

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

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

Date.....

232/2

PHYSICS

Paper 2

THEORY

JULY/AUGUST 2018

2 Hours

GATUNDU SOUTH COUNTY EVALUATION EXAMINATION
Kenya Certificate of Secondary Education

Instructions to candidates

1. Write your name, index number, school and date in the spaces provided above
2. Sign and write the date of the examination in the spaces provided above
3. This paper consists of two sections: A and B.
4. Answer all the questions in the spaces provided
5. All writing **MUST** be clearly shown in the spaces provided
6. Non programmable silent electronic calculators and KNEC mathematical table may be used.

FOR EXAMINER'S USE ONLY

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

This paper consists of 14 printed pages. Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.

SECTION A (25 MARKS)

1. Two electric heaters A and B rated 1000 W and 2500 W respectively are connected in parallel across a 240 mains supply. Calculate the ratio $R_A : R_B$ of their resistances. (3mks)

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2. Fig. 2 represents crests of water waves approaching a wide opening.

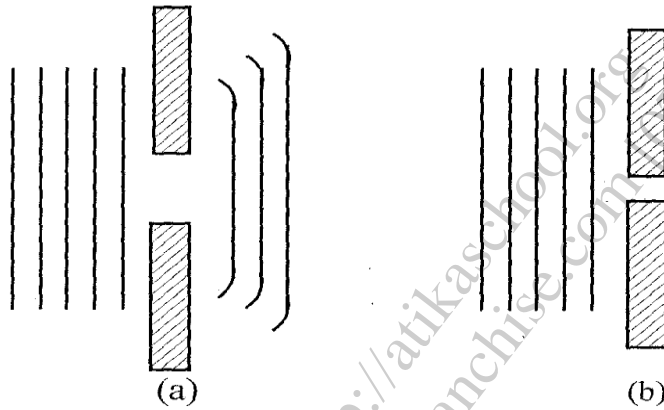


Fig. 2

Crests of the same water waves are now approaching a narrow opening. Sketch the crests after passing through the opening. (2mks)

3. One of the factors which affect the capacitance of a parallel plate capacitor is the area of overlap of the plates. Name **two** other factors. (2mks)

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4. Fig. 5 shows two rays of light incident on a water-glass surface.

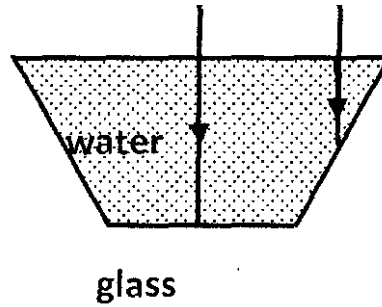


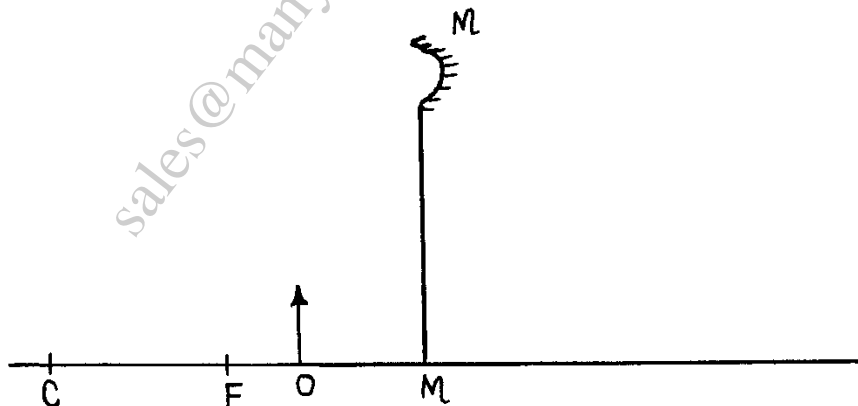
Fig. 5

Complete the rays to show their paths from the glass to water. (2mks)

5. The transmission of mains electricity on the national grid is at high voltage. Give a reason (1mk)

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6. The figure below shows an object O in front of a curved mirror M.
a) On the figure, locate the image formed. (2 marks)



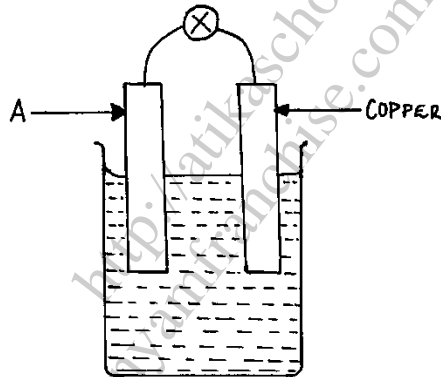
7. Complete the table by stating the different types of radiations (3 marks)

Type of radiation	Use
	Sending information to and from satellites
	Emitted by a remote control unit
	Producing shadow pictures of bones

8. The figure below shows a conductor carrying current placed in the magnetic field of two magnets. Complete the diagram by showing the field pattern and the direction of force F that acts on the conductor. (2mks)



9. The figure below shows a setup for a simple cell.



a) Name the electrode A (1 mark)

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b) Explain why the bulb goes off after only a short while (1 mark)

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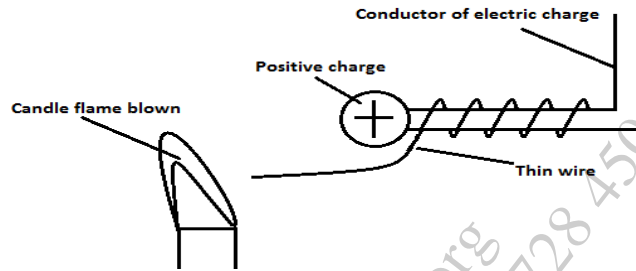
c) Explain how the defect can be minimized. (1 mark)

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10. Light of a certain wavelength strikes a metal surface. State two factors that determine the maximum kinetic energy of the electrons emitted (2 marks)

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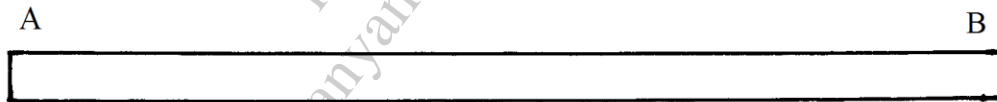
11. The figure below shows a thin wire connected to a charge generator and placed close to a candle flame.



Explain why the candle flame is deflected as shown (2 marks)

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12. You are provided with a long metal steel rod as shown below.



On the diagram, show how you would magnetize end A to obtain a south pole using an electric current. (2marks)

SECTION B (55MARKS)

13. The figure below shows an x-ray tube

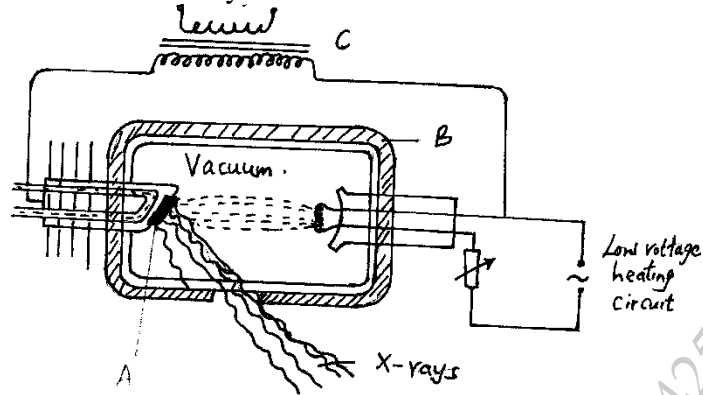


Fig. 6

a) i) Name the elements used in making the parts labeled A and B. (2 marks)

A

B

ii) Explain the use of the part labeled C. (1 mark)

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iii) Explain how the x-rays are produced. (3marks)

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b). (i) Give a reason why X-ray tube is evacuated. (1mk)

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(ii) How is the intensity of X-rays increased?

(1mk)

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c) The energy of x-ray is 1.989×10^{-14} joules. Given that the speed of light is 3.0×10^8 m/s and plank's constant is 6.6×10^{-34} Js, find the wavelength of the x-rays. (3 marks)

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14. a) The figure below shows the diagram of a Geiger – Muller tube connected to a power supply and a pulse counter.

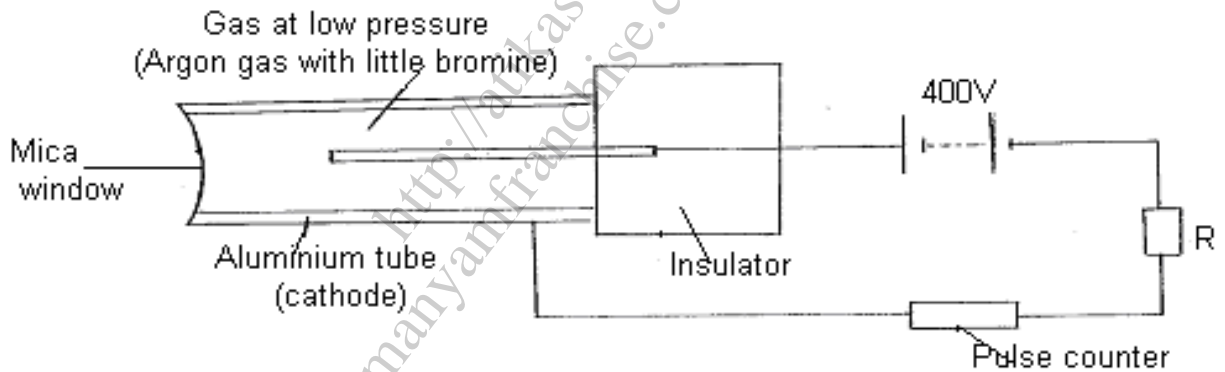


Fig. 5

(i) Why should the Argon gas be at low pressure?

(1 mark)

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(ii) Briefly explain how the Geiger – Muller tube detects the radiation emitted by a radioactive element (3 marks)

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(iii) State the purpose of the bromine gas in the tube (1 mark)

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b) A radioactive element A of half-life 31 days' decays to element B. A sample of A of mass 32g is kept in a container. Assuming B is stable; calculate the mass of B that will be in the container after 124 days. (3 marks)

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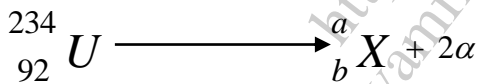
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c) Find the value of a and b up the following equation (2 marks)



a =

b =

15. a) The circuit diagram in figure 8 shows three identical resistors connected to a cell of e.m.f. 12V.

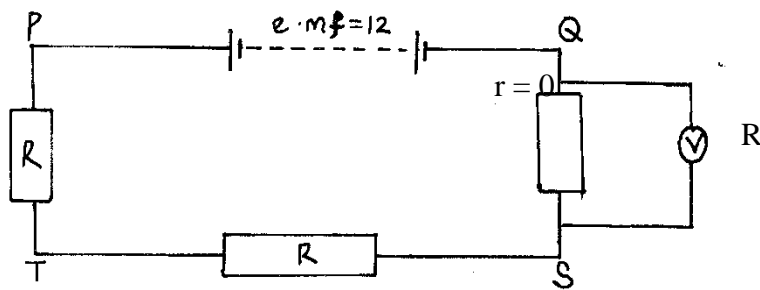


Figure 8

(i) Determine the reading of the voltmeter.

(2 marks)

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(ii) If another identical resistor R is connected parallel to PT, determine the potential difference across QS (3 marks)

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b. (i) Distinguish between semi-conductors and conductors.

(2 marks)

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(ii) Give one example of a semi-conductor and one example for a conductor. (2 marks)

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(iii) What is meant by donor impurity in a semi-conductor.

(1 mark)

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(iv). Draw a circuit diagram including a cell, a diode and a resistor in the reverse biased mode.
(1 mark)

(v). In the circuit in figure 12 below, when the switch is closed, the voltmeter shows a reading. When the cell terminals are reversed and the switch is closed the voltmeter reading is zero.

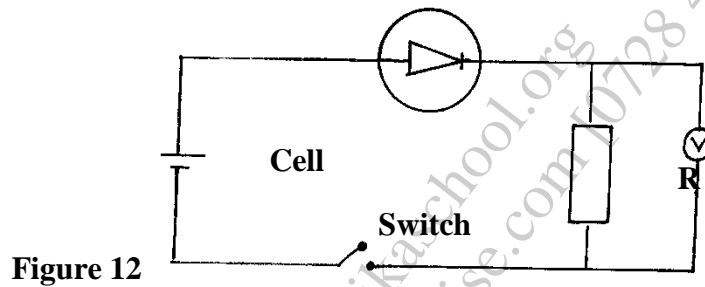


Figure 12

Explain this observation.

(2 marks)

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16. a) State one difference between:
Mechanical and electromagnetic waves.

(1mk)

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(b) Briefly describe how sound is propagated in air. (2mks)

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(c) Fig. 6 shows a set up by a student.

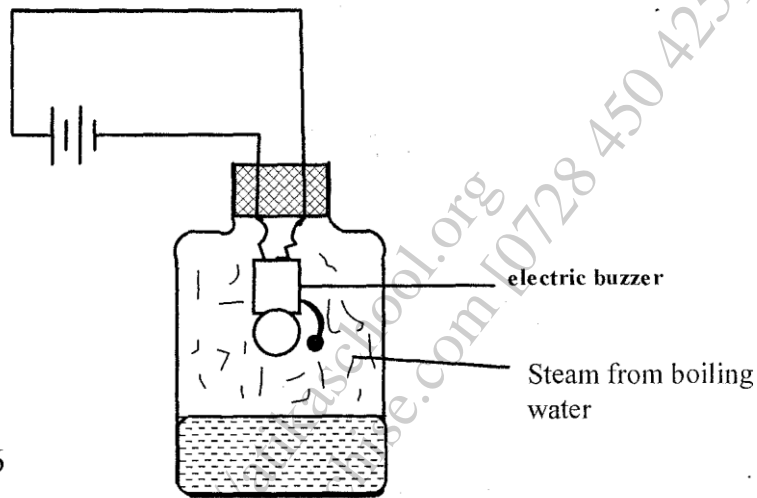


Fig. 6

(i) State what happens to the sound from the buzzer as the bottle and its contents are cooled to 0°C . (1mk)

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(ii) Explain the observation you have stated in (i) above. (3mks)

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- (d) A boy standing in level ground between two high walls claps his hands. He hears an echo from one wall after 0.7s and from the other wall 0.2s later. Determine the distance between the two walls. (Speed of sound in air $v = 330 \text{ ms}^{-1}$) (3mks)

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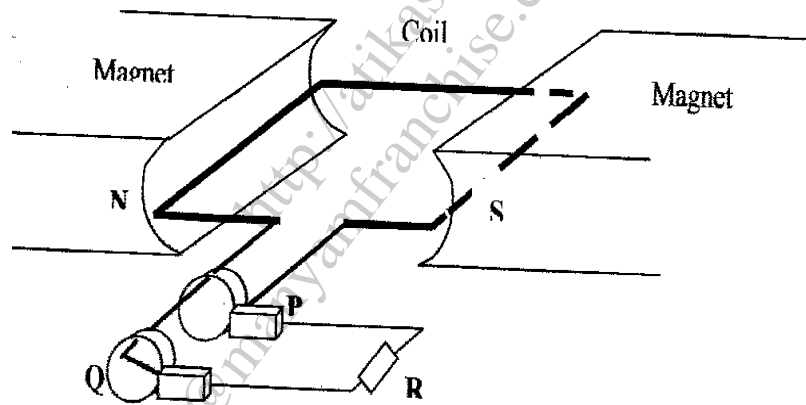
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17. The figure below shows a simple electric generator.



- a) i) Name the parts labeled P and Q (2 marks)

P.....

Q.....

ii) State two ways of increasing the magnitude of the induced current in this type of generator. (2 marks)

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b) The primary coil of a transformer has 1200 turns and the secondary coil has 60 turns. The transformer is connected to a 240v a.c source. Determine the:

i) Output voltage (2 marks)

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ii) Output current when the primary coil has a current of 0.5A. Assume there are no energy losses. (2marks)

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c) **Figure 12** shows a magnet being moved towards a stationary solenoid. It is observed that a current flow through the circuit in a direction Q to P.

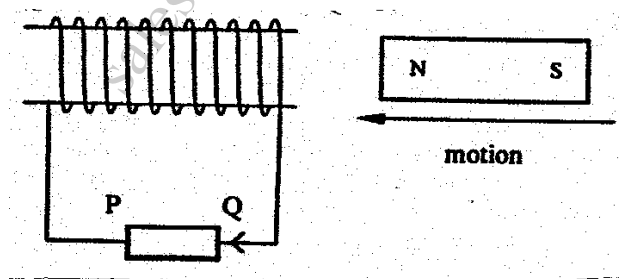


Figure 12

Explain why the current flows from Q to P

(1 mark)

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d). State **two** ways in which power is lost in a transformer (2 marks)

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