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

School: ..... Candidate's Sign. .....

Date: .....

232/2
PHYSICS
PAPER 2
JULY /AUGUST 2013
TIME: 2 HOURS

ALLIANCE HIGH SCHOOL
(TRIAL EXAM)

Physics
Paper 2

INSTRUCTIONS TO THE CANDIDATES:

- Write your **name** and **index number** in the spaces provided above
- Sign and write the date of the examination in the spaces provided.
- This paper consists of ***two*** sections: **A** and **B.**
- Answer ***all*** questions in section **A** and **B** in the spaces provided.
- All working ***must*** be clearly shown in the spaces provided in this booklet.
- Scientific calculators and KNEC mathematical tables may be used except where stated otherwise.

For Examiner's Use Only

SECTION	QUESTION	MAXIMUM SCORE	CANDIDATE'S SCORE
A	1-12	25	
B	13	14	
	14	14	
	15	12	
	16	08	
	17	07	
	TOTAL	**80**	

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

SECTION A (25 Marks)

1. State any two uses of ultra violet rays (2 marks)

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2. Figure 2 shows two identical electroscopes. Figure 2 (a) is charged while figure 2(b) is uncharged.

Figure 2(a) **Figure 2(b)**

In the space below sketch electroscopes showing the charge distribution after the caps of the two *are* connected by a thin conducting wire. (2marks)

3. Figure 3 shows a horse shoe magnet whose poles are labeled and two other bar magnets near it. Iron nails are attracted to the lower ends of the magnets as shown.

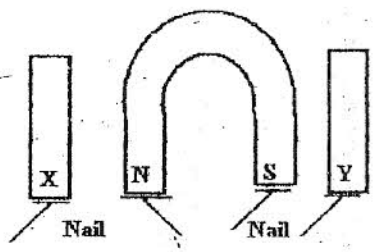

Figure 3

Identify the poles marked X and Y. (2marks)

X .....

Y.....

4 A person standing behind a wall hears a bell ringing although he cannot see the bell.

State the property of sound enables him to hear the sound. (1 mark)

.....

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5. A cell drives a current of 4.0A through a 1.2Ω resistor. When the same cell is connected to a 0.8Ω resistor, the current that flows is 3.0A. Find the emf of the cell 3 marks

1.8Ω

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6. Two capacitors of xμF and 2μF are connected in parallel and the combination joined in series to a 5μF capacitor. The effective capacitance of the network is 2.5μF. Determine the capacitance x. (3marks)

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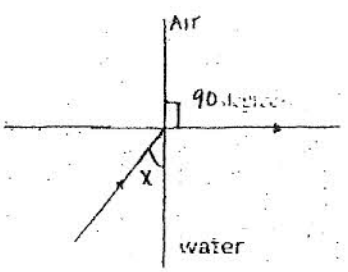
Figure 4 shows light travelling from water to air. The refractive index of water is 1.33.



n= 1.33

Figure 4

7 (a) Determine angle of incidence at the interface (3 marks)

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(b). State the name of angle x (1mark)

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8 when waves go through a narrow slit, they are diffracted. State one condition that enhances diffraction of waves through narrow slits 2 marks

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Figure 6 shows a bar magnet moving out of the solenoid inducing current in the direction shown in the coil.

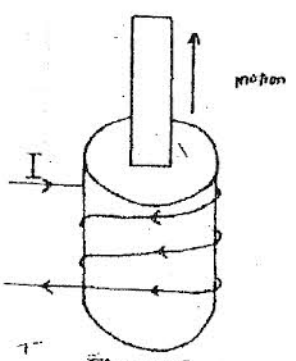

Figure 6

9 (a) State the polarity of the magnet at the end labeled X (1 mark)

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(b) Give a reason why the device in Figure 6 is a transducer. (2 marks)

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10. Figure 7 shows a galvanometer connected to a coil with a south pole of a permanent magnet approaching the coil.

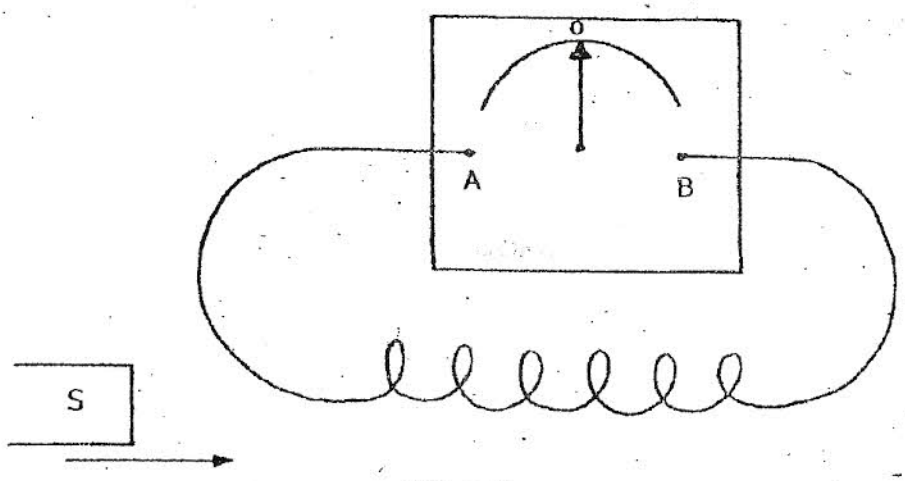


Figure 7

Indicate the direction of the pointer on the galvanometer when the bar magnet is moved as shown. (1mark)

The figure 8 shows a cathode ray beam entering a uniform magnetic field, perpendicular to the plane of the paper.

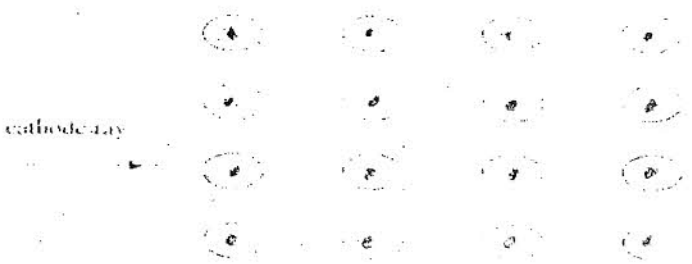
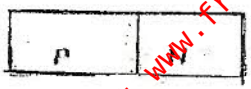


Figure 8

11. Complete the diagram to show the path of the cathode rays in the field. (1mark)

Figure 9 shows a junction diode.



12. Draw a circuit diagram showing the diode connected to a cell in a forward bias mode. (1mark)

SECTION B (55 marks)

13. (a) Explain energy loses in a transformer during self induction. (2marks)

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(b) A transformer is designed to supply a current of 8 A at a potential difference of 120V to a motor Connected to an a.c supply of 240V. Given that the efficiency of the transformer is 75%, calculate

(i) The current in the primary coil (3marks)

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(ii) The power supplied to the motor (3 marks)

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(c) Figure 10 shows a cross-section of a bicycle dynamo. The wheel is connected by an axle to a permanent cylindrical magnet and rotated by the bicycle tyre.

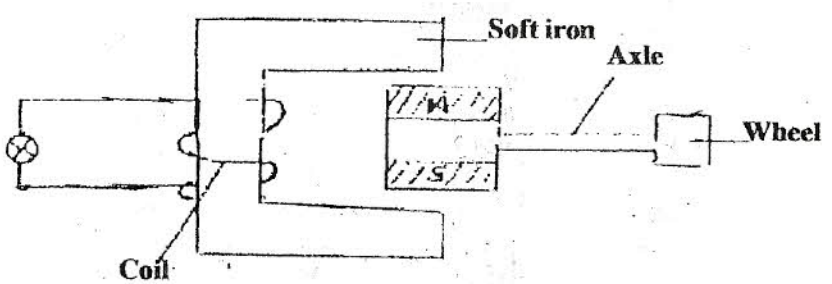

Figure 10

(i) Describe the operation of the dynamo that leads to the lighting of the bulb. (2marks)

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(ii) State TWO modifications that can be made to the dynamo to increase the brightness of the bulb (2mark)

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(iii) Explain why steel cannot replace soft iron in the structure of the dynamo in figure 12. (2 marks)

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14 (a) Define work function as used in photoelectric effect. (1 mark)

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b) State ONE application of photoelectric effect (1mark)

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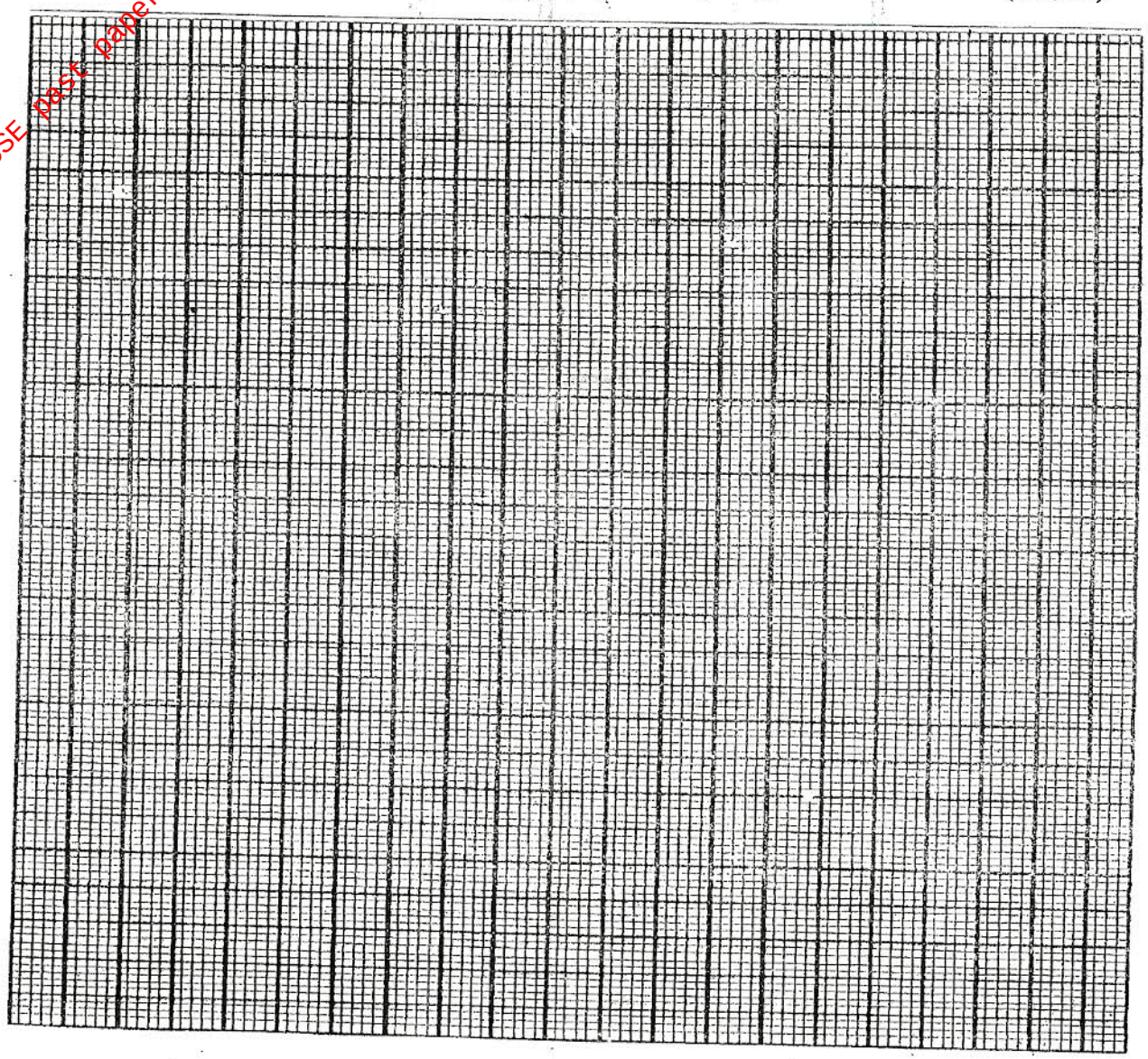
c) In an experiment to observe photoelectric emission from a clean caesium surface, the following readings were obtained.

Stopping potential (V)	0.6	1.0	1.4	1.8	2.2
Frequency ($x10^{14}$Hz)	6.0	7.0	8.0	9.0	10.0

i) Plot a graph of stopping potential V_s (y-axis) against frequency (5 marks)



ii) From the graph, determine the threshold frequency of the surface. (1 marks

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iii) Use the graph to determine plank's constant. (3 mark)

(*Charge of electron=1.602x10^{-19}C*)

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iv) Calculate the work function of the metal. (3 marks)

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15. a) You are provided with the following apparatus:

- Meter rule
- A concave mirror and holder
- A candle
- White screen

(i) Using a diagram show how these apparatus may be set up to obtain focal length of a concave mirror (2marks)

(ii) Briefly describe how this arrangement may be used to determine the focal length of the concave mirror. (5marks)

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c) Determine the position of an illuminated object from a thin converging lens of focal length 10 cm which forms a real image twice as large as the object. (3marks)

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d) Figure 11 shows a certain eye defect.

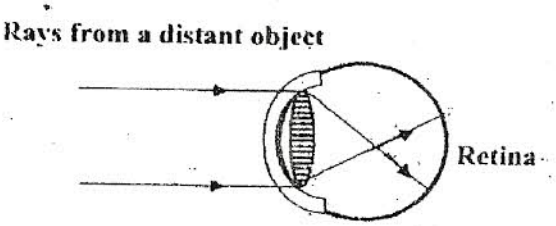

Figure 11

(i)Name the eye defect. (1 mark)

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On the same diagram, draw an arrangement to show how the defect can be corrected. (1mark)

16. (a)Define radioactive decay (1mark)

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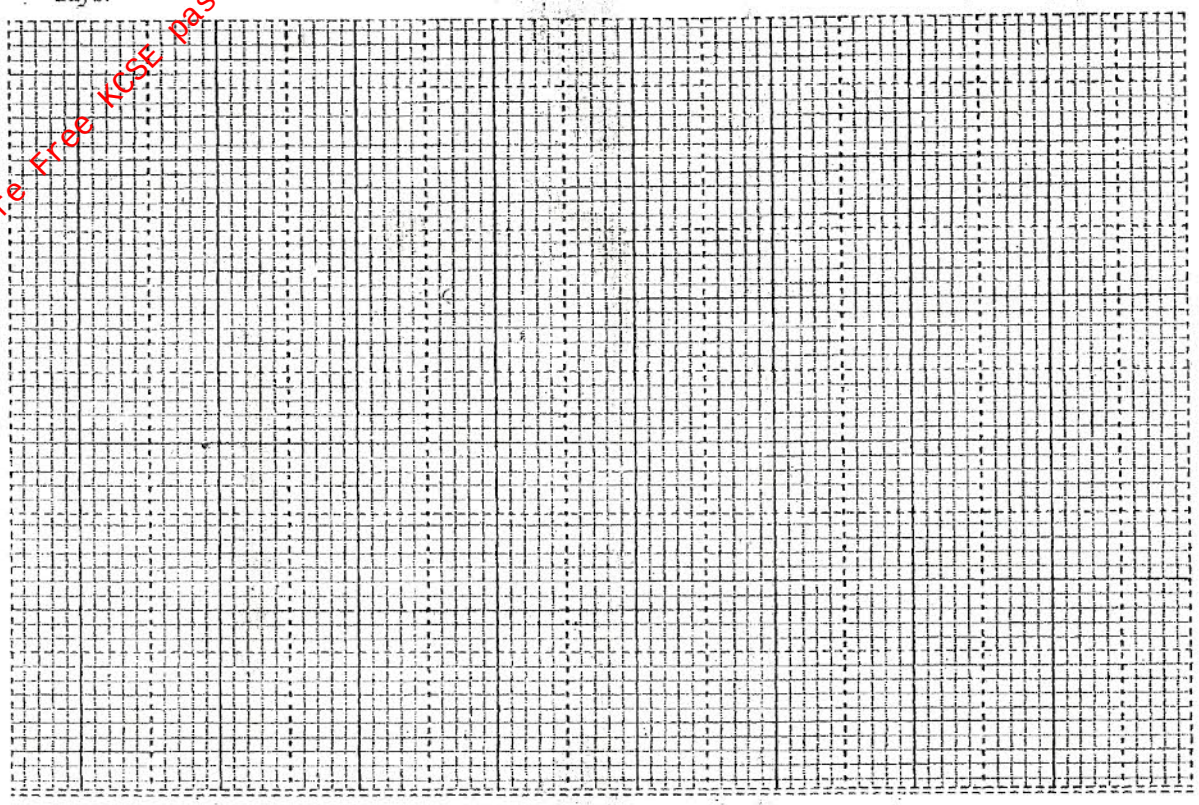
(b) A Geiger Muller tube without a radioactive substance near it recorded a count rate of 50 counts per minute. When a radioactive substance was held near the GM tube, the count rate was obtained after every two days and recorded in table 2.

Count rate in disintegration/min	**950**	**750**	**550**	**400**	**300**	**230**	**170**	**130**
Days	**0**	**2**	**4**	**6**	**8**	**10**	**12**	**14**

On the grid provided below, plot a graph of count rate in disintegrations.(Y-axis) against time in days. (5marks)



From the graph

(i) Determine the half-life of the radioactive material (1mark)

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(ii) Determine the appropriate count rate on the 11th day (1mark)

17. (a) Distinguish between intrinsic and extrinsic semi conduction. (2marks)

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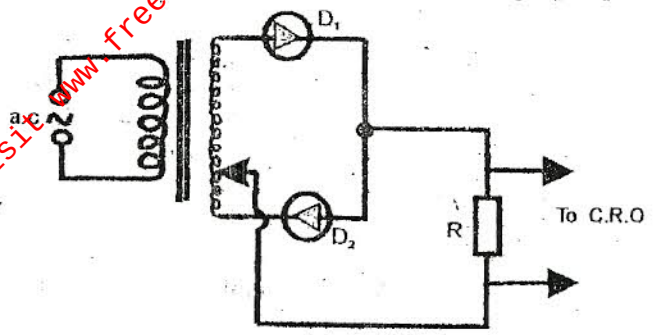
(b) (i) A student connected a circuit as shown below, hoping to produce a rectified output.



i) Sketch the graph of the output as seen on the C.R.O screen. (2 marks)

(c) The graph in fig.12 shows a forward bias characteristic of a p-n junction.

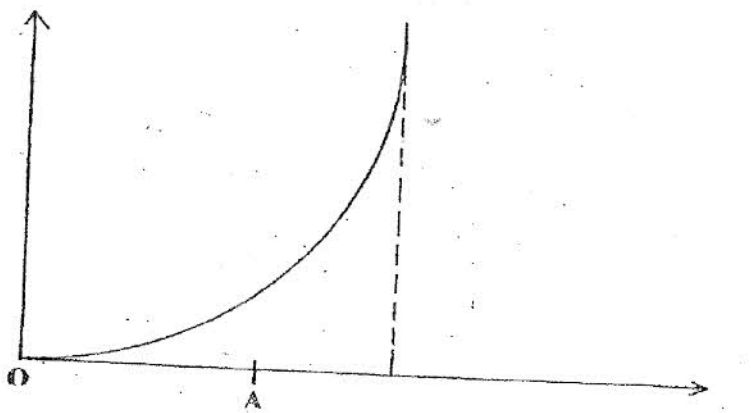


Figure 12

Explain what is meant by the graph in Figure 12. (3 marks)

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