GUCHA SOUTH EVALUATION TEST (GSET) 2016

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

232/2

PHYSICS

PAPER 2 (THEORY)

1. The figure 1 below shows the image I behind a mirror M

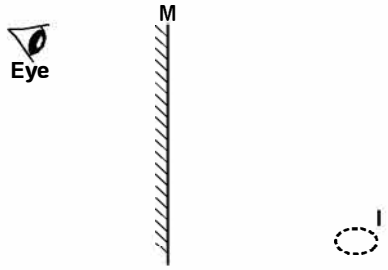


Fig 1

Using ray diagram construction, locate the position of the object. (2 marks)

2. An electromagnet is made by winding insulated copper wire on an iron core. State two changes that could be made to increase the strength of the electromagnet. (2 marks)
3. The diagram below shows an electrical appliance connected to the mains.

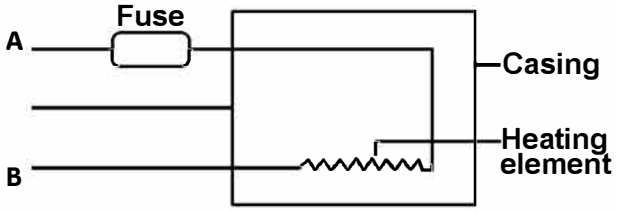


Fig 2

I. Name the colour codes for leads A and B (2 marks)

II. What is the purpose of the fuse. (1 mark)

4. State one differences between an image formed by a plane mirror and that observed through a pinhole camera. (1 mark)
5. Figure 3 shows a combination of capacitors across a power supply.

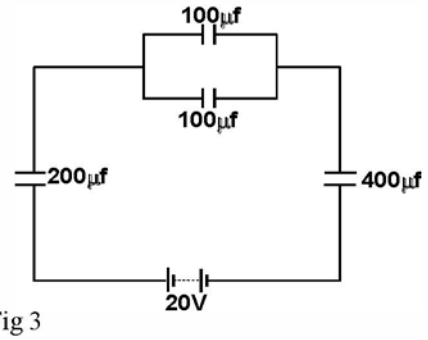


Fig 3

Determine the energy stored in the system of capacitors. (3 marks)

6. An electric bulb is rated 75W, 240V. Determine the resistance of the bulb. (2 marks)
7. Figure 4 shows how the displacement varies with time for a certain wave.

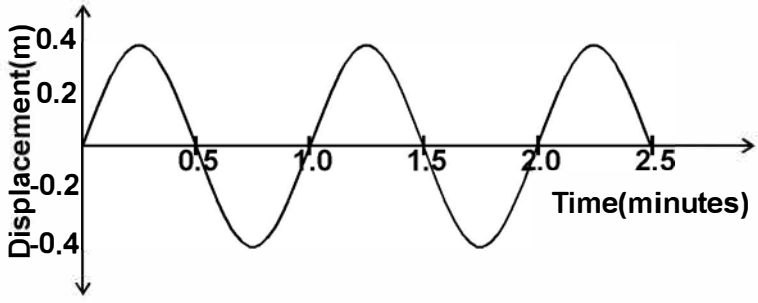


Fig 4

Determine the frequency of the wave. (2 marks)

8. In an X-rays tube it is observed that the intensity of X-rays increases when the potential difference across the filament is increased. Explain this observation. (2 marks)
9. Explain why a p-n junction diode will conduct when connected in forward bias. (1 mark)
10. Give a reason why lecture theatre halls are covered with soft perforated materials. (1 mark)

11. Figure 5 shows a magnet being moved towards a stationary solenoid. It is observed that a current flows through the circuit in a direction Q to P.

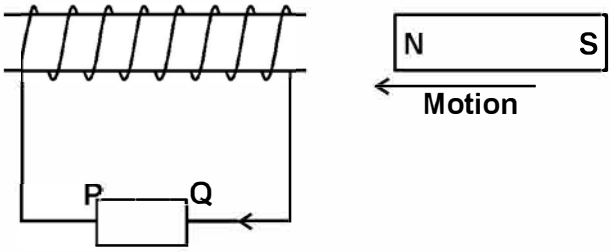


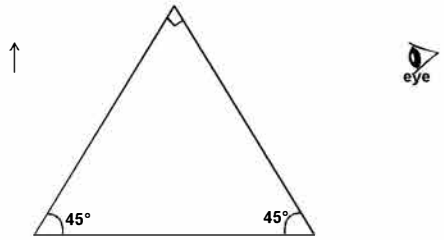
Fig 5

Explain :

(i) How the current is produced. (2 marks)

(ii) Why the current flows from Q to P. (1 mark)

12. Figure 6 shows an object placed infront of a prism as shown.



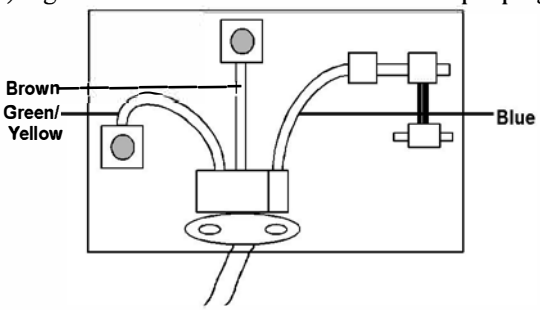
Using two rays show the image of the object as observed by an observer at E. (2 marks)

13. Table 1 below shows the radiations and their respective frequencies.

Type of radiation	Yellow light	Gamma rays	Radio waves	Micro waves
Frequency	1×10^{5}	1×10^{22}	1×10^{6}	1×10^{11}

Arrange the radiations in the order of increasing energy. (1 mark)

14. (a) Figure 7 shows a connection of the three pin plug.



(i) Identify two mistakes in this wiring. (2 marks)

(ii) What would happen if this plug was connected to the mains of the socket? (1 mark)

(iii) State two reasons why the earth pin is normally longer than the other two pins. (2 marks)

(b) A house has five rooms with 240V, 60W bulbs. If the bulbs are switched on from 7.00pm to 10.30pm

(i) Calculate the power consumed per day in kilowatt-hours. (3 marks)

(ii) Find the cost per week for lighting these rooms at Kshs 670 per unit. (2 marks)

15. (a) (i) Distinguish between threshold frequency and threshold wavelength. (1 mark)

(ii) The maximum wavelength required to cause photoelectric emission on a metal surface is 8.0×10^{-7}m. The metal surface is irradiated with light of frequency 8.5×10^{14}HZ. (Take h = 6.62×10^{-34}Js, C=3.0×10^{8}ms^{-1})

Determine

I. The threshold frequency. (2 marks)

II. Maximum kinetic energy of the electrons. (3 marks)

b) The graph below in figure 7 shows the variation of stopping potential Vs, against reciprocal of the wavelength, λ^{-1} for a certain metal. If the work function of the metal was 2.08×10^{-19} and velocity of electromagnetic wave is 3.0×10^{8} ms^{-1}

Fig. 7

The equation of the graph is given by $V_{(S)} = \frac{hc}{e\lambda} - \frac{W_O}{e}$ use the graph to determine

(i) the slope of the graph. (3 marks)

(ii) the value of the electronic charge. (4 marks)

16. (a) Distinguish between e.mf. and terminal voltage of a battery. (2 marks)

(b) The graph in figure 8 shows the variation of potential difference V against current I for a cell when current is drawn from it.

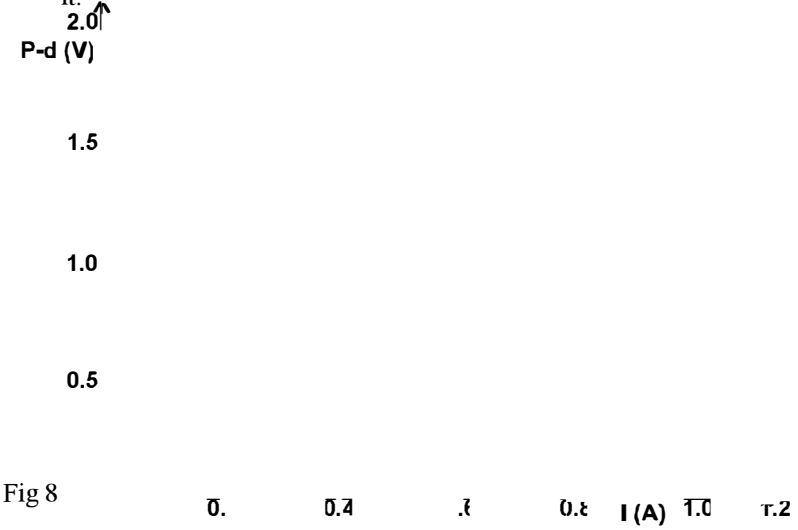


Fig 8

(i) From the graph determine

(a) The e.m.f of the cell. (2 marks)

(b) The internal resistance of the cell. (4 marks)

(c) on the space provided below, draw a circuit that could be used to obtain the results represented by the graph. (2 marks)

(d) Figure 9 shows an electric circuit. When the switch is closed the ammeter reading is 0.3A. Neglect internal resistance.

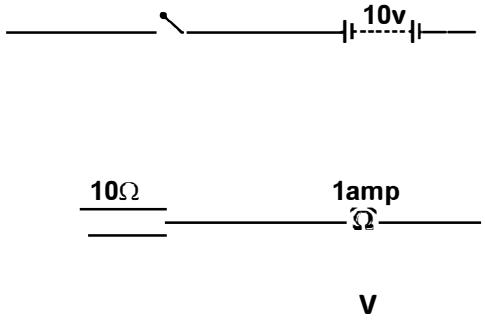
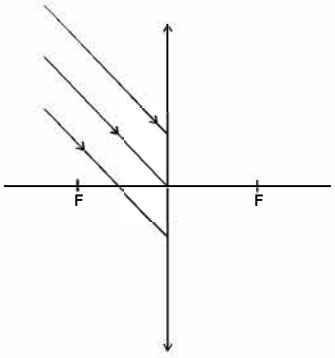


Fig 9
Determine the voltmeter reading (2 marks)

17. Figure 10 below shows parallel rays of light incident on a convex lens.



Complete the ray diagrams to show the emergent beam in each case. (2 marks)

(b)Table 2 below shows values of object distance U and corresponding value of image distance V for a convex lens.

Object distance U (cm)	10	15	20	25	30	35
Image distance V (cm)	24.6	17.1	13.3	11.8	10.9	10.4

Table 2

(i)Plot a graph of (U + V) against UV. (5 marks)

(ii) Determine the focal length of the lens. (3 marks)

(c) Give one difference between the eye and the camera. (1 mark)

18.(a)(i) State Faraday's law of electromagnetic induction. (1 mark)

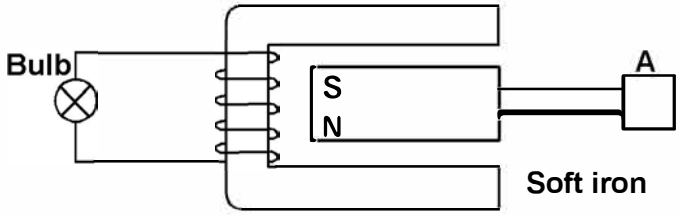
(ii) State the difference between induction coils and a step-up transformer. (1 mark)

(b) An ideal transformer steps 8.0V upto 2000V, and the 4000 turns secondary coil carries 2.0 Amps. Calculate.

(i) The number of turns in the primary coil. (2 marks)

(ii) the current in the primary coil. (2 marks)

(c) Figure 9 below shows a diagram of a bicycle dynamo. Wheel A is connected by an axle to a permanent cylindrical magnet and is rotated by the bicycle wheel.



(i) Explain why the bulb lights. (2 marks)

(ii) How would the person riding the bicycle make the bulb brighter. (1 mark)