

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION AND VOCATIONAL TRAINING
FORM TWO SECONDARY EDUCATION EXAMINATION, 2012

0031

PHYSICS

TIME: 2½ HOURS

INSTRUCTIONS

1. This paper consists of sections A, B and C.
2. Answer **ALL** questions.
3. **ALL** answers must be written in the spaces provided.
4. Read the instructions given in each section carefully
5. Write your examination number at the top right corner of every page.
6. **ALL** writing must be in blue or black ink **EXCEPT** drawings which must be in pencil.
7. Cellphones and calculators are not allowed in the examination room.
8. You may use the following constants in your calculations:
 Density of water = 1 g/cm³ or 1000 kg/m³
 Density of mercury = 13.6 g/cm³ or 13600 kg/m³
 Acceleration due to gravity = 10 m/s²
 At Standard Temperature and Pressure (STP): T = 273 K, P = 760 mmHG.

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

SECTION A (20 MARKS)

1. Write the letter of the correct answer in the box provided for each of the following questions.

- (i) Physics is the scientific study of nature which deals with
 - A. behaviour of the space
 - B. behaviour of the universe
 - C. conservation of energy only
 - D. reactions of matter.

- (ii) An auto mechanic wants to measure the length of an object in the accuracy of 0.01cm. Which of the following instruments can be used?
 - A. Metre rule
 - B. Micrometer screw gauge
 - C. Tape measure
 - D. Vernier calliper.




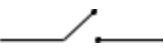
- (iii) A force of 50 N was applied on a spring. It caused the spring to extend by 1m. What force will cause the spring to extend by 0.6 m?
 - A. 0.003 N
 - B. 3 N
 - C. 30 N
 - D. 300 N

- (iv) If the upthrust is greater than the weight of a body, then the body:
 - A. floats imperfectly
 - B. floats perfectly
 - C. rises
 - D. sinks.

- (v) A piece of wood is floating in water. In this case the:
 - A. density of water is equal to the density of wood
 - B. density of water is less than the density of wood
 - C. upthrust of water is equal to the weight of wood
 - D. upthrust of water is greater than the weight of wood.

- (vi) The relationship between pressure and area is that on:
 - A. changing area, nothing happens
 - B. decreasing area, pressure decreases
 - C. decreasing pressure, volume increases
 - D. increasing area, pressure decreases.

- (vii) Small insects like mosquitoes are able to walk on the surface of water because of:
 - A. capillarity
 - B. plasticity
 - C. surface area
 - D. surface tension.

- (viii) A stone of mass 500 g is lifted through a height of 2 m. The energy possessed by the stone is known as:
 A. chemical energy
 B. kinetic energy
 C. mechanical energy
 D. potential energy.
- (ix) A negatively charged rod is brought near the cap of a negatively charged electroscope. The divergence of the gold leaf will:
 A. decrease
 B. decrease and then increase
 C. increase
 D. increase and then decrease.
- (x) Which of the following statements is not true for static electricity?
 A. An electroscope is used to measure electric current
 B. Charges concentrate on pointed parts than on flat parts of a charged body
 C. In an atom the number of protons equals to the number of electrons
 D. Like charges repel, unlike charges attract.
- (xi) The electric current is measured in:
 A. amperes
 B. coulombs
 C. volts
 D. watts.
- (xii) Which of the following is a symbol for a cell?
 A. 
 B. 
 C. 
 D. 
- (xiii) Magnets are often fitted on the doors of freezers so as to keep
 A. away cool air
 B. away temperature
 C. the door tightly closed
 D. the inside environment warm.

- (xiv) When walking a man exhibits the following equilibrium:
- A. clockwise
 - B. neutral
 - C. stable
 - D. unstable.
-
- (xv) A system of levers with a velocity ratio of 40 overcomes a resistance of 3000 N when an effort of 100 N is applied. Its efficiency is:
- A. 75%
 - B. 80%
 - C. 85%
 - D. 90%
-
- (xvi) The area under the curve of a velocity time graph represents:
- A. acceleration
 - B. distance covered
 - C. speed
 - D. velocity.
-
- (xvii) A passenger on a seat of a motorcycle which is in motion when immediately stops, tends to be thrown forward because one is obeying:
- A. Newton's first law of motion
 - B. Newton's second law of motion
 - C. Newton's third law of motion
 - D. The principle of motion.
-
- (xviii) The property of alcohol that makes it more suitable for use in thermometers to measure temperatures in the cold regions of the world is that, it:
- A. has high boiling point
 - B. has high freezing point
 - C. has low freezing point
 - D. is colourless
-
- (xix) The most available sustainable source of energy is:
- A. the sun
 - B. sea tides
 - C. water falls
 - D. wind.
-
- (xx) Meteorologists measure the highest and lowest temperatures of a day by using a:
- A. clinical thermometer
 - B. maximum thermometer
 - C. minimum thermometer
 - D. six's thermometer.
-

SECTION B (40 MARKS)

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

LIST A		LIST B	
(i)	A measure of turning effect	A.	A body in equilibrium
(ii)	Apparent weight of a floating body	B.	Capillarity
(iii)	Clockwise moments equal to anti clockwise moments	C.	Density bottle
(iv)	Effects of low pressure at high altitudes	D.	Measuring cylinder
(v)	Not used for making spectacles	E.	Moment of force
(vi)	The rising of oil in the wick of the lamp	F.	Nose bleeding
(vii)	Used for seeing objects which are out of direct vision	G.	Opaque material
(viii)	Used to determine relative density.	H.	Osmosis
		I.	Periscope
		J.	Translucent material
		K.	Upthrust is small
		L.	Zero.

ANSWERS

LIST A	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
LIST B								

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

- (i) A device that is used to test for the sign of charge is called _____
- (ii) In the First Aid Kit, a bandage or a plaster is used for _____
- (iii) The process of removing magnetism from a bar magnet is known as _____
- (iv) The type of frictional force experienced by a spherical body moving in water is called _____
- (v) The ratio of the mass of a body to its volume is called _____

4. (a) Define the term velocity _____
- (b) An object travelling at 8 m/s accelerates at 2 m/s^2 for 6 seconds. Calculate its final velocity.

5. (a) Define the following:
- (i) Mechanical advantage _____

 - (ii) Velocity ratio _____

 - (iii) Efficiency of a machine _____

(b) A simple machine was used to raise a load weighing 1000 N through a height of 5 m by applying an effort of 450 N. If the distance moved by the effort was found to be 25 m, find:

(i) Mechanical advantage

(ii) Velocity ratio

(iii) Efficiency of the machine

6. (a) Define pressure and state its SI unit _____

(b) A rectangular block weighing 350 N has dimensions 30 cm x 20 cm x 10 cm. Calculate the minimum pressure of the block.

SECTION C (40 MARKS)

7. (a) Define the following:

(i) An ammeter _____

(ii) A voltmeter _____

(iii) A resistor _____

(b) You are given a set of the following: a switch, a cell, an ammeter, a voltmeter, a resistor and connecting wires. Draw a complete circuit diagram to show the arrangement such that the current can flow.

8. (a) Mention two natural sources of light.

(i) _____

(ii) _____

(b) Give reason as to why we can not see around corners.

(c) Draw the diagrams that show the difference between diffuse and regular reflections.

(i) Regular reflection	(ii) Diffuse reflection

9. (a) State Newton's second law of motion

(b) Two balls X and Y of masses 20 g and 15 g moving with velocity of 5 m/s and 3 m/s respectively in the same direction collide and couple together. With what velocity will they move after collision?

10. (a) State the law of flotation _____

(b) A piece of cork of volume 100 cm^3 and density of 0.25 g/cm^3 is floating on water. Calculate the:

(i) Mass of the cork

(ii) Volume of the cork immersed in water.