Candidate's Examination No.....

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. Write your examination number at the top right corner of every page.
5. **ALL** writing must be in blue or black ink **EXCEPT** drawings which must be in pencil.
6. Cellphones and calculators are not allowed in the examination room.
7. You may use the following constants in your calculations:
   Density of water = 1 g/cm^3 or 1000 kg/m^3
   Density of mercury = 13.6 g/cm^3 or 13600 kg/m^3
   Acceleration due to gravity = 10 m/s^2
   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		

This paper consists of 8 printed pages.

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SECTION A (20 MARKS)

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

(i) Physics can be defined as the study of:
A. behaviour of living things
B. composition and decomposition of matter
C. man and his environment
D. matter in relation to energy.

(ii) The following instruments are used to measure length **except**:
A. hydrometer
B. metre rule
C. micrometer screw gauge
D. vernier calliper.

(iii) A force exerted by a pressure of 20 Pa acting over an area of 2 m^2 is:
A. 10 N
B. 18 N
C. 22 N
D. 40 N

(iv) A bunsen burner has a massive and wide base in order to:
A. lower its centre of gravity
B. make it give out good flame
C. raise its centre of gravity
D. support it on the surface.

(v) A body which gains electrons will attract a:
A. body which has gained neutrons
B. negative charged body
C. neutral body
D. positively charged body.

(vi) Pressure in a liquid contained in a vessel depends on:
A. density
B. depth
C. mass
D. surface area.

(vii) The energy from hot rocks within the earth is called:
A. biomass
B. coal-burning
C. geothermal
D. tidal.

(viii) Materials which allow only a small portion of light to pass through are called:
A. opaque
B. penumbra
C. translucent
D. transparent.

(ix) Measurement of mass using an equal arm balance lever is an application of the principle of:
A. conservation of energy
B. conservation of linear momentum
C. conservation of mass
D. moments.

(x) A current of 0.2 A flows through a resistor of 20 Ω. The potential difference across the resistor is:
A. 0.04 V
B. 4 V
C. 40 V
D. 400 V

(xi) Strong and permanent magnets are made up of:
A. aluminium and nickel
B. cobalt and nickel
C. iron and magnesium
D. nickel and silver.

(xii) A lever which has its fulcrum between effort and load is said to be of:
A. first class
B. fourth class
C. second class
D. third class.

(xiii) Which of the following is true about atmospheric pressure?
A. Decreases as one moves above the sea level
B. Increases as one moves above the sea level
C. Is greater than one's internal body pressure
D. Is higher on the moon than on the earth.

(xiv) The product of force and displacement is known as:
A. energy
B. momentum
C. power
D. work done.

(xv) A body moved a distance of 200 cm in 2 seconds. Its velocity in SI units was:
A. 1 m/s
B. 100 m/s
C. 400 m/s
D. 4000 m/s

(xvi) A passenger in a bus which starts to move forward tends to fall backwards. This phenomenon demonstrates:
A. Newton's first law of motion
B. Newton's second law of motion
C. Newton's third law of motion
D. The law of conservation of linear momentum.

(xvii) The boiling point of pure water at sea level is:
A. 0 °F
B. 100 °F
C. 200 °F
D. 212 °F

(xviii) Forces that exist between molecules of the same substance are called:
A. adhesive
B. attractive
C. cohesive
D. repulsive.

(xix) An image formed in a plane mirror is always:
A. larger than the object
B. smaller than the object
C. real
D. virtual.

(xx) Motor vehicle tyres are made up of grooved rubber in order to:
A. decrease speed of the vehicle on the road for safety purposes
B. decrease stability of the tyres on the road
C. increase friction between tyres and the road for safety braking
D. increase speed of the vehicle on the road.

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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)	Distance travelled per unit time	A. Ammeter
(ii)	Earth is between the sun and the moon	B. Capillarity
(iii)	Force is directly proportional to the extension	C. Fahrenheit
(iv)	Friction between the layers of fluids	D. Hooke's law
(v)	Instrument for measuring electric current	E. Impulse
(vi)	Measures gas pressure	F. Kelvin
(vii)	Momentum change	G. Lunar Eclipse
(viii)	Thermodynamic temperature.	H. Manometer
		I. Moment
		J. Speed
		K. Velocity
		L. Viscosity.

ANSWERS

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

3. (a) Differentiate between:
   (i) Scalar and vector physical quantities.

   .....

   .....

   (ii) Kinetic and potential energies.

   .....

   .....

(b) Give two differences between mass and weight of an object.

(i) .....

.....

(ii) .....

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4. (a) Elasticity can be defined as .....
.....

(b) Mention two methods by which a magnetic substance can be turned into a magnet.
(i) .....
(ii) .....

(c) Two types of intermolecular forces are:
(i) .....
(ii) .....

5. (a) Three states of matter are:
(i) ..... (ii) .....
(iii) .....

(b) Lubricants are mostly applied in machine parts in order to:
.....

(c) Draw magnetic lines of force of a bar magnet showing its poles.

6. (a) Mention three states of equilibrium.
(i) ..... (ii) .....
(iii) .....

(b) Calculate the mechanical advantage of a simple machine which has a velocity ratio of 5 and efficiency of 80%.

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SECTION C (40 MARKS)

7. (a) Define each of the following terms as applied in Physics:
   (i) Work .....
   (ii) Energy .....
   (iii) Power .....
   (iv) Density .....

   (b) A force of 10 N acts on a stationary object of 5 kg. This action causes an object to move along a smooth horizontal surface for 8 seconds before stopping. What is the velocity of the object?

8. (a) Explain briefly why:
   (i) Water tanks have their outlets fixed at the bottom?
   .....
   .....
   .....
   .....

   (ii) A tractor with wide tyres cannot easily get stuck in muddy places as compared to vehicles with narrow tyres?
   .....
   .....
   .....
   .....

   (b) Calculate the maximum pressure exerted by a block of mass 150 kg and surface dimensions of 4 m by 6 m by 8 m resting on the table.

9. (a) State the following:

(i) Archimedes' Principle.....

.....

(ii) Law of flotation.....

.....

(b) A body has mass of 120 g and volume of 100 cm^3. Will the body sink or float in water? Give reason for your answer.

10. (a) State Ohm's law.

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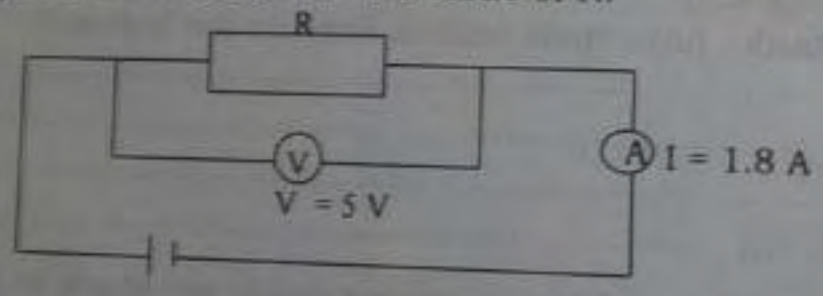
(b) In the diagram below calculate the value of R.



(c) A potential difference of 10 V is applied across parallel resistors of 2 Ω and 4 Ω. Calculate the current in the circuit.