

OPENER EXAMINATION: TERM 1 2024
FORM TWO PHYSICS

MARKING SCHEME

1. Define physics (1 mks)

Physics is the study of matter and its relation to energy.

2. The following are branches of physics. Explain what each one of the deals with.

a. Mechanics

Mechanics involves study of motion of bodies under the influence of forces.

c. Geometrical optics

(1 mks)

Geometrical optics is the behaviour of light as it trasverses various media.

3. State 3 laboratory rules a student should follow to avoid electrical shocks.

(3 mks)

Handle electrical apparatus with dry hands

- Never plug in foreign objects into electrical sockets.

- Ensure that all electrical switches are turned off when not in use.

4. State the first aid measure for the cases. When an acid burns a hand

(1mks)

Run cold water fast over the hand.

5.a) Differentiate between basic physical quantities and derived quantities.

(2 mks)

Basic physical quantities can not be obtained from any other physical quantities but derived quantities
Are obtained by multiplying or dividing basic physical quantities.

b) Give **two** examples of derived quantities .

(2mks)

Area, volume, density.

d. Fill in the table below.

(3mks)

Basic physical quantity	S.I. Unit	Symbol of unit
Electric current	ampere (A)	
Luminous intensity	candela (Cd)	
Time	seconds (S)	

6. Determine the density in kg/m^3 of a solid whose mass is 1080g and whose dimensions in cm are length=3,width= 4 and height= 3 .

(3 mks)

$$\text{density} = \frac{m}{V} = \frac{1080}{(3 \times 4 \times 3)} = \frac{1080}{36} = 30 \text{g/cm}^3$$

7. State any two career opportunities in

physics

(2mks)

engineering and technology(laboratory technology, mapping and surveying, civil ,mechanical, instrumentation technology, meterology, electronics and telecommunication .architerure,aerivative,teaching, medical sports optician.

8. Name any 2 items contained in the first Aid kit found in the laboratory

(2mks)

Gloves, forceps, safety pins, mild antiseptic solution sterilized cotton wool and gauze. An assortment of bandages, pair of blunt ended scissors. (Any 4)

10. Describe the method you would use to measure the circumference of a cylinder using a thread and a meter

rule (3 mks)

Tie a thread on the cylinder. Count the number of turns, measure the length of the thread using the metre rule. Divide the length by the number of turns.

11. a) Define force and state its SI Units

(2 mks)

A pull or a push of a body

Newton

b) State 3 effects of force on a body.

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Makes a stationary body start moving

- Slow down or stop a moving body
- Change direction of a moving body
- Change shape of a body.

c) State 2 ways of reducing surface tension in liquid. (2 mks)

reducing Impurities
Increase in temperature.

d) A body weighs 120N in air and 70N when submerged in water. Calculate the upthrust acting on the body. (3 mks)

$120 - 70 = 50N$

e) Give a reason why weight of a body varies from one place to another. (1 mk)

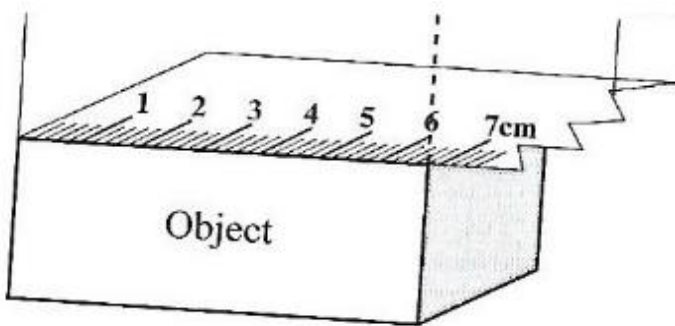
Acceleration due to gravity changes from place to place away from the earth.

12. Sketch a diagram to show the direction and magnitude of the resultant force for two forces acting as shown in figure 5 below
(1mk)

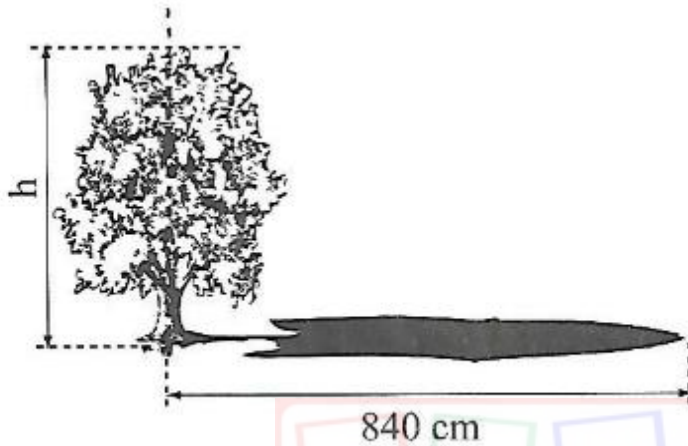
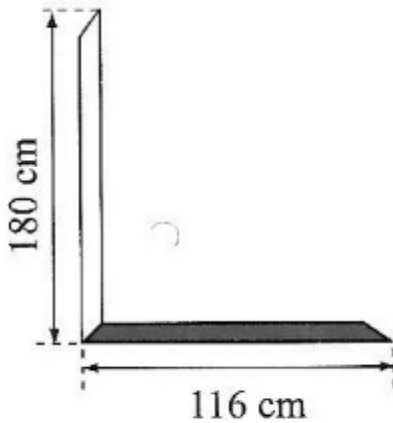


13. Study the diagram bellow and indicate on the diagram the right position of the eye when taking the measurements. record the right reading.

6.8cm A (correct position)



14. Estimate the height of the tree in the diagram below.



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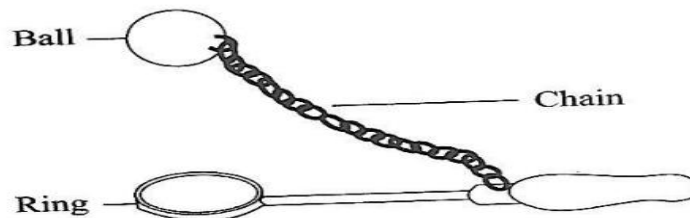
$$h = 180/116 \times 840$$

$$= 1303.44\text{cm}$$

15. Distinguish between heat and temperature. (2mks)

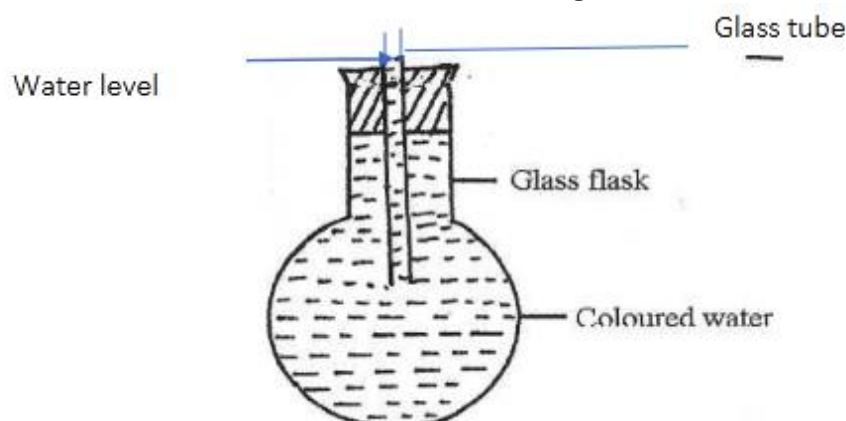
*Heat is a form of energy which passes from a body at a higher temp to a body at a lower temp.
Temperature is the degree of hotness and coldness of a body on some chosen scale.*

16. The diagram below shows a ball and ring apparatus used in an experiment, the ball goes through the rings at room temperature. When it is heated it does not go through the ring, but when left on the ring for some time, it goes through. Explain this observation



When heated, the ball expands so that it cannot go through the ring. When left on the ring for some time, the temp of the ball decreases and contracts. At the same time the temp of ring increases and it expands so that the ball goes through.

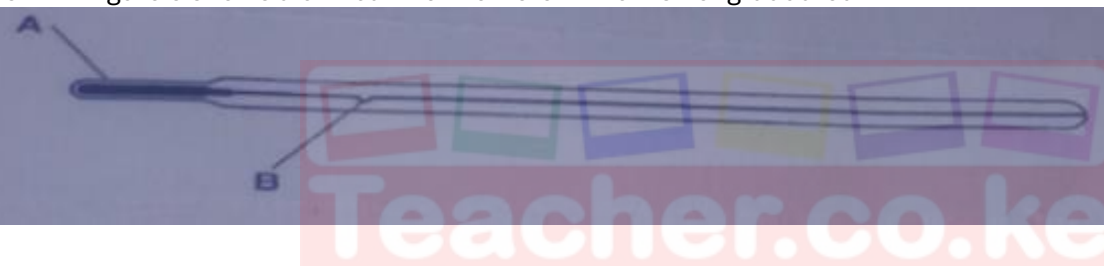
17. The figure 3 below shows a flask filled with coloured water. The rubber cork is pushed in until water rises a short distance in the glass tube.



State and explain what is observed when the flask is placed in a hot water bath (2mks)

Water level in the glass tube decreases at first due to expansion of the glass tube that gets heated first. water level starts to rise due to expansion of water when the heat finally reaches it.

18. Figure 8 shows a clinical thermometer which is not graduated



- a) Name the parts indicate with letters: A and B (2mks)

A *Bulb*

B *Constriction*

- b) Mark the appropriate scale range in degrees Celsius (2mks)

19. When a negatively charged rod is brought near the cap of a leaf electroscope, the leaf rises.

Explain this observation, **(2mks)**

Electrons are repelled to the plate and the leaf, making the leaf to diverge.

20. Why is topping of an accumulator done with distilled water? (1mk)

To maintain the relative density of the electrolyte.

- B) Name two advantages which a lead accumulator has over a dry cell (2mks)

1. they are rechargeable.

2. they are long lasting.

SECTION 2

50marks

20.. a) Forms focussed image on the film of objects both from far and near the camera.

b). Rectilinear propagation of light.

c). Luminous sources produce their own light.

Non luminous sources. Do not produce their own light but reflect light from luminous sources.

c) Angle of reflection = angle of incidence

$$= 90^\circ - 20^\circ$$

$$= 60^\circ$$

21. a) **Pressure applied at one point in an enclosed liquid is equally transmitted to all other parts of the liquid.**

b) i) $P = F/A$

$$= 60 / 0.03$$

$$= 2000 \text{ Pa}$$

ii) Pressure at A = pressure at B

$$= 2000 \text{ Pa}$$

iii) $P \text{ at B} = \text{max load} / \text{area of B}$

$$\text{Max load} = 2000 \times 0.5$$

$$= 1000 \text{ N.}$$

iv) Oil do not corrode parts of the machine.

C). i) $P = 0,25 \times 1000 \times 10$

$$= 2500 \text{ Pa}$$

ii) $P \text{ at A} = P \text{ at B}$

$$= 2500 \text{ Pa.}$$

iii) Density of liquid = $2500 / 0.2 \times 10$

$$= 1250 \text{ kg/m}^3$$

22.a) i). Density is mass per unit volume.

$$\begin{aligned} \text{ii). } 5\text{g/cm}^3 &= 5 \times 1000 \\ &= 5000\text{kg/m}^3. \end{aligned}$$

b).i). mass of water = 40 – 20

$$= 20\text{g}.$$

ii). Volume of bottle = vol of water.

$$= 20 \times 1$$

$$= 20\text{cm}^3.$$

iii). Density of liquid = $(220 - 20 / 40 - 20) \times 1$

$$= 10\text{g/cm}^3.$$

23.a) i). – expand and contract uniformly

-- seen easily.

--- not stick to the inside of the tube. (should not wet glass)

--- have wide range of temp.

ii). I). 0K = -273°C

II). 40°C = 313K

b). 1. Temp difference.

2.length.

3. crosssectional area.

b.i) T_s

ii) Dull surfaces are good absorbers of heat, polished surfaces are not good absorbers of radiant heat. They reflect radiant heat. therefore water in tin B receives less heat than water in tin A hence the lower recording of temp.

d) i). conduction and evaporation.

ii). B----- vacuum

C ----silvered wall.

iii). Conduction and convection requires material medium . B being a vacuum reduces heat transfer by this 2 modes of heat transfer.

26. a). Matter is anything that occupies space and have mass.

b). Solids----- particles compact

Gases-----particles far apart.

c). i). Brownian motion.

ii) Focus light on the smoke cell.

iii). Bright specks in continuous random motion are seen .

iv). The bright specks are particles of smoke which scatter light shining on them and so appear as bright points. They move in continuous random motion adue to continuous bombardmentby invisible particles in air.

