Candidate's Examination Number.....

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
FORM TWO NATIONAL ASSESSMENT

031 **PHYSICS**

Time: 2:30 Hours **Thursday, 15th November 2018 a.m.**

Instructions

1. This paper consists of sections A, B and C with a total of **ten (10)** questions.
2. Answer **all** questions.
3. All Answers must be written in the spaces provided.
4. All writing must be in blue or black ink **except** drawings which must be in pencil.
5. All communication devices, calculators and any unauthorized materials are **not** allowed in the examination room.
6. Write your **Examination Number** at the top right corner of every page.
7. Where necessary the following constants may be used:
   (i) Acceleration due to gravity, $g = 10m/s^2$.
   (ii) Density of water = $1g/cm^3$ or $1000kg/m^3$.

FOR EXAMINERS' USE ONLY		
QUESTION NUMBER	**SCORE**	**EXAMINER'S INITIALS**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
TOTAL		
ENTERERS'S INITIALS		
CHECKER'S INITIALS		

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SECTION A (30 Marks)

1. For each of the items (i) – (xx), choose the correct answer among the given alternatives and write its letter in the box provided.

(i) Any substance that has mass and occupies space is known as

A energy. B matter.

C universe. D nature.

(ii) A set of techniques used by scientists to investigate a problem refers to

A data interpretation. B scientific method.

C performing an experiment. D data presentation.

(iii) A vernier caliper is used to measure

A distance of a car. B diameter of a wire.

C mass of a car. D length of a table.

(iv) A force which prevent a body to slide is called

A stretching force. B restoring force.

C frictional force. D compressional force.

(v) The ability of a body to float in a fluid is known as

A the law of up thrust. B the law of Archimedes.

C the law of floatation. D floating.

(vi) One of the following is the condition for a body to float in water.

A The mass of a floating body is greater than displaced water.

B The density of the body must be less than the density of the fluid.

C The up thrust due to the liquid must be small than weight of body.

D The displaced water is less than the floating body.

(vii) In a solid state the force of attraction between molecules is greater because particles are

A closely packed together. B somehow apart.
C not closely packed together. D moved so randomly.

(viii) The phenomenon that is observed when maize flour poured on top of water is called

A diffusion. B capillarity.
C surface tension. D osmosis.

(ix) Density and height are factors which affect pressure in

A solid. B solid and liquid.
C liquid. D gas.

(x) When a body is performing a work, is said to have

A moment. B energy.
C momentum. D work.

(xi) Which of the following unit could be used for kinetic energy?

A Kg B N C JS D NM.

(xii) Materials that allows only part of light to pass through them are called

A transparent. B translucent. C opaque. D newton.

(xiii) What term refers to the stationary accumulation of charges on object?

A Current electricity B Static electricity
C Charging D Polarization

(xiv) The rate of flow of electrons in a material is called

A charging. B potential difference.
C electric current. D resistivity.

(xv) Which of the following materials can magnetically be made strong?

A Nickel and Copper
B Steel and Brass
C Cobalt and Iron
D Cobalt and Copper

(xvi) The point where the force of gravity can be considered to act is called

A centre of gravity.
B centre of mass.
C centre of weight.
D equilibrium.

(xvii) The rate of change of velocity of a body is known as

A uniform speed.
B acceleration.
C distance.
D displacement.

(xviii) Why the mechanical advantage is less than three in a single rope three pulleys system?

A Because the effort may vary.
B Due to load rose.
C Because the upper pulley does not move.
D Due to friction on pulleys.

(xix) The product of mass of a body and its acceleration is

A Newton's second law of motion.
B Law of inertia.
C Newton's third law of motion.
D Momentum change.

(xx) A form of energy that can be persistently used without running out is said to be

A efficient.
B renewable.
C non-renewable.
D effective

2. Match each item in **List A** with a correct response in **List B** by writing a letter of a correct response below the number of the corresponding item in **List A** in the table provided.

List A		List B	
(i)	The force used to operate a machine.	A	Knife.
(ii)	An example of 3rd class lever.	B	Lever.
(iii)	Ratio of number of teeth in a driven wheel to the number of teeth in driving wheel.	C	Inclined planes.
		D	Friction.
(iv)	The force that causes an efficiency of a machine to be less than 100%.	E	Wheelbarrow.
		F	Effort.
(v)	It is used to lift heavy weights with the least effort.	G	Velocity ratio.

Answers

List A	(i)	(ii)	(iii)	(iv)	(v)
List B					

3. Complete each of the following statements by writing the correct answer in the space provided.

(i) Mass of a body is defined as.....

(ii) The resultant of a force which overcomes resistance refers to.....

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(iii) A force which produces an acceleration of $1m/s^2$ in a mass of 1kg is called.....

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(iv) The proper term for a light which passes through different media is.....

(v) A point just after elastic limit is called.....

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SECTION B (50 Marks)

4. (a) State two conditions for a body to be in equilibrium.

(i) .....

(ii) .....

(b) Distinguish between centre of mass and centre of gravity.....

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(c) A uniform metre rule is balanced horizontally on a knife edge placed 5cm from B with a mass of 60g at B. Find the mass of the ruler.

5. (a) What is energy? .....

(b) Mention any four types of energy.

(i) .....

(ii) .....

(iii) .....

(iv) .....

(c) A min-bus of mass of one and a half tonnes is moving with kinetic energy of 30000J. What is its velocity in Km/h?

6. (a) List down four uses of hydraulic press.

(i) .....

(ii) .....

(iii) .....

(iv) .....

(b) Why a hole at the bottom of a ship is more dangerous than the one that is near the surface?.....

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(c) Calculate the pressure at the bottom of the sea water of 52m deep, if the density of water is 1025 Kg/m³. Take the acceleration due to gravity (g) as 10N/Kg.

7. (a) What is meant by acceleration? .....

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(b) In which case the acceleration is said to be uniform?.....

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(c) A car with a velocity of 90km/h is uniformly retarded and brought to rest after 10 seconds. Calculate its acceleration.

8. (a) Define the following terms as applied in Physics.

(i) Machine.....

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(ii) Load.....

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(b) Why efficiency of machine is less than 100%? Briefly explain.

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(c) Simple machine was used to raise a load of weight 4000 N through a height 0.8 m using an effort of 800 N. If the distance moved by effort was 4.8 m, calculate the:

(i) Mechanical advantage.

(ii) Velocity ratio

SECTION C (20 Marks)

9. (a) A water can has three holes punched the first at the bottom, the second at the middle and the third hole almost at the top. If water is filled in the can, how will the water spurt through the bottom and the top hole? .....

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(b) (i) Why is it easier to cut a piece of meat with sharp knife than when using blunt knife? .....

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(ii) The tip of a needle of hypodermic syringe has a cross-sectional area of $1 \times 10^{-6} m^2$. If a doctor applies a force of 20 N to a syringe that is connected to the needle, what is the pressure exerted at the tip of needle?

(c) The small piston of hydraulic press has an area of 3.0×10^{-4} m^2 and the bigger piston has an area of 2.0×10^{-2} m^2. The two pistons are in the same level. If the force of 120 N is applied to the small piston, calculate the force required to be applied to the bigger piston to stop it moving.

10. (a) Define the word coulomb.....

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(b) States Ohm's law.....

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(c) Two resistors of 3Ω and 6Ω are connected in parallel to a 3V battery.

(i) Draw the schematic diagram.

(ii) Find the effective resistance of the circuit.

(iii) Calculate the current passing through a 6Ω resistor.