URANGA PHYSICS EXAMINATION

Kenya Certificate of Secondary Education

232 FORM 3 PHYSICS

(Theory)

4TH EDITION (DEC. 2021, TERM 2) – TIME 2 Hours

Name: ……..……..…Adm No……...……Class…….…

School: ……..……... Student's

Signature……Date: ……

Instructions to candidates

a) Write your **name, admission number, class** and **school** in the spaces provided above.
b) **Sign** and **Write** the date of Examination in the spaces provided above.
c) This paper consists of **two** sections; **A** and **B.**
d) Answer **all** the questions in section **A** and **B** in the spaces provided.
e) All working **must** be clearly shown.
f) **Silent non-programmable** electronic calculators may be used.
g) Students should answer the questions in **English**.

FOR EXAMINERS USE ONLY

SECTION	QUESTIONS	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-13	25	
B	14	11	
	15	12	
	16	11	
	17	10	
	18	11	
TOTAL SCORE		**80**	

This paper consists of 13 printed pages. Students should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A (25 MARKS)

(Answer all the questions in this section)

1. State **one** use of charged gold leaf electroscope. (1 mark)

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2. Explain why steel is selected as better material for reinforcement for a concrete beam. (1 mark)

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3. Name the two necessary conditions for a body to be in equilibrium. (2 marks)

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4. **Figure 1** shows apparatus used to observe the behavior of smoke particles in air.

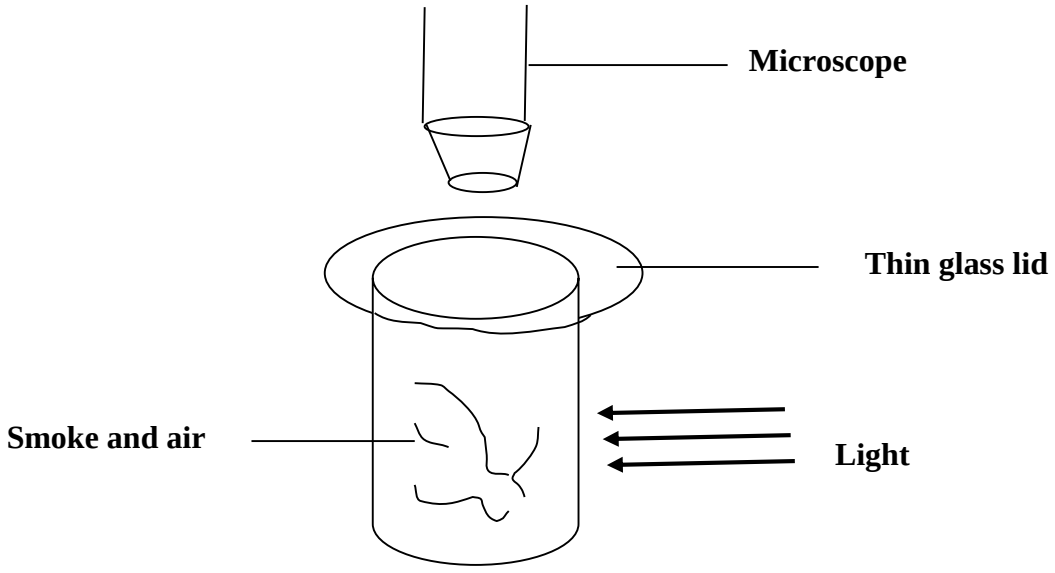

Fig. 1

Why are smoke particles suitable for use in this experiment? (1 mark)

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5. Kiss FM broadcasts at a frequency of 100Hz. If the velocity of the radio waves is $3.0x10^8$ m/s, Calculate the wavelength of radio waves. (2 marks)

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6. Name two measurements that should be taken for one to decide whether a Lead Acid accumulator is due for charging. (2 marks)

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7. On the axes provided below, sketch the velocity-time graph of a body moving down a viscous fluid. (1 mark)

8. State Newton's second law of motion. (1 mark)

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9. **Figure 2** shows a metal plate 2m long 1m wide and negligible thickness. A horizontal force of 50N applied at point 'A' just makes the plate tilt.

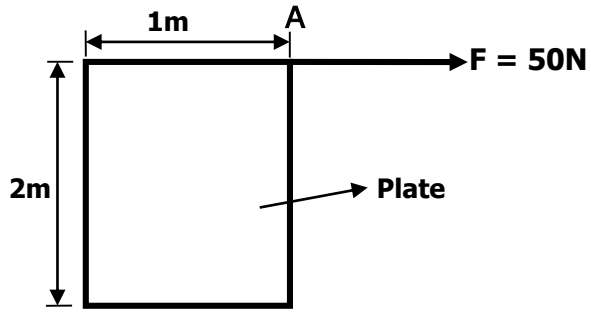

Fig.2

Calculate the weight of the plate. (3 marks)

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10. A body of mass **M** moving at a velocity ***u*** on a horizontal surface stops after moving a distance ***s***, if it attains a velocity ***v*** after ***t*** seconds. Show that $s=ut+\frac{1}{2}at^2$ where ***a*** is its acceleration.

(3 marks)

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11.

(a) State Snell's Law. (1 mark)

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(b) Give two conditions necessary for total internal reflection to occur. (2 marks)

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12. A car of mass 1,200kg moving at 90 km/h is brought to rest over a distance of 20m. Calculate the breaking force. (3 marks)

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13. Curtain on the doors and windows are seen to bulge or hang outwards from a room when there is a wind blowing across them. Explain this phenomenon. (2 marks)

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SECTION B

(Answer all the questions in this section)

14.

(a) Using the pulley system shown in **figure 3**, a mass of 10kg is raised through 2m using a force of 80N.

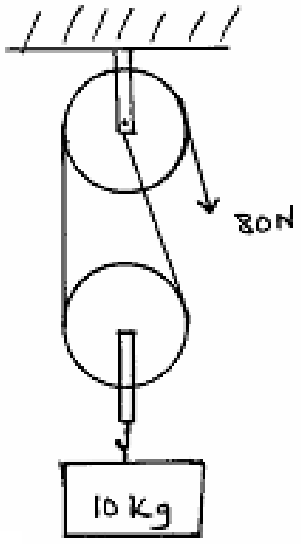

Fig. 3

Calculate;

(i) Mechanical advantage. (2 marks)

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(ii) Velocity ratio. (1 mark)

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(iii) Efficiency. (2 marks)

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(iv) Distance moved by the effort. (2 marks)

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(v) Suggest two reasons why efficiency of a machine is never 100% (2 marks)

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(b) Sometimes work is not done even if there is an applied force. Give two situations when this can happen. (2 marks)

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15.

a) State one difference between:

(i) Mechanical and electromagnetic waves. (1 mark)

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(ii) Stationary waves and progressive waves. (1 mark)

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b) Briefly describe how sound is propagated in air. (1 mark)

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c) **Figure 4** shows a set up by a student.

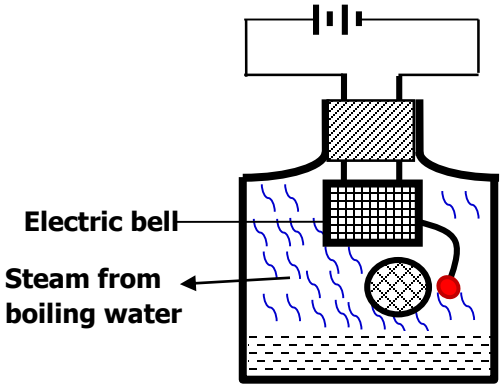

Fig. 4

(i) State what happens to the sound from the bell as the bottle and its contents are cooled to 0^oC. (1 mark)

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(ii) Explain the observation you have stated in (i) above. (2 marks)

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d) A boy standing in level ground between two high walls claps his hands. He hears an echo from one wall after 0.7s and from the other wall 0.2s later. Determine the distance between the two walls. (Speed of sound in air v=330ms^{-1} (4 marks)

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e) State two factors that affect the speed of the sound in air. (2 marks)

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16.

(a) State Ohms Law. (1 mark)

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(b) **Figure 5** shows a series – parallel circuit.

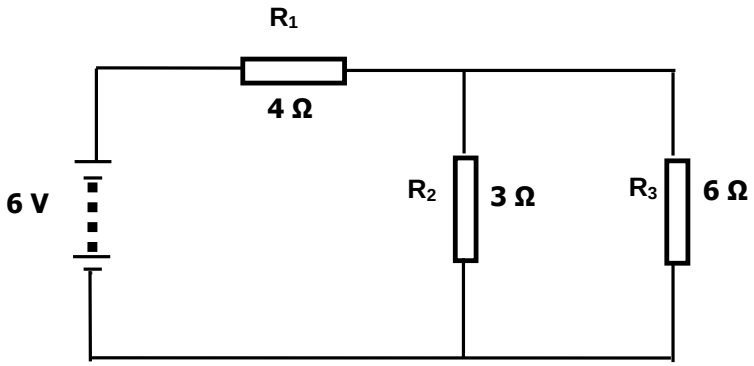

Fig.5

Calculate;

(i) Total resistance of the circuit. (3 marks)

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(ii) Total current flowing in the circuit. (2 marks)

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(iii) Voltage drop across R_1 (2 marks)

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(iv) Current through the 3Ω resistor. (3 marks)

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17.

(a) Increase in temperature weakens or destroys magnetism of a magnet. Explain. (2 marks)

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(b) **Figure 6** shows part of a motor.

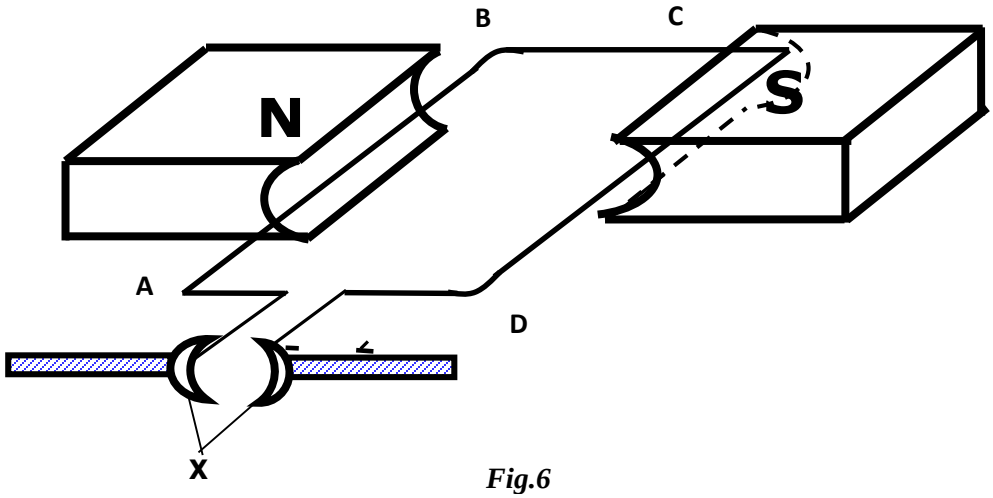

Fig.6

(i) Name the part labelled **X**. (1 mark)

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(ii) Suggest two ways in which the motor could be made to go faster. (2 marks)

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(iii) Explain how the motor works. (3 marks)

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(iv) Give **two** applications of soft magnetic materials. (2 marks)

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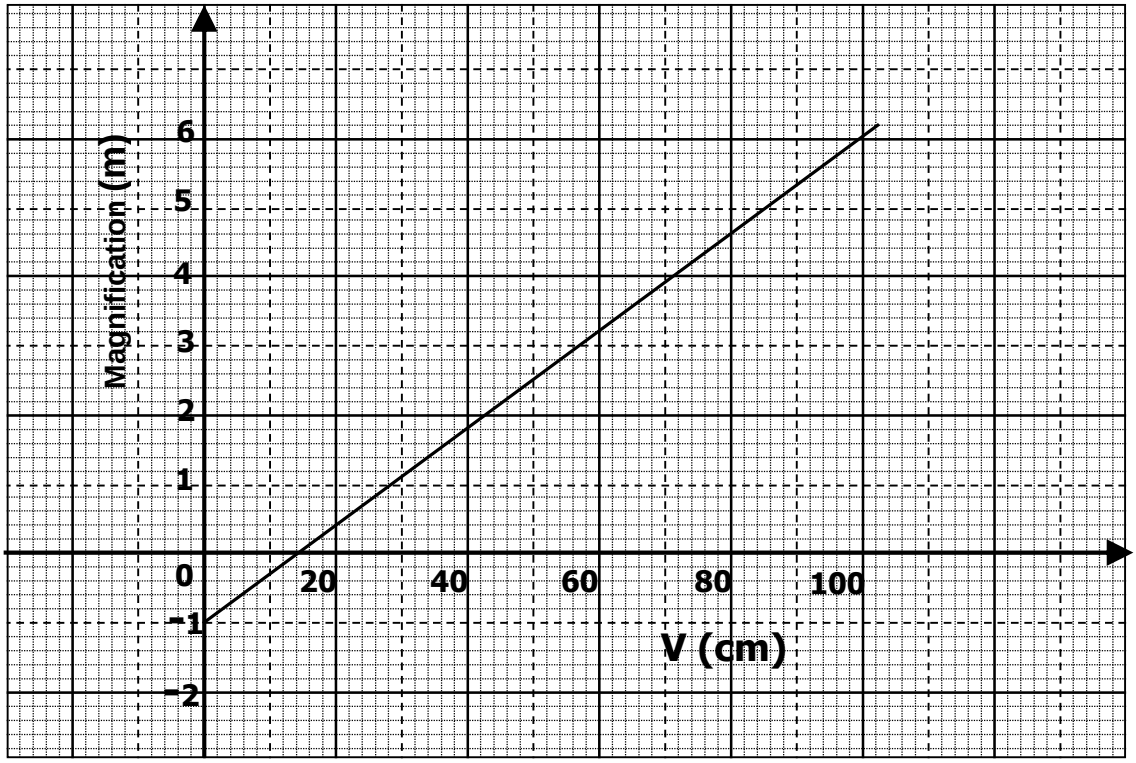
18. The graph below shows the relationship between magnifications of the image against image distance of a concave mirror. Use the information on the graph to answer questions that follow.



a)

(i) Given the formula $M = \frac{v}{f} - 1$, find the slope of the graph and hence the local length **f** of the mirror. (4 marks)

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(ii) Determine the object distance when M=1.5 (3 marks)

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b) Give two reasons why convex mirror are preferred as driving mirrors. (2 marks)

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c) State and explain the effect of enlarging the pinhole in a pinhole camera. (2 marks)

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