Candidate's Examination Number _____

SMZ
ZANZIBAR EXAMINATIONS COUNCIL
FORM THREE ENTRANCE EXAMINATION

042 PHYSICS

TIME: 2:30 HOURS SATURDAY 7th DECEMBER, 2019 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 9 is compulsory.
3. Write your answers in the spaces provided.
4. Write your examination number on each page.
5. Use blue or black pen in writing. The diagrams must be in a pencil.
6. Cellular phones are not allowed in the examination room.
7. Where necessary the following constants may be used.
   i. Density of water = 1000kg/m^3 (ii) **Pie, π = 3. 14** (iii) 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 15 printed pages

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

1. Write the letter of the most correct answer in the box below.

   i) The turning effect of a force about a point is called
   A. Gravitational force B. Centre of gravity
   C. Moment of the force D. Principle of moment

   ii) Laboratory rules are useful in
   A. Making students enjoy science subject in the laboratory
   B. Making students conduct experiment freely in the laboratory
   C. Ensuring good communication in the laboratory
   D. Ensuring safety in the laboratory

   iii) Physics, Chemistry and Biology are natural science subjects which need
   A. Practical and theory work for learning B. Only theory for learning
   C. Practical work only D. Only observation

   iv) If one cell in a two cell torch is placed in the opposite direction
   A. The torch will give normal light B. The torch will not give light
   C. The torch will give bright light D. The torch will give dim light

   v) Work and energy have the same SI Unit
   A. Calorie B. Pascal C. Joule D. Watt

   vi) Liquid A has a density of 13.6g/cm^3 and liquid B has a density of 1.25g/cm^3. A hydrometer will sink
   A. More in A than B B. More in B than in A
   C. Equally in both A and B D. None of the above

   vii) The variation between pressure and area is when
   A. Changing area, nothing happens
   B. Decreasing area, pressure decrease
   C. Decreasing pressure, volume increase
   D. Increasing area, pressure decrease

   viii) When a body of mass M is lifted through a height h, it possesses the energy known as
   A. Kinetic energy C. Chemical energy
   B. Light energy D. Potential energy

ix) The process of removing magnetism from a magnetic material
A. Polarization B. Magnetization C. Demagnetization D. Magnetizing

x) The property of solid state is
A. Inter-particles distance is large
B. Particle are closely packed together
C. Particles are not closely packed together
D. Particles move randomly

ANSWERS

i	ii	iii	iv	v	vi	vii	viii	ix	x

2. Match uses in LIST A with their corresponding instruments / devices in LIST B by writing its letter in the table below.

LIST A	LIST B
i) Measure length, depth, internal and external diameters. ii) Measure force of pull. iii) Transfer specific amount of liquid from one container to another. iv) Measure body temperature. v) Measure any amount of volumes of liquids. vi) A simple piston pump that injects liquid. vii) Indicate whether a surface is vertical or horizontal. viii) A pump used to lift heavy load ix) Used to see over an obstacle from a hidden position. x) It enables a liquid to flow without pumping due to pressure difference.	A. Pipette B. Bicycle pump C. Sprit level D. Manometer E. Spring balance F. Lift pump G. Measuring cylinder H. Vernier calliper I. Force pump J. Periscope K. Syringe L. Siphon M. Hydraulic press N. Thermometer

ANSWERS

i	ii	iii	iv	v	vi	vii	viii	ix	x

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

   i) The quantity of space that an object occupies is known as _____

   ii) A body move with a uniform _____, if its rate of change of displacement with time is _____ .

   iii) The causes of an object to rotate or turn about a fixed point is _____.

   iv) The force due to gravity produces _____ when it acts on a body.

   v) The sun's rays travel _____ at a speed of _____ m/s

   vi) The force which opposes the relative velocity between the layers is referred to as _____.

   vii) The formation of shadow is evidence that light _____.

   viii) The process of inducing magnetism in a magnetic material is _____.

   ix) A ship floats in water due to the fact that its _____ become less than that of the water in which it floats.

   x) The attraction force between same molecules is called _____.

SECTION B: (50 Marks)

Answer ALL questions in this section

4. a) Define the following terms

i) Speed

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ii) Uniform acceleration

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b) Differentiate between uniform acceleration and uniform deceleration

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c (i) A car travels at a speed of 10m/s accelerates uniformly at 20m/s^2. Find its velocity in 5s.

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(ii) A train slows from 20m/s with a uniform deceleration of 2m/s^2. How long will it take to reach 5m/s.

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5. a) Mention three (3) factors that affect the capacitance of a conductor.

   i) _____

   ii) _____

   iii) _____

   b) Mention types of mechanical energy.

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   c) A body of mass 15kg is raised to a height of 7metres above the ground in 4 seconds.

      i) Find the energy possessed by the body after raising it.

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ii) What is the type of energy possessed by the body?

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6. a (i) What do you meant by the term momentum?

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(ii) Write its S. I Unit _____

b) State the principle of conservation of linear momentum.

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c) A rocket expels gas at a rate of 0.5Kg/s. If the force produced by the rocket is 100N. What is the velocity with which the gas is expelled?

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7. a) What is Fulcrum?

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b) Give two (2) applications of lever.

(i) _____

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(ii) _____

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c (i) Using a principle of lever, explain why it is easier to open the door by pushing near the knob than by pushing near the hinges.

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(ii) What class of lever is a door?

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8. a) What is meant by the term concurrent forces?

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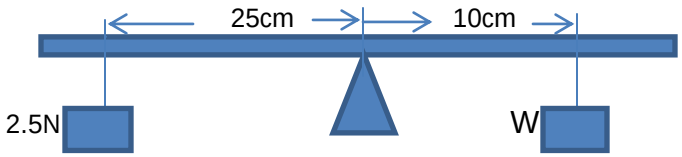
b) Give four (4) applications of equilibrium in our daily life.

c) A metre rule is pivoted and balanced as illustrated by the diagram below and balanced by a force of 2.5 N. Calculate the weight W.



SECTION C: (20 Marks)

Answer any two (2) questions from this section.

Question 9 is COMPULSORY; answer either (9a) or (9b)

9 a) In the experiment to determine the mass (M) of wooden meter rule the length x and y were recorded. Given that y is the distance from centre to the known mass and x is the distance from centre to the unknown mass. The following results were obtained.

y (cm)	5	10	15	20	25
x (cm)	12.5	24.3	36.2	48.4	60.1

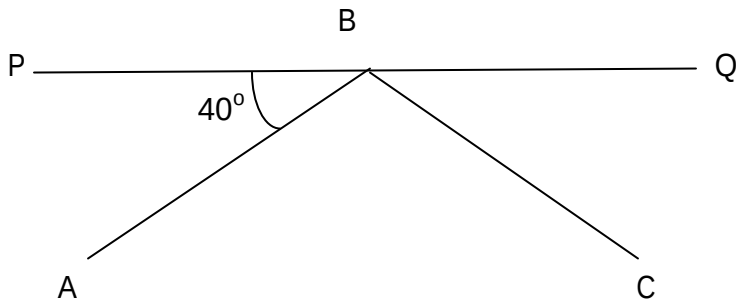
i) Draw a graph of y against x on the graph paper.

ii) Calculate the gradient, N of the graph.

iii) Calculate the mass, M of the wooden meter rule, where N = $\frac{50}{M}$

9. b i) Two mirrors are arranged such that they produce nine (9) images of a pin placed between them. Calculate the angle between the two mirrors.

ii) The diagram below shows a ray of light AB that is reflected from a plane mirror PQ. Find the size of angle ABC.



iii) When two plane mirrors are placed at an angle of 45^{o}. How many images are formed?

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10. a) State fundamental law of static electricity.

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b) i) Mention three (3) categories of a magnet.

a._____

b._____

c._____

ii) Differentiate between angle of declination and angle of dip.

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c. Draw diagram of a magnetic line of force between two bar magnets such that.

i) North poles facing each other.

ii) North pole of one face, south pole of other.

11. a i) What are sustainable energy source?

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ii) State four (4) applications of energy generated from solar.

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b i) Define geothermal energy.

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ii) List three (3) areas where geothermal energy can be harnessed.

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c i) What is a wind mill?

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ii) Mention three (3) disadvantages of energy caused by wind.

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ROUGH WORK