NAME:……INDEX ……..…..DATE……..…

SCHOOL:……SIGNATURE……

232/2
PHYSICS
PAPER 2
JULY / AUGUST, 2010
2 HOURS

KISUMU NORTH AND EAST DISTRICTS JOINT TEST
Kenya Certificate of Secondary Education 2010

232/2
PHYSICS
PAPER 2
JULY / AUGUST 2010

INSTRUCTIONS TO CANDIDATES

- *Write your name and index number in the spaces provided above*
- *This paper consists of **two** sections **A** and **B***
- *Answer **all** the questions in the spaces provided*
- ***All** working **must** be clearly shown in the spaces provided*
- *Mathematical tables and electronic calculators may be used*
- *Take velocity of light* $3.0\times10^{8}\,ms^{-1}$ *and plank's constant* $h = 6.63\times10^{-34}\,Js$

For Examiner's Use Only

Section	Question	Maximum Score	Candidates' Score
A	Q1 – Q15	25	
B	Q16	14	
	Q17	13	
	Q18	15	
	Q19	13	
		80	

SECTION A (25 MARKS)

1. A plane mirror is suspended on a wall by a string shown in the diagram

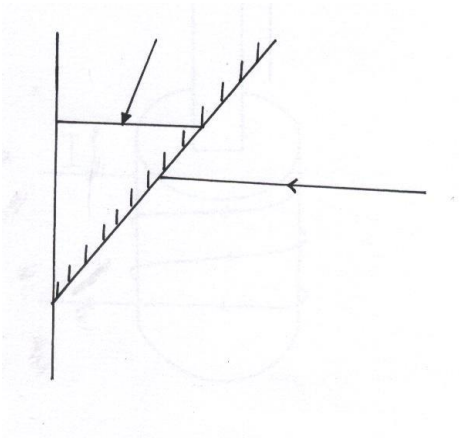

Fig 1

An incident ray then strikes the mirror at an angle of 70^0. Determine the angle formed between the incident ray and reflected ray. (2mks)

2. Give a reason why a prism disperses white light into the component colours (1mk)

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3. Fig 2 below shows a conductor y placed in a magnetic field. The conductor carries a current flowing into the paper.

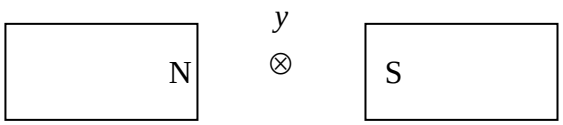

Fig 2

Sketch the resultant magnetic field between the poles of the bar-magnet (1mk)

Show on the diagram the direction of the force, F acting on the conductor (1mk)

4. Determine the largest number of 75W bulbs which can be safely used to run on a 240V source with a 5A fuse. (3mks)

5. A charge of magnitude $12\times10^{3}C$ flows through a point in 15 minutes. Calculate the current. (2mks)

6. Fig 3 below shows a 5μF and a 3μF capacitors connected to a 6V battery

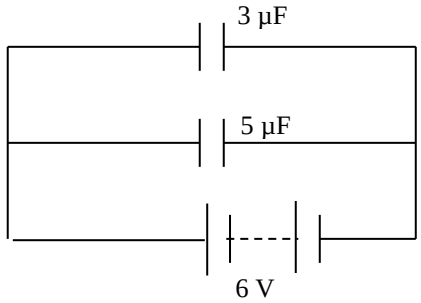

Fig 3

Calculate the charge stored in the circuit (3mks)

7. Complete the diagram below to show how diffraction would occur as the incident waves pass through the obstacle.

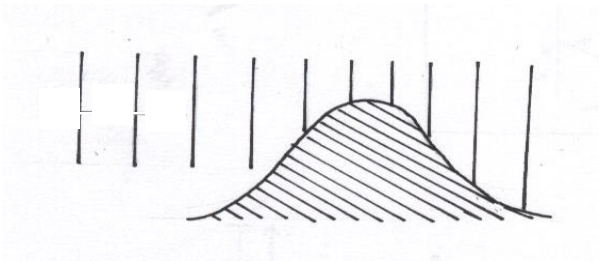

Fig 4

8. State the effect on conductivity of increasing the temperature of a semi-conductor (1mk)

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9. Arrange the following waves in the order of increasing wavelength :- X-rays, visible light, infra-red, T.V waves, micro waves (1mk)

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10. An Electric heater is rated 1000W, 240V. Calculate the resistance of this element (2mks)

11. A freely pivoted spike is charged to a high negative voltage in the air

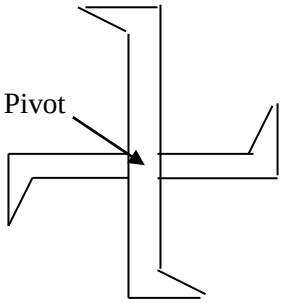

Fig 5

Explain why the spikes move (2mks)

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12. What are the values of **m** and **a** in the nuclear equation given below:- (1mk)

$$\underset{m}{a}X \rightarrow \underset{90}{230}Y + 2\propto$$

13. Give a reason why the x-ray tube is evacuated (1mk)

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14. State two ways by which energy losses are minimized in a transformer . (2mks)

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15. On the axes provided in the figure below, sketch a frequency-wavelength graph for an electro-magnetic wave. (1mk)

SECTION B (55 MARKS)

16. (a) The diagram below shows an experimental set up consisting of a mounted lens, L, a screen, S, a metre rule and a candle.

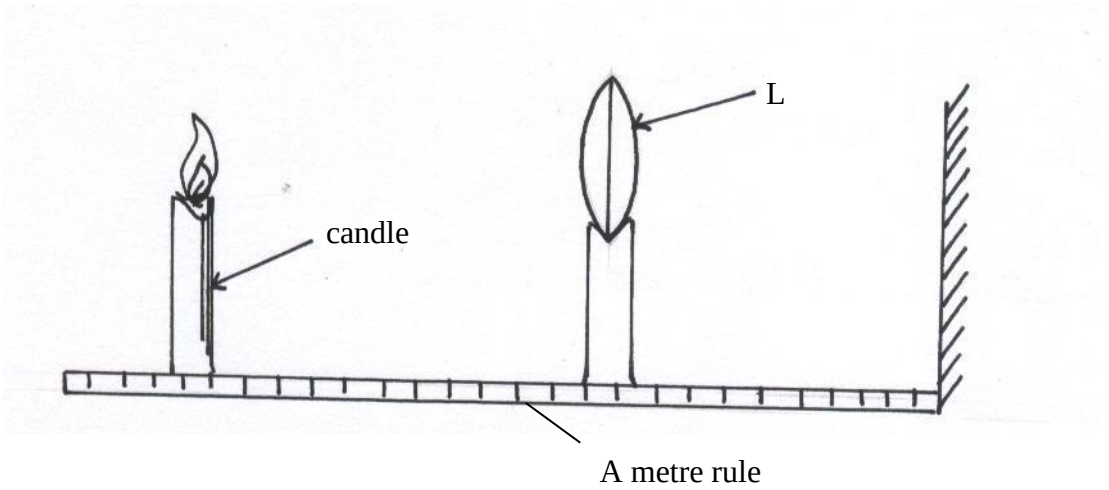

Fig 6

(i) Describe how the set-up may be used to determine the focal length, f of the lens. (5mks)

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(ii) State the reason why the set-up would not work if the lens were replaced with a diverging lens (1mk)

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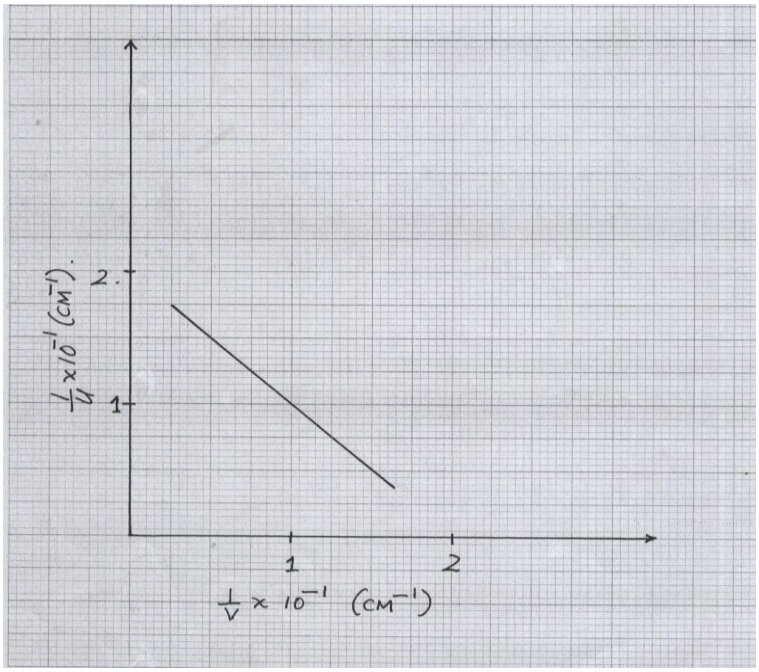
(b) The graph below shows the relationship between $\frac{1}{u}$ and $\frac{1}{v}$ for converging lens where u and v are the object and image distances respectively.



From the graph, determine the focal length, f, of the lens. (5mks)

(c) An object placed 15cm from a convex lens is magnified two times. Determine the focal length of the lens. (3mks)

17. (a) State Ohm's law (1mk)

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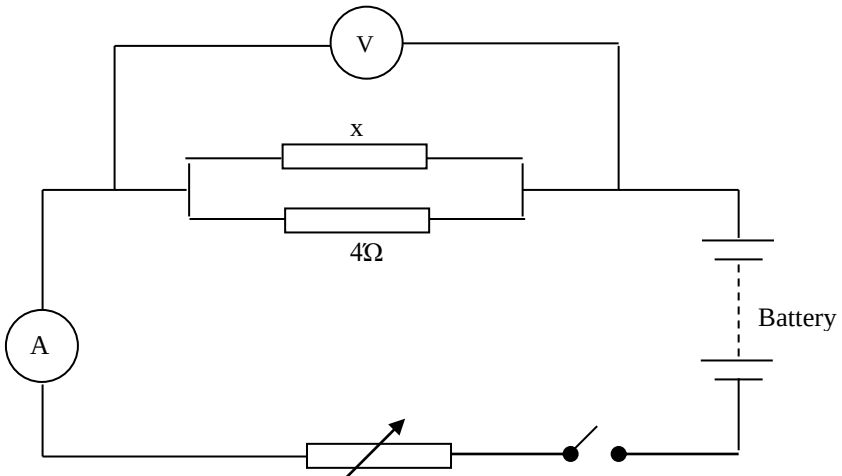
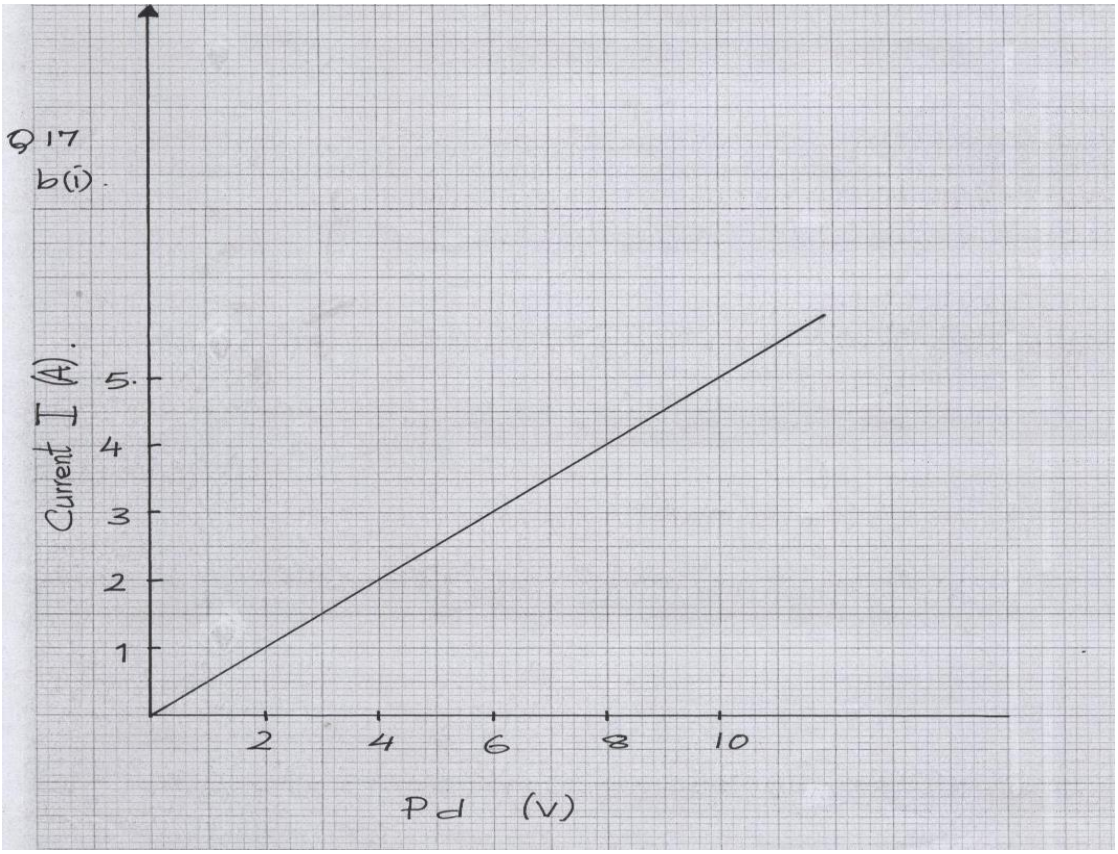
(b) Two resistors 4Ω and the other unknown resistor x are connected in a circuit as shown in the fig 7 below



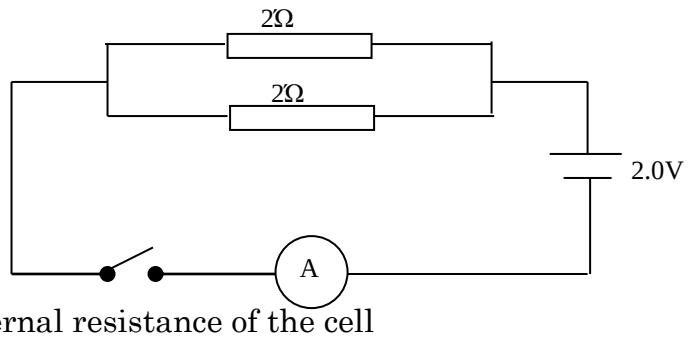
The current I passing through the combination is measured for various potential differences, A graph of p.d. against current is shown in the grid below.



(i) Use the graph to determine the total resistance of the combination. (3mks)

(ii) Determine the value of the unknown resistance x (2mks)

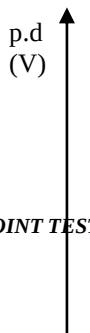
(c) The reading of the ammeter in the figure below is 0.5A when the switch is closed.



Determine the internal resistance of the cell (3mks)

(d) A battery is connected to an external resistor, R. State any two factors that determine the magnitude of the current produced in the circuit. (2mks)

(e) On the axes provided, sketch a graph to show how current, I varies with potential difference, V, across a metallic conductor that is being heated at the same time. Explain your answer (2mks)



18. (a) (i) What is meant by photo-voltaic effect? (1mk)

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(ii) You are provided with a clean Zinc plate, a leaf electroscope, a charging rod and a source of ultra-violet (U.V). Describe briefly with the aid of a diagram how photo-electric effect may be demonstrated (5mks)

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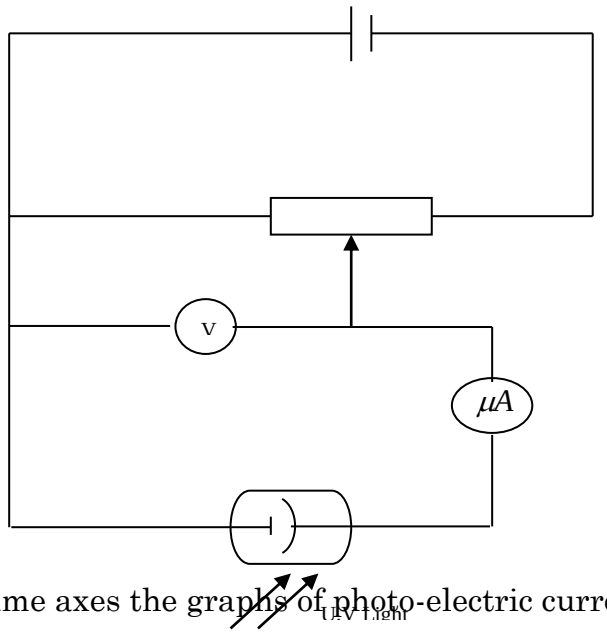
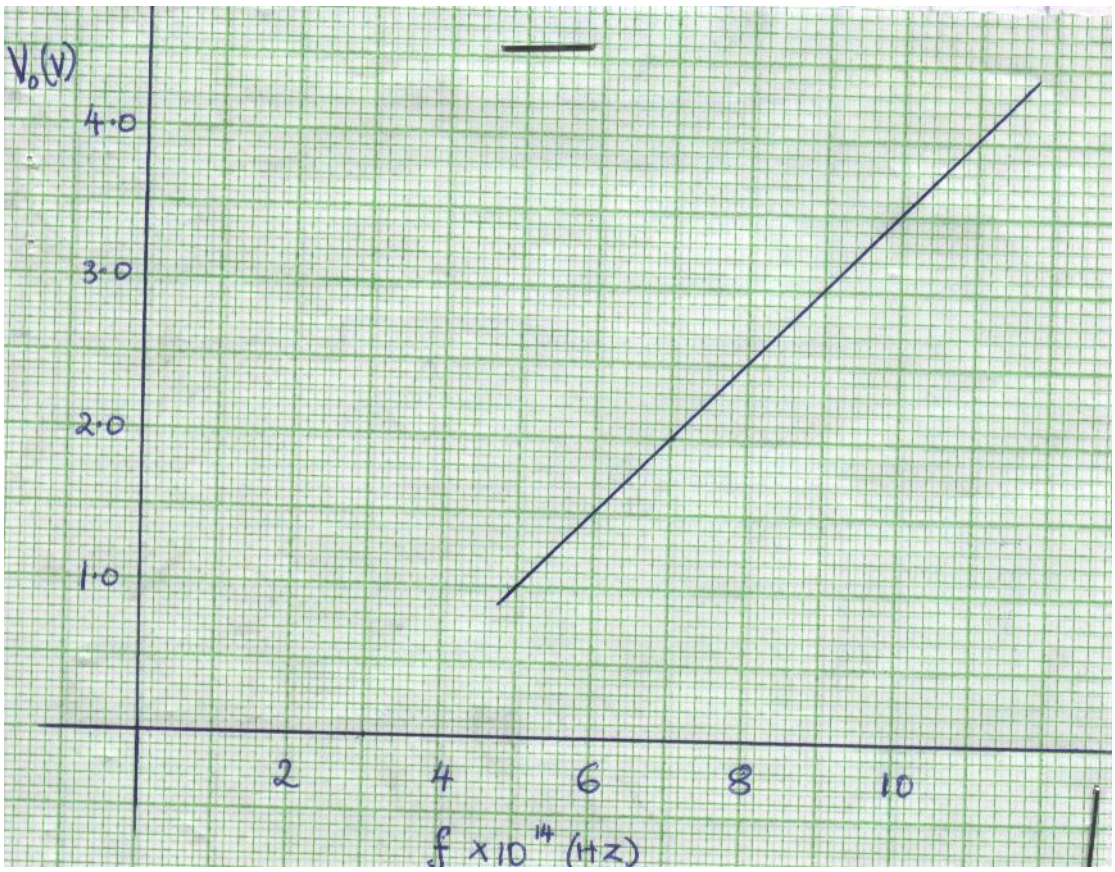
(b) The figure below shows the diagram of a setup used in an experiment to investigate photo-electricity. The frequency of the ultra-violet light was constant throughout the experiment



Sketch on the same axes the graphs of photo-electric current (y-axis) against the voltage for two different intensities A_1 and A_2 of ultra-violet where $A_1 > A_2$ (3mks)

The graph below shows the variation of stopping potential, V_0, with incident frequency, f_1 for a certain metal producing photoelectrons



(i) What is meant by stopping potential? (1mk)

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(ii) Use the graph to determine the working function of the metal (5mks)

19. (a) State Lenz's law of electo-magnetic induction (1mk)

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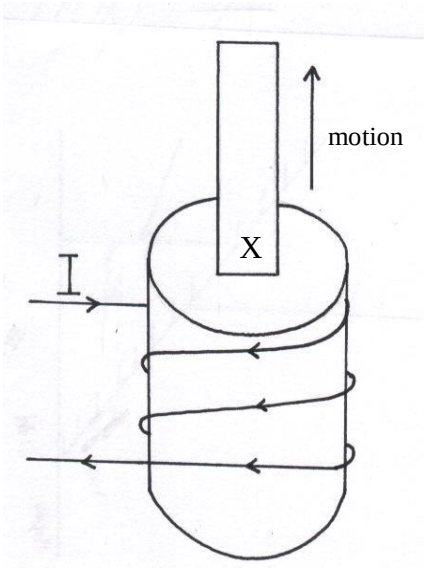
(b) In the figure below, the bar magnet is moved out of the coil



(i) If the current, I is induced in the coil in the direction shown, what is the polarity of x of the magnet? (1mk)

(ii) Explain briefly the source of electrical energy in the circuit (1mk)

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(c) A hydro-electric power station produces 500KW at a voltage of 10KV. The voltage is then stepped up to 150KV and the power is transmitted through cables of resistance 200Ω to a step down transformer in a sub-station. Assuming that both transformers are 100% efficient calculate;

(i) The current produced by the generator (2mks)

(ii) The current that flows through the transmission cables (2mks)

(iii) The voltage drop across the transmission cables (2mks)

(iv) The power loss during transmission (2mks)

(v) The power that reaches the sub-station (2mks)