FORM THREE ENTRANCE EXAMINATION

042 PHYSICS

TIME: 2:30 HOURS FRIDAY 5TH NOVEMBER, 2021 A.M

INSTRUCTIONS TO CANDIDATES

1. This paper consists of THREE (3) sections A, B and C.
2. Attempt ALL questions in section A and B, and any TWO (2) in section C. Question NINE (9) is COMPULSORY.
3. Write your examination number on each page.
4. Write your answers in the space provided.
5. Use 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 (1g/cm^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.		
9 a.		
9 b.		
10.		
11.		
TOTAL		

This paper consists of 16 printed pages

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SECTION A: (30 Marks)
Answer ALL questions in this section.

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

i. Matter is anything which has
   A. Direction and occupies space
   B. Mass and occupies space
   C. Magnitude and occupies space
   D. Weight and occupies unit

ii. The rate of doing work is
   A. Energy B. Force C. Power D. Impulse

iii. In order to have low resistance, the wire should be
   A. Longer and thicker
   B. Longer and thinner
   C. Shorter and thicker
   D. Shorter and thinner.

iv. Which of the following is a derived unit?
   A. Kilogram B. Ampere C. Kelvin D. Newton

v. $\text{Force} = \text{mass x acceleration}$. This obeys
   A. Newton's second law of motion
   B. Law of inertia
   C. Newton's third law of motion
   D. Momentum change

vi. A solid box weighing 120N has surface area of $0.5m^2$. The pressure which can be exerted on the box is
   A. $60\ N/m^2$ B. $24\ N/m^2$ C. $600\ N/m^2$ D. $240\ N/m^2$

vii. A Vernier caliper is used to measure
   A. Mass of a thin wire
   B. Volume of a thin wire
   C. Diameter of a thin wire
   D. Length of a thin wire

viii. In order to decrease the pressure in a bicycle tire, one normally
   A. Decrease the temperature of the tire
   B. Increase the friction of the tire
   C. Increase the density of the air in the tire
   D. Decrease the number of air molecules in the tire

ix. Translucent is a medium which
   A. Allow some of the light to pass through it.
   B. Allow all the light to pass through it.
   C. Produces light by itself.
   D. Do not allow all light to pass through it.

x. A force of 50N is used to lift a load of 100N. What is the mechanical advantage?

A. 50 B. 5000 C. 2 D. 0.5

ANSWERS

i	ii	iii	iv	v	vi	vii	viii	ix	x

2. Match the item in LIST A with a correct response in LIST B by writing its letters in the table below.

LIST A	LIST B
i. Apparent loss in weight	A. A rigid body when in use turns about a fixed point
ii. Earth magnetic field	B. Weight of an object measured in air
iii. Spring balance	C. Heavy winds
iv. 10 N/kg	D. Weight of an object measured in liquids
v. Apparent weight	E. Upthrust
vi. North and south poles	F. It gives useful information in the search for minerals
vii. Least count	G. Acceleration due to gravity
viii. The resistance of the fluid to flow	H. Occurs when the observer takes measurements from the wrong position
ix. Parallax error	I. It is used to measure length of an object
x. Lever	J. Viscous force
	K. The difference between the main scale division and vernier scale division
	L. It is used to measure weight
	M. Occurs when the observer takes measurements from the right position
	N. Attracts each other

ANSWERS

i	ii	iii	iv	v	vi	vii	viii	ix	x

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

   i. Simple pendulum moves_____ and _____.

   ii. In liquid _____ act equally to all directions.

   iii. The deviation from the true reading is called as _____.

   iv. The rate of change of velocity is called _____.

   v. In the _____ lever, the fulcrum is located between the effort and the load.

   vi. Mercury has an _____ meniscus.

   vii. Bandages and cotton wool are used to clean and cover _____.

   viii. Liquid and _____ are made up of particles that are in random motion.

   ix. The_____ force causes the machine parts to tear and wear.

   x. The S.I unit of turning effect of a force is _____.

SECTION B: (50 Marks)

Answer ALL questions in this section.

4. a. i. State Archimedes' principle

_____

_____

_____

_____

_____

ii. Why does a stone sink in water?

_____

_____

_____

_____

_____

_____

b. The mass of an empty density bottle was 50g. When filled with the volume of $20cm^3$ of petrol its mass become 75g. Calculate the:

i. Density of petrol

_____

_____

_____

_____

_____

_____

ii. Relative density of petrol

_____

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5. a. i. Differentiate between luminous and non-luminous objects.

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ii. State the laws of reflection of light.

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iii. Write two (2) characteristics of an image formed in a plane mirror.

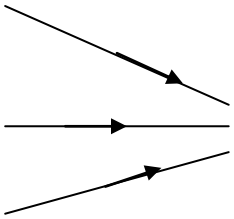
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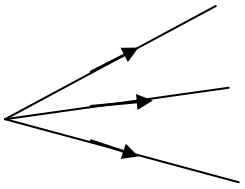
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b. Identify the name of beam shown in the figures below



i. _____



ii. _____

6. a. Define the following terms

i. Joule

_____

_____

_____

_____

ii. Watt

_____

_____

_____

b. List two (2) requirements for work to be done.

_____

_____

_____

c. A body of mass 8kg is pulled by a force of 40N along a smooth floor through a distance of 80m for 4 seconds. Find

i. The work done by a force

_____

_____

_____

_____

_____

ii. Power

_____

_____

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7. a. State Newton's first law of motion.

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b. With examples, distinguish between elastic and inelastic collision.

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c. A trolley A of mass 3kg is travelling at 12m/s. It collides with a stationary trolley B of mass 4kg. After the collision, the two continue travelling together at 6m/s.

i. Calculate the momentum of trolley A before the collision.

_____

_____

_____

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_____

_____

ii. Calculate the momentum of trolley A after the collision.

_____

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iii. Why is there a change in the momentum of trolley A?

_____

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8. a. i. What is the meaning of First Aid kit?

_____

_____

_____

_____

ii. Complete the table below by writing uses of items found in First Aid kit.

No.	Item	Uses
i.	Antiseptic soap	
ii.	Liniment	
iii.	Scissors and razor blade	
iv.	Petroleum jelly	

b. By using a chart, name all steps involved in a scientific investigation.

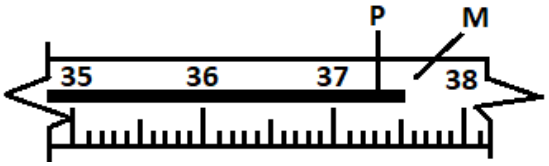
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SECTION C: (20 Marks)

Answer ANY TWO (2) questions in this section.

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

9. a. A student is suffering from Malaria and went to the hospital. The doctor used an instrument as shown in the figure below to measure the condition of her body by placing under her tongue and the measurement in ^{o}C was taken.



i. What is the physical quantity that the instrument measure?

_____

ii. What is the name of this device?

_____

iii. Name the part labeled by letter M _____.

iv. Name the part labeled by letter P _____.

v. What is the reading in ^{o}C that shows the condition of Student?

_____

9. b. In an experiment to verify Ohm's law the following results were obtained.

Potential difference, (V)	Current, (I)
1.0	0.50
1.5	0.75
2.0	1.00
2.5	1.20
3.0	1.50
3.5	2.00

i. Plot the graph of the potential difference (V) against current (I) (on the graph paper).

ii. From the graph determine the slope, s.

_____

_____

_____

_____

_____

_____

_____

_____

_____

iii. What is the physical significance of the slope, s?

_____

_____

iv. Write the S.I unit of the slope in 9 (b) ii above.

_____

10. a. i. List two (2) ways in which resistors can be connected.

_____

_____

ii. With two (2) examples, give the meaning of conductor and insulator.

_____

_____

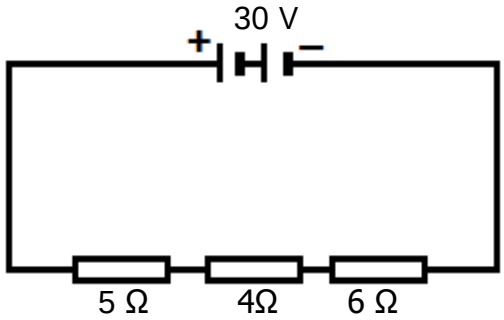
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b. Consider the figure below.



Calculate: -

i. The current flowing through the circuit

ii. Potential difference (p.d) across 5 Ω, 4 Ω and 6 Ω resistors.

11. a. Define inertia.

_____

_____

_____

_____

b. i. Why a passenger siting in a moving bus tend to fall forward when the bus suddenly stops?

_____

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ii. List two (2) conditions for a body to be stable.

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c. A train of mass 22,400kg moving at the rate of 112km/hr is brought to rest in 24 seconds by the action of the brakes. Calculate the braking force applied.

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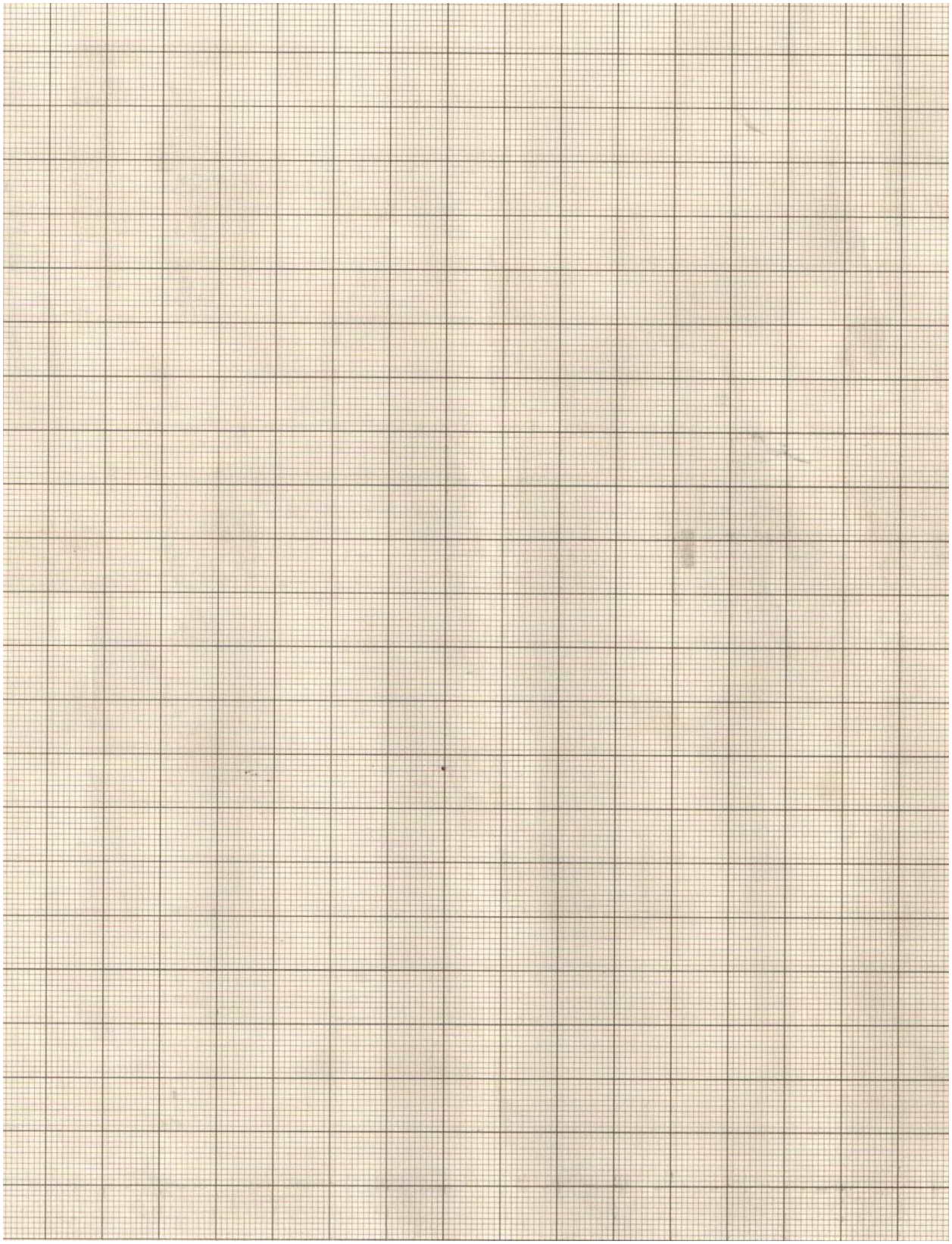
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ROUGH WORK