**MANGU HIGH SCHOOL**

**232/2 NAME: ----------------------------------------------------**

**PHYSICS**

**PAPER 2 CLASS: --------------- Adm. No. ------------------------**

**(Theory)**

**Kenya Certificate of Secondary Education**

**MOCK EXAMINATIONS**

**JULY 2014**

**Physics**

**Paper 2**

**2 Hours**

* This paper consists of ***Two*** sections ; ***A*** and ***B***.
* Answer ***ALL*** the questions in sections ***A*** and ***B*** in the spaces provided.
* ALL working ***MUST*** be clearly shown in the spaces provided in this booklet.
* Mathematical tables and Electronic calculators may be used.
* Non programmable silent calculators and KNEC mathematical tables may be used.
* ***This paper consists of 12 printed pages***
* ***Candidates should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing***

**For Examiner’s Use Only**

|  |  |  |  |
| --- | --- | --- | --- |
| **SECTION** | **QUESTION** | **MAX. SCORE** | **CANDIDATE’S SCORE** |
| A | 1 - 10 | 25 |  |
| B | 11 | 14 |  |
|  | 12 | 12 |  |
|  | 13 | 12 |  |
|  | 14 | 10 |  |
|  | 15 | 7 |  |
|  | **TOTAL SCORE** | **80** |  |

*Turn over*

**(SECTION A 25 MARKS)**

*Answer* ***ALL*** *questions in the spaces provided after each question*

1. Polarization and local action are the major defect of a simple cell. How are they minimized? (2mks)
2. The diagram below shows a circuit diagram that was connected by a student. Comment with reason on the brightness of the identical bulbs. (1mk)

C

A B

1. State the evidence that shows that propagation of light is rectilinear. (1mk)
2. In an x-ray tube, it is observed that the intensity of x-rays increase when the p.d. across the filament is increased. Explain this observation (2mks)
3. Main’s electricity is produced and transmitted as alternating current (a.c) and not as direct current (d.c) from power stations to consumers over long distances.
4. State why a.c. is preferred to d.c. for transmission. (1mk)
5. Explain why this electricity is transmitted at very high voltages. (1mk)
6. A real image twice the size of an object is formed by a lens. If the distance between the object and the image is 45cm, determine focal length of the lens. (3mks)
7. (a) What is meant by the term “activity” of a radioactive sample. (1mk)

(b) The half life of an element ‘X’ is 24 days. Calculate the mass remaining of a sample of mass 0.64g after 84 days. (3mks)

8. A transformed uses 240V a.c. supply to deliver 9.0A at 80V to a heating coil. If 10% of the energy taken from the supply is lost in the transformer itself, what is the current in the primary winding? (3mks)

1. Figure below shows a human eye defect.

Object

Eye

Image

1. State two possible casus of this defect. (2mks)
2. What type of lens is used to correct this defect. (1mk)
3. On the space below, draw a diagram to show how this lens is used to correct this defect. (2mks)

10. What is meant by these processes

(a) Nuclear fusion (1mk)

(b) Nuclear fission (1mk)

**(SECTION B 55 MARKS)**

11. (a) Two heaters A and B are connected in parallel across a 240V supply. Heater A is rated at 2000W while B is rated at 1500W. Heater A produces 120kJ in 1 hour and B 45kJ in half an hour. Determine;

(i) The ratio of RA:RB where RA is the resistance of Aand RB is the resistance of B. (3mks)

(ii) The value of RA if RB is 1000Ω (2mks)

(iii) The amount of heat generated if two heaters are connected in series across the voltage for 4 minutes (3mks)

(b) Heater A is used in a house every day for 2 hours alongside the following devices;

* + Six 60W bulbs for 12 hours a day
	+ An electric iron rated 1500W once a day for 1½ hours
	+ A fridge rated 300W that runs throughout the day
1. How much energy in joules is consumed by household in a day.

(3mks)

1. In addition to this, the local power company has the following levies
* Standing charge = ksh 120.00
* ERC levy at 3.00 cents/kwhr
* Rep levy at 5%
* VAT 16%

Calculate the monthly cost for this household if the cost of power is 11.65per kwh (4mks)

12. (a) The figure below shows a mirror AB of height ,h, suspended infront of an object OD. An observer at O, views the image O’D’ of OD on the mirror.

Use rays to show that the maximum height of the object OD than can be viewed by observer O is 2h. (3mks)

(b) The figure below shows six students standing in front of a mirror XY at positions A,B,C,D,E and F.

1. Indicate the positions of the images of students at A,B,C,E and F (1mk)
2. State which of the five images are visible to the student standing at D. (1mk)
3. Using rays, indicate on the figure, how b(ii) above is possible. (2mks)
4. (i) A pin is placed in front of a convex mirror. A plane mirror is placed between the convex mirror and a pin so as to cover the bottom half of the convex mirror. The plane mirror is adjusted so that the image Ic by the curved mirror and the image by plane mirror Ip coincide. See figure – below.

Plane mirror

Ic

Ip

Pin

Convex mirror

If the distance between the mirrors is 12cm and the distance between the pin and plane mirror is 28cm, determine the focal length of the convex mirror. (4mks)

(ii) State the reason why a ray of light through the optical centre of a lens passes on undeviated. (1mk)

13. (a) State two factors that determine the speed of electrons emitted by a metal surface. (2mks)

(b) In an experiment using a photocell, light of varying frequency but constant intensity is made to strike the surface of a metal. The maximum K.E max. of photoelectrons for each frequency ƒ, was measured. The figure below is a graph showing how the maximum K.E. max varies with frequency ƒ.

 1.0 2.0 3.0 4.0

 Frequency (x 1015Hz)

 K.Emax (x 10-19 J

 2 4 6 8 10 11

Given that KEmax =hƒ- $∅ $is the equation of the graph where h is planks constant and q is the work function. Determine from the graph.

1. The threshold frequency ƒo. (1mk)
2. Planks constant h (3mks)
3. Work function in electron volts (ev) (3mks)
4. The figure below shows a circuit containing a battery, two identical lamps P and Q and a photoconductive cell or light dependant resistance. (L.D.R.)

LDR

Light

Q

P

1. State what is observed on the brightness of the lamp Q, if the intensity of light falling on the L.D.R. is gradually increased (1mk)
2. Explain your answers in (i) above (2mks)

14. (a) State one differences between a cathode ray oscilloscope (C.R.O) and a cathode ray tube (C.R.T.) (TV)

 (b) The figure below shows the trace on the screen of an a.c. signal connected to the y-plates of a C.R.O. with the time base on. The time base control is at 100$μs$/div and the y-gain is at 200v/div.

1. Calculate the frequency of the a.c. signal. (3mks)
2. Determine the peak to peak voltage of the input signal. (1mk)
3. Show the appearance of the signal on the same axis if the p.d. of the source is doubled and the frequency halved. (2mks)

 (c) (i) Give a reason why a C.R.O. is regarded as a very good voltmeter

 (1mk)

 (ii) Give one other use of a C.R.O other than the above. (1mk)

15. (a) You are provided with a positively charged rod. With the aid of diagrams, outline and explain the steps you would take to charge a metal leaf electroscope negatively using the rod. (3mks)

 (b) When a glass rod is brought her the cap of a negatively charged electroscope, no change is observed on the leaf. However when a metal rod is brought near the cap, the divergence drops. Explain this observation (2mks)

 (c) Give one difference and one similarity between a capacitor and a battery. (2mks)