Name..... Index No.....

School..... Candidate's sign.....

Date.....

232/2

PRE-MOCK

Kenya Certificate of Secondary Kenya Certificate of Secondary Education (K.C.S.E)

PHYSICS
PAPER 2
2018
Time: 2 Hours

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the spaces provided
2. Sign and write the date of examination in the spaces provided
3. This paper consists of TWO sections A and B
4. Answer ALL questions in the spaces provided
5. Mathematical table and electronic calculators may be used.
6. ALL working MUST be shown clearly where necessary

FOR EXAMINERS USE

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORES
A	1 – 11	25	
B	12	10	
	13	12	
	14	08	
	15	08	
	16	13	
	17	06	
	TOTAL	80	

This paper consists of 9 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing

SECTION A (25 MARKS)

Answer all the questions in the spaces provided

1. The graphs in **figure 1** are for two magnetic materials. Use them to answer the questions that follow.

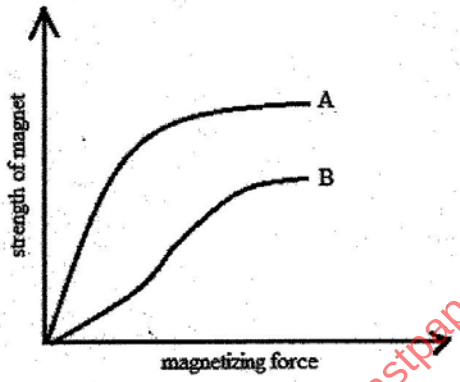

Fig. 1

i) State the material that is hard to magnetize (1mk)

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ii) Which of the two materials will be suitable for making a magnet of microphone (1mk)

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2. An optician's test card is fixed 70 cm behind the eyes of a patient who looks into a plane mirror as shown in **figure 2**.

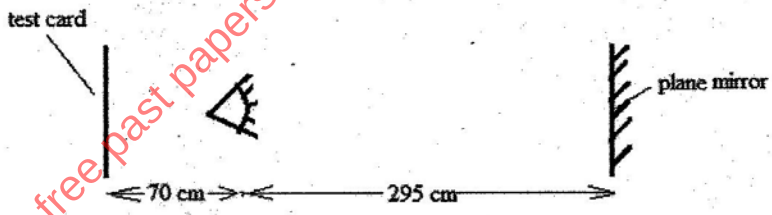

Fig. 2

Determine the distance between the eye and the image (3mks)

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3. Why does ordinary zinc react with dilute sulphuric acid in a simple cell (1mk)

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4. A ray of light is incident on a plane surface of a transparent material at such an angle that the reflected and the refracted rays are at right angles to each other. Calculate the refractive index if the angle of incidence is 60°. (3mks)

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5. Wires leading to a 12 V, 36 W headlamp bulb have a resistance of 0.25 Ω. Calculate the correct battery voltage required so that the bulb works under proper condition (3mks)

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6. State whether the following waves are transverse or longitudinal and progressive and stationery;
   i) Vibrations of an air column in a long test tube (1mk)

   .....

   ii) A ripple on a swimming pool (1mk)

   .....

7. **Figure 3** shows charge a negatively charged rod placed close to two uncharged cans placed on insulated stands and touching. On the space provided show charge distribution on each of the cans when the rod is held in position while can B is detached from A (2mks)

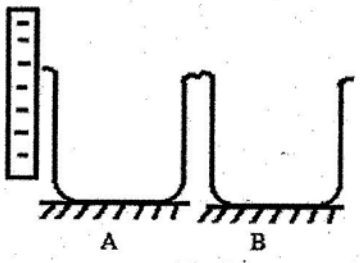

Fig. 3

8. Convex mirrors are very convenient for use as car driving mirrors. State two reasons for this (2mks)

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9. Using symbols ⊗ and/or ⊙ sketch the magnetic field due to the same current flowing through two long straight parallel wires when the directions of the current are the same (2mks)

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10. i) Write a mathematical expression to show the relationship between capacitance, voltage and charge (1mk)

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ii) A 2 μF capacitor is charged to a potential of 250 V and then disconnected from the power supply. Determine the charge on each capacitor. (2mks)

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11. An electric kettle rated 2.5 kW, 240 V is filled with water that requires 7.2×10^5 J of energy to boil it from the room temperature. Determine the time taken to heat the water (2mks)

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SECTION B (55 MARKS)

12. **Figure 4** shows a ray of sunlight incident upon a triangular glass prism, such that a spectrum is produced on the screen.

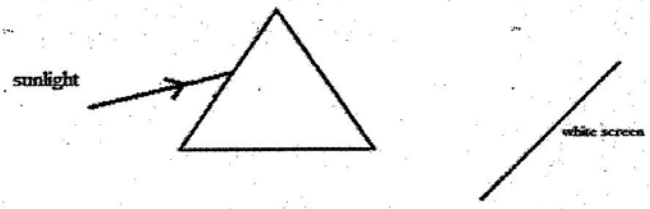

Fig. 4

a) Complete the ray to show how the spectrum is formed on the white screen and mark the violet end of the spectrum and the red end (3mks)

b) By use of a diagram explain how a concave a mirror can be used in reconstituting the spectrum above into white light (1mk)

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c) The glass prism transmits both ultra violet and some infra-red radiation. On the diagram provided mark with X the region on the screen where ultra-violet radiation can be detected and with Y the region at which you would detect infra-red radiation (1mk)

d) On the grid provided, sketch a graph to show how frequency of a radiation relates with its wavelength (1mk)

e) State how the frequencies of ultra-violet and infra-red radiation relate (1mk)

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f) State one method that can be used to detect the presence of infra-red radiation (1mk)

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g) State two applications of ultraviolet radiation (2mks)

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13. You are provided with two converging lenses of focal lengths 10 cm and 50 cm.

a) What is the meaning of dioptre (1mk)

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b) Determine the number of diptres for each of the lenses (2mks)

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c) Using ray diagrams show how you would use the two lenses to enlarge the image of an ant (4mks)

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d) Determine the total magnification of the above setup in (c) above (3mks)

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e) Which instrument is represented by the above set of ray diagram in (c) above. Explain (2mks)

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14. Figure 5 shows two parallel metal plates X and Y held vertically by two insulated blocks. X is earthed while Y is connected to the negative terminal of a battery. A light sphere P coated with aluminium foil is suspended from an iron bar by a nylon thread as shown.

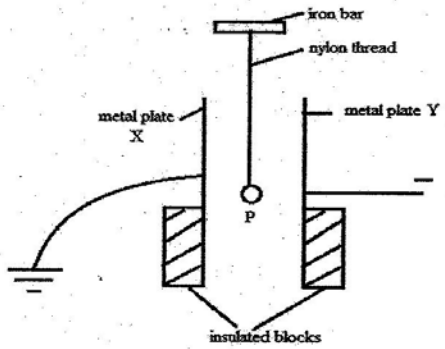

Fig. 5

a) When the sphere P is made to touch the plate Y and then released, it oscillates to and fro touching the plates.

i) State what is observed when when sphere P touches plate Y (1mk)

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ii) State the observation made when sphere P touches plate X during the oscillation (1mk)

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b) After a few oscillations, the connection between plate X and earth is cut off.

i) What happens to the oscillations of the sphere P? (1mk)

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ii) Give reasons for your answer in (b) (i) (2mks)

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c) Why must the sphere be suspended by a nylon thread and not by a thin wire? (1mk)

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d) The plate X is then earthed again and the sphere P is removed. A candle flame is now placed between plates X and Y. The power is switched on.

i) What happens to the candle flame? (1mk)

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ii) Give reasons for your answer in (d)(i) (1mk)

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15. a) Figure 6 shows a pair of U-shaped iron pieces wound with insulated wire of 15 turns and 30 turns respectively. The primary coil is connected to a p.d. of 1.0 V a.c. and has a torch bulb connected across it.

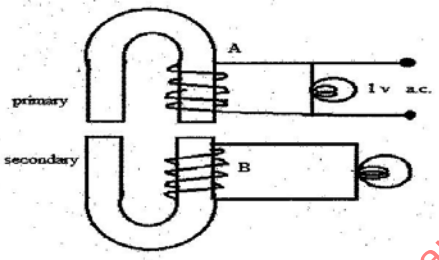

Fig. 6

i) State the observation made on the bulbs (1mk)

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ii) State a device that uses the principle described above (1mk)

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iii) Determine the reading read from an a.c. voltmeter connected across bulb B (3mks)

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b) The primary winding of a device is connected to a 240 V a.c. supply. The secondary winding is connected to a lamp. If the current flowing in the primary winding is 100 mA, calculate the power delivered to the lamp assuming that the device is 100 % efficient (3mks)

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16. I. Figure 7 shows a plan view of two speakers set up two metres apart in an open field and connected to a signal generator which makes them vibrate at 1000 Hz. Assuming the speed of sound to be 320 m/s;

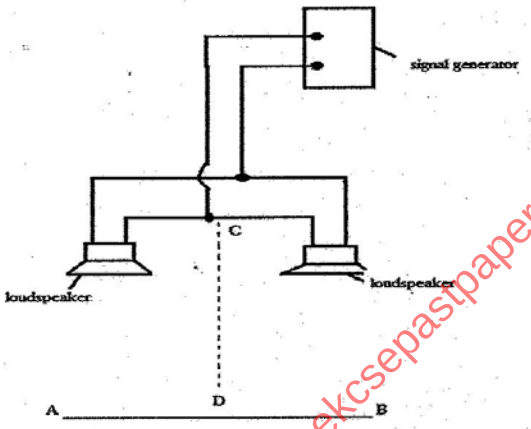

Fig. 7

a) State two conditions met by the sound waves produced from the above set up (2mks)

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b) Calculate the wavelength of the sound produced (3mks)

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i) State the observation made when one walks from A to B (1mk)

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ii) State the property of sound waves that causes the effect described in (b)(i) above (1mk)

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iii) If the frequency of the signal generator is increased to 2000 Hz, state the difference in the observation made compared to (b)(i) when one walks from A to B (1mk)

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c) State the reason why it's not advisable to carry out this experiment in a large room made of bricks (1mk)

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II. A sound wave can be termed as a mechanical wave, longitudinal wave and a pressure wave. Explain

(3mks)

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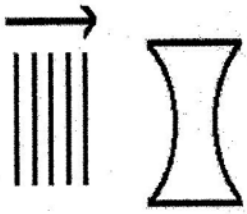
III. Complete the diagram below to show how the waves would appear after passing over the glass plates shown. (1mk)



17. i) Wires leading to a 12 V 36 W headlamp bulb have a resistance of 0.25 Ω. Calculate the correct battery voltage required so that the bulb works under proper condition (3mks)

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ii) Determine the heat generated per second in the lamp and in the wire (3mks)