Candidate's No. ……..

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION AND CULTURE
FORM TWO SECONDARY EDUCATION EXAMINATIONS, 2000

0031 **PHYSICS**

TIME: 2 HOURS

INSTRUCTIONS

1. This paper consists of sections A, B and C.
2. Answer all Questions in all three sections.
3. Section C should be answered on separate sheets of paper provided. In your calculations you are required to show clearly all the steps of your work in a systematic manner.
4. Whenever necessary use the following constants:
   Density of water = 1 g/cm^3 (or 1000 kg/m^3)
   Acceleration due to gravity g = 10 m/s^2
   S.T.P. means T = 273 K, P = 760 mmHg.

FOR EXAMINERS USE ONLY		
QUESTION NUMBER	**SCORE**	**INITIALS OF EXAMINER**
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29		
TOTAL		

This paper consists of 7 printed pages.

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SECTION A (40 MARKS)

This section consists of twenty (20) multiple choice questions. Answer ALL questions in this section by writing the letter of the correct answer in the box provided:

1. A piece of metal of volume 0.24 cm^3 and mass 0.72 g has a relative density of:
   A. 3.0 g/cm^3
   B. 3.0 kg/m^3
   C. 0.3
   D. 3.0

2. The similarity between velocity and speed lies in their:
   A. Units being the same
   B. Direction of travel
   C. Magnitudes being the same
   D. Covered distance being in the same direction

3. A lever which has its fulcrum between the effort and the load is said to be of:
   A. first class
   B. second class
   C. third class
   D. no class

4. Measurement of mass by using an equal arm balanced lever uses the principle of:
   A. Conservation of linear momentum
   B. Conservation of energy
   C. Conservation of mass
   D. moments

5. Pressure in liquids depends on:
   A. Area
   B. Volume
   C. Depth
   D. Mass

6. A potential difference of 12 volts is applied across a resistor of resistance 24 ohms. The current flowing in the circuit is:
   A. 0.5 A
   B. 0.05 A
   C. 0.005 A
   D. 0.0005 A.

7. An image that is formed in a plane mirror is always
   A. smaller than the object.
   B. Larger than the object
   C. Virtual
   D. Real

8. When a body floats in a liquid:
   A. its weight is less than the upthrust on it
   B. its weight is greater than the upthrust on it
   C. its weight is equal to the upthrust on it
   D. its volume is equal to the volume of liquid displaced.

9. A block of mass 1 kg is placed on top of a horizontal table. If the horizontal force required just to move the block is 19.6 N, then the coefficient of friction between the two surfaces is
   A. 0.31
   B. 0.02
   C. 04
   D. No correct answer

10. A temperature of 100°F is equal to:
   A. 33.3°C
   B. 37.8°C
   C. 47.8°C
   D. 73.3°C

11. A bus carrying a very heavy load on its topmost part can easily overturn because:
   A. it cannot run fast
   B. its equilibrium is neutral
   C. its centre of gravity is low
   D. its centre of gravity is high

12. A stone of mass 500 g is lifted through a height of 2 metres. The potential energy gained by the stone is:
   A. 100 J
   B. 40 J
   C. 70 J
   D. 10 J

13. The law which relates temperature and volume of gas at constant pressure is called:
   A. Boyle's Law
   B. Pressure Law
   C. Charles' Law
   D. Gas Law

14. A force of 25 N is used to move an object through a distance of 1.5 m in one minute. The power dissipated by the force is:
   A. 37.5 W
   B. 0.625 W
   C. 37.5 J
   D. 0.625 J

15. Heat travels through vacuum by:
    A. conduction
    B. radiation
    C. convection
    D. osmosis

16. The SI unit of current is the:
    A. volt
    B. Ohm
    C. Ampere
    D. Coulomb

17. The nucleus of an atom constitutes:
    A. protons, neutrons and electrons
    B. the positive charge
    C. the negative charge
    D. neutrons and electrons

18. All bodies which allow only part of light to pass through them are:
    A. transparent
    B. opaque
    C. penumbra
    D. translucent

19. The following are a good examples of strong magnetic materials:
    A. copper and glass
    B. nickel and cobalt
    C. cobalt and glass
    D. copper and nickel

20. One of the laws of reflection of light can be stated as follows:
    A. The angle of incidence and the angle of reflection are equal and opposite.
    B. The sum of the angle of incidence and the angle of reflection is a constant
    C. The speed of an incident ray is equal to that of the reflected ray.
    D. The angle of incidence is equal to the angle of reflection.

SECTION B (30% MARKS)

21. Match the following items by writing the letter of the correct meaning from list B against the number of the item in list A.
    Example: (i) is matched to letter (d) as shown in the table below:

Number of list A	(i)	(ii)	(iii)	(iv)	(v)	(vi)
Letter of list B	d					

LIST A	LIST B
(i) Temperature	(a) Total shadow
(ii) Torricelian vacuum	(b) The driving force of an electric cell
(iii) Penumbra	(c) Space above the simple barometer
(iv) Real image	(d) Degree of hotness or coldness of a body.
(v) Electromotive force	(e) Partial shadow.
(vi) Potential difference	(f) A force which drives an electric current through an electrical component.
	(g) Apparent intersection of light rays.
	(h) Actual intersection of light rays.

Answer questions 22 - 24 by filling in the correct answers in the spaces provided.

22. (i) Vernier callipers measure length to an accuracy of _____cm.

(ii) _____ is the force of attraction between two similar molecules while _____ is the force of attraction between two different molecules.

(iii) Magnification is defined by _____.

(iv) The Liquid used to prevent friction between moving machine parts is called _____.

23. (i) Resistors are components which are mainly used to _____ at different points in the circuit.

(ii) A device which is used to convert electrical energy into mechanical energy is called _____.

(iii) A body of mass 150 kg moving with a velocity of 2 m/s posses energy equal to _____.

(iv) Two of the laboratory safety rules are:

(a) _____

(b) _____

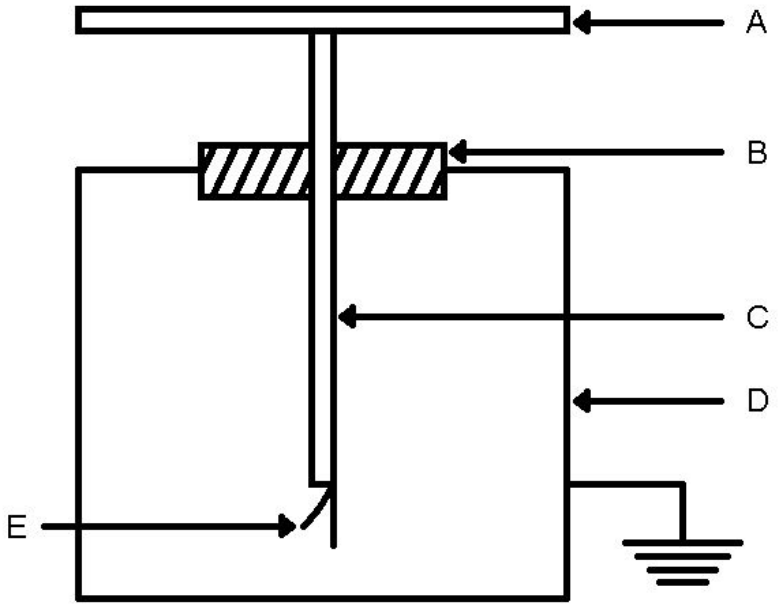
24. (i) The temperature of gas is 65°C. This temperature on the absolute scale is _____.

(ii) Traditionally, in experiments concerning static electricity, when an ebonite rod is rubbed with fur, it produces _____ electricity.

(iii) The process of removing magnetism from a metal is known as _____.

(iv) The ability of a body at rest to resist motion or a body to continue moving in a straight line unless compelled by some external force is called the _____ law of motion.

25. Below is a diagram of a gold leaf electroscope. Label the parts represented by letters A-D.

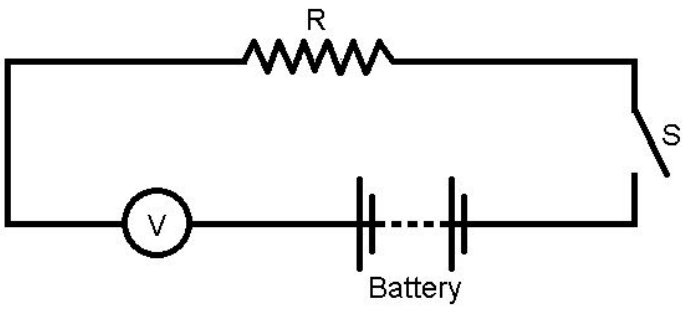


SECTION C (30 MARKS)

Answer all questions in this section.

26. (a) A Voltmeter connected across an electric appliance reads 3 volts and an ammeter in series with it reads 0.75 Amperes
(i) Draw the circuit to represent the above information
(ii) Calculate the resistance of the appliance.

(b) Say what is wrong with the following electrical circuit.



27. (a) (i) Distinguish between heat and latent heat

(ii) Calculate the amount of heat required to melt 800 g of ice at 0°C given that the specific latent heat of fusion of ice is 334400 J/kg.

(b) The smaller piston of a hydraulic press has an area of 20 cm^2 and is pushed downward with a force of 100 N. If the area of the larger piston is 500 cm^2, find the weight which can be supported.

28. (a) A pulley system has 5 pulleys and 5 strings supporting the bottom block.

(i) Draw a neat diagram to represent the system

(ii) Calculate the efficiency if a load of 100 N can be lifted by an effort of 25 N only.

29. (a) By use of diagram show the difference which exists between diffuse reflection and regular reflection.

(b) (i) State the principle of conservation of linear momentum.

(ii) A shot of mass 100 kg leaves a cannon of mass 5 tonnes with a velocity of 100 m/s.

Find the velocity of recoil of the cannon.

END