THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION AND VOCATIONAL TRAINING
FORM TWO SECONDARY EDUCATION EXAMINATION, 2007

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.

SECTION A

This section consists of twenty multiple choice questions. Answer ALL questions in this section by writing the letter of the correct answer in the box provided.

1. (i) Physics is the study of relationship between
   A. matter and energy.
   B. energy and Chemistry.
   C. matter and Biology.
   D. matter and medicine.

   (ii) Laboratory rules are useful in
   A. making students enjoy science subject.
   B. making students conduct experiments freely.
   C. ensuring safety while in the laboratory.
   D. ensuring good communication with other students and the teachers.

   (iii) Measurement in Physics is a process of
   A. calculating and measuring.
   B. beam balancing.
   C. using spring balance.
   D. assigning numbers to observations and events.

   (iv) The SI unit of density is
   A. kg/m^3.
   B. kg/m^2.
   C. g/m^3.
   D. g/m^2.

   (v) The force that causes twisting of an elastic material is called
   A. restoring force.
   B. torsional force.
   C. compressional force.
   D. stretching force.

   (vi) When a body floats on a liquid, its
   A. weight is greater than the upthrust.
   B. weight is equal to the upthrust.
   C. weight is less than the upthrust.
   D. volume is greater than the volume of liquid displaced.

(vii) The molecules of water and those of glass will attract each other by a force known as
A. adhesive force.
B. cohesive force.
C. viscosity.
D. osmotic pressure.

(viii) Manometer is used for measuring
A. temperature.
B. wind speed.
C. gas pressure.
D. density of liquid.

(ix) A force exerted by a pressure of P N/m^2 and acting over an area of A m^2 is
A. P Newton.
B. A Newton.
C. F Newton.
D. PA Newton.

(x) The temperature of a body is defined as the degree of
A. measurement.
B. heating.
C. cooling.
D. hotness or coldness.

(xi) Which of the following is the best reason for using alcohol in a minimum thermometer?
A. It has a low freezing point.
B. It has a high freezing point.
C. It has low expansivity.
D. It is less expensive.

(xii) Work and energy have the same SI unit called
A. calorie.
B. joule.
C. watt.
D. paschal.

(xiii) The image which is formed on a plane mirror is
A. diminishing, real, laterally inverted.
B. the same size as the object, virtual and laterally inverted.
C. real, magnified, same size as object.
D. magnified, vertical, laterally inverted.

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

(xv) When work output is equal to work input, it is called
A. principle of momentum.
B. principle of work.
C. principle of energy conservation.
D. principle of moments.

(xvi) A bus carrying a heavy load on its topmost carrier can easily overturn when negotiating a corner because its
A. equilibrium is neutral.
B. centre of gravity is low.
C. centre of gravity is normal.
D. centre of gravity is high.

(xvii) The heat energy used to break bonds between molecules during melting process and to build bonds during freezing process is called
A. heat capacity.
B. latent heat.
C. radiant energy.
D. thermal energy.

(xviii) A person standing in a bus which starts to move forward, suddenly tends to fall backwards. This tendency obeys
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 moments.

(xix) The resistance of a lamp operating on a line of m volts and drawing a current of n amperes is
A. n/m ohms.
B. n ohms.
C. mn ohms.
D. m/n ohms.

(xx) Magnetic materials can be magnetized in three different methods namely
A. stroking, burning and electrical methods.
B. stroking, electrical and induction methods.
C. burning, induction and hammering methods.
D. hammering, burning and demagnetizing methods.

SECTION B

2. Match the following items by writing the letter of the correct meaning from list B against the number of the item in list A in the table below at the end of the question.

List A		List B	
(i)	Isulator	A	Product of force and its perpendicular distance from the point of application of the force
(ii)	Osmosis	B	Measures weight
(iii)	Penumbra	C	Opposes motion
(iv)	Moment	D	Moment change
(v)	Voltmeter	E	Instrument for measuring potential difference
(vi)	Friction	F	Instrument for measuring relative density
(vii)	Spring balance	G	Movement of molecules from region of high concentration to low concentration
(viii)	Translucent object	H	Osmotic pressure
		I	Movement of molecules from region of low concentration to high concentration
		J	Used to measure current
		K	Measures mass
		L	Partial darkness
		M	Total darkness
		N	Allows light to pass through but human eye can not see through it
		O	Object that reflects all light falling on it
		P	Any material which does not allow passage of electricity or heat

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

Answer questions 3 – 6 by filling in the correct answers in the spaces provided.

3. a) A point at which the resultant magnetic flux density is zero is called _____.

   b) The ability of a substance to recover to its original shape and size after distortion is called _____.

   c) Lubricants are mostly applied in machine parts in order to _____.

   d) Water wets glass but mercury does not because _____.

4. a) Heat energy can be transferred by the following methods:

   (i) _____

   (ii) _____

   (iii) _____

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

5. a) A machine is _____.

   b) Briefly write the meaning of the following terms as used in Physics:

   (i) Mechanical Advantage of a machine _____
   _____
   _____

   (ii) Velocity Ratio of a Machine _____
   _____
   _____

   (iii) Efficiency of a machine _____
   _____
   _____

6. a) At sea level, boiling of water occurs at ____°C while evaporation occurs at _____ temperature.

   b) Evaporation occurs at the surface of the liquid while boiling occurs _____ the liquid.

   c) Two factors which can affect the melting point of ice are:

   (i) _____

   (ii) _____

SECTION C

Answer ALL questions in this section. All calculations and answers must be written in the spaces provided.

7. a) Write equation for
   (i) Charle's law

   _____
   _____
   _____

   (ii) Boyle's law

   _____
   _____
   _____

   b) Draw a diagram showing a plane reflecting surface, incident ray, reflected ray, the normal, angle of incidence and angle of reflection. What is the relationship between angle of incidence and angle of reflection?

8. Differentiate between mass and weight of an object. Give five differences.

	MASS		**WEIGHT**
(i)		(i)	
(ii)		(ii)	
(iii)		(iii)	
(iv)		(iv)	
(v)		(v)	

9. a) State Archimede's Principle.

b) An object weighs 500N in air and 400N when immersed in alcohol. Find the upthrust on the object.

10. a) A car with a velocity of 90 m/s is uniformly retarded and brought to rest after 10 seconds. Calculate its deceleration.

b) State the fundamental law of static electricity

c) Explain what is wrong in the circuit diagram shown below.

