THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION AND VOCATIONAL TRAINING
FORM TWO SECONDARY EDUCATION EXAMINATION, 2008

0031 **PHYSICS**

Time: 2 Hours

Instructions

1. This paper consists of sections A, B and C.
2. Answer **ALL** questions
3. Read carefully the instructions given in each section.
4. Write your examination number on every page.
5. Cellphones and calculators are not allowed in the examination room.
6. Whenever necessary use the following constants:

   Density of water = 1 g/cm^3

   Acceleration due to gravity = 10 m/s^2

SECTION A

1. Answer all questions in this section by writing the letter of the correct answer beside the question number.

(i) The study of matter in relation to energy is best covered in:
A. Agriculture
B. Biology
C. Chemistry
D. Physics

(ii) A student gets an electric shock and falls down unconscious in a Physics laboratory. Which of the following would you do first to help the victim:
A. administer breathing exercise
B. call the physics teacher
C. call other students
D. call a medical doctor

(iii) An engineer wanted to measure the diameter of a wire to the accuracy of three decimal places. Which of the following instrument would you recommend to be used?
A. Engineers' calipers
B. Micrometer screw gauge
C. Metre rule
D. Vernier callipers

(iv) Sunflower cooking oil and water were mixed and poured into a Pyrex glass measuring cylinder and allowed to settle for three minutes. Which of the following observations was true after three minutes?
A. The cooking oil floating on water
B. Meniscus of water appeared convex in shape at the surface
C. Water floating on the cooking oil
D. Water and cooking oil completely mix

(v) Work and energy have the same SI unit called:
A. Calorie
B. Joule
C. Pascal
D. Watt

(vi) Weight is a force by which:
A. a body is kicked upwards
B. An object is pulled towards the centre of the Earth
C. An object is pulled towards the ground
D. Mass and weight are related

(vii) A drop of water and a drop of mercury were poured separately on a clean glass surface. Which of the following conclusions would you make after making observations on the water and mercury?

A. Mercury has a greater cohesive force than water.
B. Mercury on glass shows a greater adhesive force than water.
C. Mercury and water have equal adhesive forces.
D. Water has a greater cohesive force than mercury.

(viii) An egg was immersed in a transparent liquid contained in a glass beaker. The egg was observed to float fully immersed in the middle of the liquid. What conclusion can you make from the observation?

A. The density of the egg is less than that of the liquid.
B. The density of the egg is greater than that of the liquid.
C. The egg and liquid have the same density.
D. The upthrust on the egg is equal to the weight of the egg in air.

(ix) Pressure in a liquid contained in a vessel depends on:

A. density
B. depth
C. mass
D. surface area

(x) In a three pulley system the Velocity Ratio (VR) is given as:

A. 3
B. 6
C. 1/6
D. 1/3

(xi) The area under the curve of a velocity-time graph represents:

A. acceleration
B. distance covered
C. speed
D. velocity

(xii) A house building contractor fitted window glass panes which someone cannot see through, but the rooms are fully illuminated with light. These types of glass pane materials are said to be:

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

(xiii) Tobacco leaves being dried outside in an open space receive heat from the sun through a process known as:

A. conduction
B. convection
C. evaporation
D. radiation

(xiv) A chemical engineer who wanted to know the level of hotness of the liquid to be used in a chemical process should measure its:

A. density
B. heat
C. temperature
D. volume

(xv) Motor vehicle tyres are made of grooved rubber in order to:

A. decrease stability of the tyres on the road
B. decrease the speed of the tyres on the road
C. increase friction between the tyres and the road for safe braking
D. increase the speed of the tyres on the road

(xvi) A railway mechanical engineer wants to eliminate thermal expansion effects on the rails. The engineer should:

A. avoid thick rails
B. avoid stainless iron rails
C. leave rail supports unscrewed
D. leave space between the rails

(xvii) If point A is at 100C while point B is at 25 C, then heat energy:

A. is the same at both points A and B
B. will flow from point B to point A
C. will not flow at all
D. will flow from point A to point B

(xviii) Water can exist in three states, namely:

A. ice, liquid water and water vapour
B. liquid, solid and fluid
C. liquid water, solid and gas
D. vapour, gas and ice

(xix) Current electricity is measured in:

A. amperes
B. coulombs
C. ohms
D. volts

(xx) The direction along which a magnetic compass North Pole would tend to move if placed in a magnetic field is called the line of:

A. demagnetization
B. flux
C. magnetism
D. neutral point

SECTION B

2. Match the items in **List A** with responses in **List B** by writing the letter of the correct response beside the item number.

List A		List B	
(i)	Apparent loss in weight	A	Anomalous expansion of water
(ii)	Converts solid into liquid	B	Equilibrium
(iii)	Fulcrum between Load and Effort	C	First class lever
(iv)	Load between Fulcrum and Effort	D	Heat energy
(v)	Occurs between 0 C and 4 C	E	Latent heat
(vi)	Occurs when the anticlockwise moments balance clockwise moments	F	Principle of moment
		G	Upthrust
(vii)	The force acting per unit mass	H	Second class lever
(viii)	When lost cooling occurs	I	Weight

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

Answer questions 3 – 5 by filling in the correct answers in the spaces provided.

3. a) The rate of change of distance moved with time in a specific direction is called _____.

   b) The slope of a velocity-time graph represents _____.

   c) Write the two laws of reflection of light.

      (i) _____

      (ii) _____

4. a) Three states of equilibrium are:

      (i) _____

      (ii) _____

      (iii) _____

   b) A rigid body which when in use turns about a pivot or fulcrum is called a _____.

   c) A grooved wheel which is free to turn about an axle fixed in a frame is called a _____.

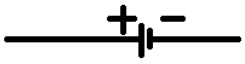
5. a) Heat capacity is defined as _____.

   b) A body of mass 10 kg is raised to a height of 4 metres above the ground. The type of energy possessed by the body is called _____ and the energy possessed by the body

is _____.

c) The relative density of a body of density 8,000 kg/m^3 is _____.

6. a) Name the following electrical symbols.

(i) 

(ii) 

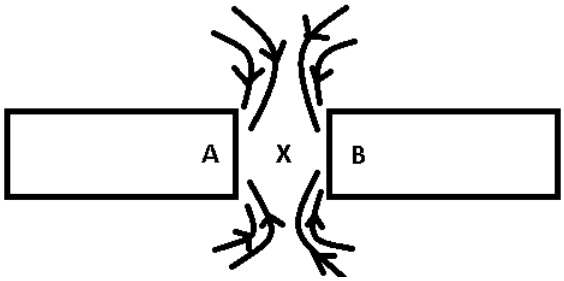
(iii) 

(iv) 

(v) 

(vi) 

b) In the diagram below



(i) A and _____ represent _____

(ii) X is _____

SECTION C

7. A stone is thrown vertically from the ground with a velocity of 20 m/s. Calculate the maximum height reached.

8. a) State Ohm's Law.

   b) A 12 volt battery is connected across a resistor of 15 ohms.

      (i) Draw an electrical circuit showing the stated components and the direction of flow of current.

      (ii) Calculate the moment of current flowing.

9. a) Calculate the pressure exerted on an area of 10 m^2 by a force of 2 N.

   b) A piece of metal of mass 40 g absorbs 320 J of heat on warming from 30 C to 5 C. Find the specific heat capacity of the metal.

10. A load of 500 Newton is raised through 5 metres by a machine when its effort moves simultaneously through a distance of 25 metres along its direction. If the machine has an efficiency of 80% calculate the value of the effort and the total work done by the machine.