**Candidate's Examinatio**n Number _____

SMZ

ZANZIBAR EXAMINATIONS COUNCIL

FORM THREE ENTRANCE EXAMINATION

042 PHYSICS

TIME: 2:30 Hours WEDNESDAY 5th DECEMBER, 2018 a.m.

INSTRUCTIONS TO CANDIDATES

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 NINE (9) is compulsory.
3. Write your examination number on each page.
4. Write your answers in the space provided.
5. Write your answer in blue or black pen. Diagram must be drawn in pencil.
6. Cellular phones are not allowed in the examination room.
7. Where necessary the following constants may be used.
   i) Acceleration due to the gravity, g = $10m/s^2$
   ii) Pie, $\pi$ = 3.14

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

This paper consists of 16 printed pages

SECTION A: (30 Marks)

Answer ALL questions in this section

1. Write the letter of the most correct answer in the table below:

(i) The aim of Physics is to understand the

A. Man and his surroundings

B. Moon, sun, stars and planets

C. Behaviour of the universe

D. Matter and energy

(ii) Which of the following is a derived unit?

A. Kilogram B. Ampere

C. Kelvin D. Newton

(iii) The weight of a body in air is

A. Floating of a body B. Apparent weight

C. Swinging of a body D. Real weight of a body

(iv) A load of 100N is lifted by a force of 50N using a lever. What is the Mechanical advantage of the lever?

A. 150 B. 50 C. 2 D. ½

(v) An image formed in a plane mirror is always

A. Virtual B. At infinity

C. In front of the mirror D. Real

(vi) Potential energy depends on

A. Volume B. Height

C. Area D. Time

(vii) Which phenomenon is taking place when kerosene rises up a wick?

A. Surface tension B. Elasticity

C. Capillarity D. Meniscus

(viii) Magnets are often fitted on the doors of freezers so as to

A. Keep away heat B. Keep the inside environment warm

C. Keep away cold D. Keep iron away

(ix) The reason for the stone and piece of iron in the air to fall down at the same time

A. They have the same weight

B. There is usually no resistance in the air

C. Acceleration due to gravity is the same

D. None of the above

(x) Which of these resources of energy is non renewable?

A. Wave energy

B. Bio fuel

C. Radiant energy

D. Fossil fuel

ANSWERS

| i | ii | iii | iv | v | vi | vii | viii | ix | x |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

2. Match the item in LIST A with responses in LIST B by writing the letter of correct response in the table below.

| LIST A | LIST B |
|---|---|
| i) Time<br>ii) Pascal<br>iii) Temperature<br>iv) $\frac{Force \times velocity}{g}$<br>v) Mechanical energy<br>vi) Electromotive force<br>vii) Hydrometer<br>viii) Stores charge<br>ix) Neutral point<br>x) Electrophorus | A. Magnetic field is zero<br>B. Degree of hotness or coldness<br>C. Kinetic energy<br>D. Derived quantity<br>E. Capacitor<br>F. Momentum<br>G. Fundamental quantity<br>H. $N/m^2$<br>I. Used to measure relative density of liquid<br>J. Used as a match box<br>K. Weight<br>L. The driving force of electric cell<br>M. Cylinder<br>N. N/kg<br>O. Demagnetisation |

ANSWERS

| i | ii | iii | iv | v | vi | vii | viii | ix | x |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

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

i) Weight has the same unit as _____.

ii) In the velocity time graph, the slope represents _____.

iii) The type of force which causes the size and volume of an object to decrease is known as _____.

iv) Human skin is an _____ that are sensitive to temperature

v) The angle between magnetic north and geographical north is _____.

vi) A block of copper, size $5cm \times 5cm \times 10cm$, has capacity of _____.

vii) Power is the rate at which _____ is being done.

viii) The rate of change of momentum is _____.

ix) The beam balance used to measure _____ of an object.

x) The partial shadow is called _____.

## SECTION B: (50 Marks)
Answer ALL questions in this section

4. (a) Define the following terms

i) Elasticity

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ii) Osmosis

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b) Why are dams constructed thicker at the bottom than at the top?

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c) The mass of cuboid is 60kg, if it measures 50cm by 30cm by 20cm. What is the maximum pressure that it can exert.

5. a) Define the term power and state its S. I. Units.

b) Mention three (3) areas where power is applied.

c) A truck for transporting sand is filled to its capacity. If the digger had to move through a height of 2 metres and the total load was 5000kg. Calculate:

i) The work done in loading the sand.

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ii) The power developed in 5 seconds,

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6. a) State Newton's first law of motion.

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b) Differentiate between inertia of motion and inertia of direction.

| INERTIA OF MOTION | INERTIA OF DIRECTION |
|---|---|
| | |

c) Briefly explain the following situations

i) Mangoes fall down when the mango tree is shaken.

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ii) Dust particles are removed from a carpet by beating with a stick

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iii) When passenger jumps into a moving train, he falls backwards

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7. a) Define the following terms
   i) Thermometer

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   ii) Constriction

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b) Name three (3) types of thermometer

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c) State three (3) reasons why mercury is preferred for use as a thermometric liquid.

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8. a) Define the following terms
   i) Efficiency.

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ii) Fulcrum

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b) List down three (3) most common types of simple machine.

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c) A handle of the screw – jark is 40cm long and the pitch of the screw is 0.5cm. what force must be applied to the end of the handle when lifting a load of 2400N if the efficiency of the jark is 40%.

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SECTION C: (20 Marks)

Answer any two (2) questions from this section.

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

9. a) In an experiment to determine the density of irregular object the following results were obtained.

| Mass (g) | Volume ($cm^3$) | $Density$ ($g/ cm^3$) |
|---|---|---|
| 100 | 100 | |
| 150 | 150 | |
| 200 | 200 | |
| 250 | 250 | |
| 300 | 300 | |

i) Complete the table above

ii) Plot a graph of mass against Volume (on the graph paper)

iii) State the nature of the graph

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iii) Find the slope of the graph

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iv) What does the slope of the graph indicate?

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9. b) Complete the table below

| SN | Name of device | Sketch | Application / Uses |
|---|---|---|---|
| i) | Micrometer screw gauge |  | |
| ii) | |  | To measure body temperature |
| iii) | A ruler | | |
| iv) | Spring balance | | |
| v) | |  | |

10. (a) Explain briefly the relationship between

i) Physics and chemistry

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ii) Physics and biology

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iii) Physics and mathematics

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b i) Give two (2) examples of items in chemistry that use the application of physics

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ii) Give two (2) concepts in Mathematics that is relevant to the study of physics

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11. a i) What is meant by sustainable energy sources.

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i) List three (3) sources of sustainable energy.

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b) State:

i) Two (2) advantages of wind energy.

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ii) Two (2) disadvantages of wind energy.

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(c) Mention two (2) areas where geothermal energy can be harnessed.

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FOR ROUGH WORK

