THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION AND CULTURE

FORM TWO SECONDARY EDUCATION EXAMINATION, 1992

0031

# PHYSICS

TIME: 2 Hours.

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1. This paper consists of sections A and B.
2. Answer ALL questions in both sections.
3. Answers for section A should be written in the spaces provided.
4. Answers for section B should be written on the answer papers provided and then tie them at the end of this paper.
5. Mathematical tables may be provided.

Acceleration due to gravity, $g = 9.8\ m/s^2$.

This paper consists of 6 printed pages.

## SECTION A

Answer ALL questions in this section in the spaces provided.

1. (i) The three basic physical quantities are

A. time, velocity, speed
B. density, mass, volume
C. length, time, mass
D. force, mass, acceleration.

(ii) The inside diameter of a cylinder can be measured accurately by using a

A. metre rule
B. micrometer screw gauge
C. vernier callipers
D. tape measure.

(iii) An object which has a mass of 2kg was raised 3.5m above the ground. The work done on the body was

A. 7.0 J
B. 70 J
C. 7.0 Watt
D. 70 Watt.

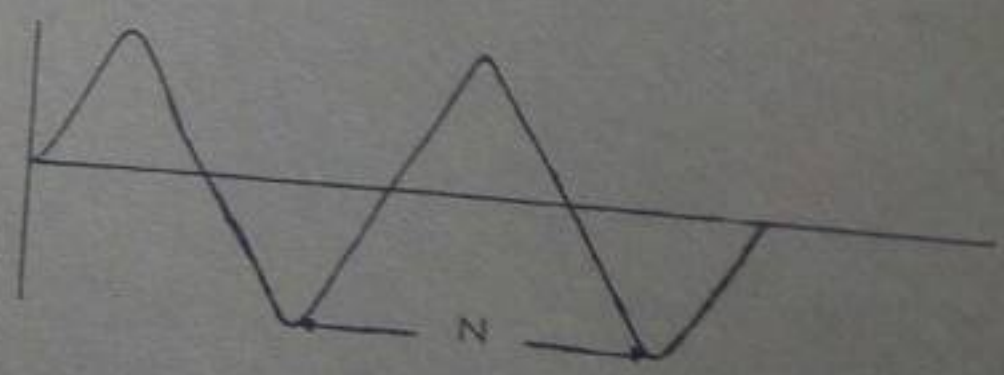
(iv) A glass block of weight 254g when immersed completely in water was found to weigh 154g only. Therefore the relative density of the block was

A. 2.5
B. 1.7
C. 0.6
D. 0.4.

(v) When a mercury barometer reads 76 cm, a water barometer will read approximately

A. 76m
B. 1.5m
C. 7.5m
D. 10m.

2. (i)




The distance marked N in the above diagram which shows part of a wave is called _____.

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

(iii) A point whereby the total weight of an object appears to be acting is called _____

(iv) If a simple machine has a velocity ratio of 5 and efficiency 80%, then its mechanical advantage is _____

(v) The force of friction that occurs when a body just starts to slide is called _____

3. (i) Two cells each of e.m.f. 1.5 volts are connected in series.

(a) Calculate the total e.m.f.

_____

_____

_____

(b) If a current of 0.5A flows in the circuit, what is the value of the resistor connected across the two cells.

_____

_____

_____

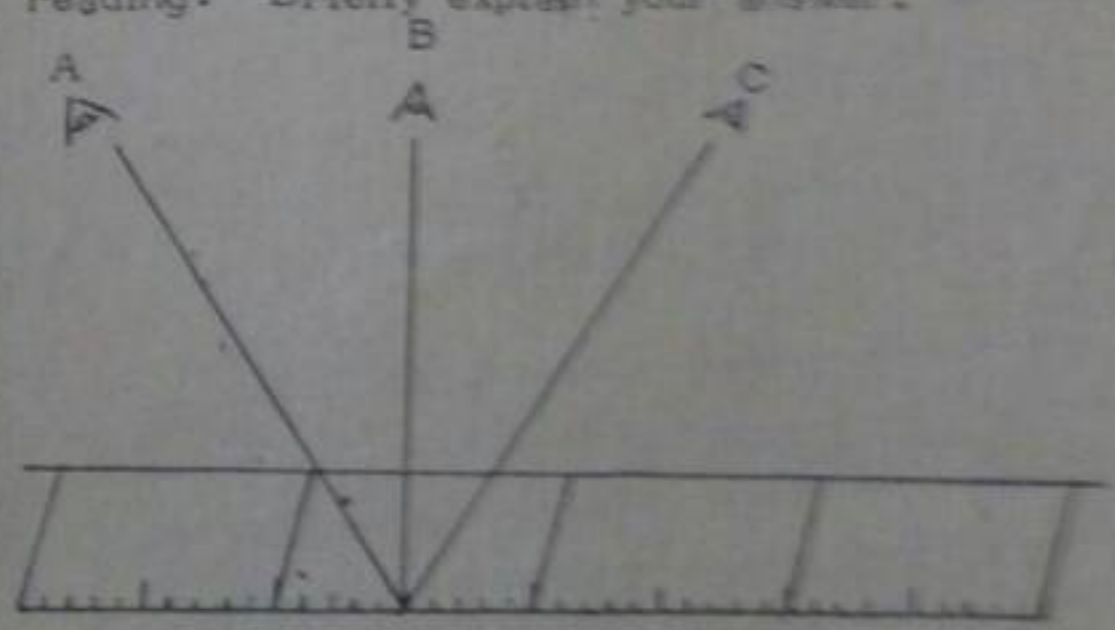
(ii) State the two (2) laws of Reflection of Light.

_____

_____

_____

(iii) The diagram below shows how you can obtain the length of an object by using a ruler from three different positions. Which position of the eye will give you the most correct reading? Briefly explain your answer.




_____

B. the weight of an object may be different in [illegible]

C. the mass of an object may be different in [illegible]

D. weight and mass are the same.

(iv) Draw a labelled diagram of the magnetic field created by two N-poles placed close to each other.

(v) What is the difference between

(a) A ray and a beam of light?

(b) Umbra and penumbra?

4. (i) Find, by drawing or calculation, the resultant of two forces, 5.0N each, acting at a point at an angle of 90° with each other.

(ii) Name the three particles of an atom and state their charges.

(iii) Define the following terms:

(a) Latent heat

(b) Boiling point of a liquid

(iv) A boy weighing 55 kg finds that he can run up a flight of 15 steps, each 0.15 m high, in 5.5 s. What is his power?

(v) Name the four (4) types of machines.

## SECTION B

5. (a) State the Principle of Flotation

(b) A lump of brass weighs 0.45N in air, 0.39N in water and 0.41N in a certain oil.

Find the specific gravity of the oil.

(The density of water is 1000 kg/m$^3$).

6. (a) Define the "Principal focus of a convex mirror".

(b) A concave mirror was used to form an image of an object pin. With the help of a diagram, show where the object pin must have been placed to obtain,

(i) an upright, enlarged image

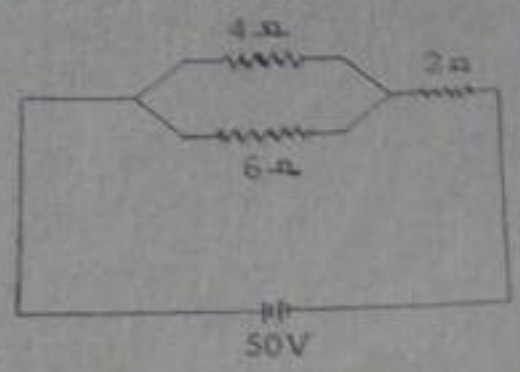
(ii) an inverted enlarged image.

C. the mass of an object

D. weight and mass are the same.

(NB: The diagrams must show at least two rays from a point on the object, not on the axis).

7.




Use the above diagram to find the following:

(a) the effective single resistance of the parallel group

(b) the total resistance

(c) the current passing through the resistor 2Ω.

8. (a) Explain why one feels cold when one puts one's barefoot on the floor but feels warm when one puts it on a carpet.

(b) Mention two important applications of expansion.

(c) Calculate the heat given out when 6 kg of water cools from 70°C to 10°C.
(Specific heat capacity of water: 4200 J/kg K).

9. (a) State the laws of Electromagnetic Induction.

(b) A step-up transformer has 1500 turns in the primary coil and 4500 turns in the secondary coil. If a voltage of 250 volts is fed in the primary coil, what will be the voltage in the secondary coil?