NAME……………………………………… ADMNO…………………………..…………

CLASS…………………………………….

232/2 DATE………..…………………….......
PHYSICS
PAPER 2
(THEORY)
KCSE MOCKS 2017

2 HOURS

INSTRUCTIONS TO CANDIDATES

1. Write your name, index number and school in the spaces provided above.
2. Sign and write the date of examination in the spaces provided above.
*3. This paper consist of **TWO** sections; **A** and **B**.*
*4. Answer **ALL** the questions in section **A** and **B** in the spaces provided.*
*5. **ALL** working **MUST** be clearly shown.*
6. Non-programmable silent electronic calculators and KNEC Mathematical tables may be used.

For Examiner's Use Only

| Section	Question	Maximum Score	Candidate's Score
A	1-11	25	
B	12	8	
	13	8	
	14	11	
	15	12	
	16	9	
	17	7	
Total Score		80	

SECTION A: (25 MARKS)

Answer all questions this section in the spaces provided below each question.

1.   The figure **below** shows emergent rays as seen by the eye after reflection from a plane mirror. Complete the ray diagram on the figure **below** to show the actual position of the object.   (2 marks)

Plane Mirror
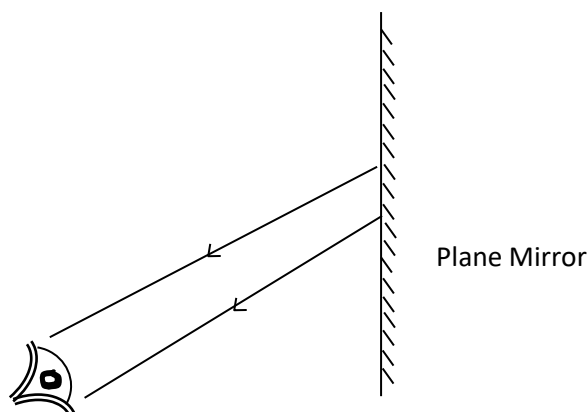
2.   The figure **below** shows a battery of e.m.f.3.0V connected in series with two capacitors.

S

3.0V

3.0µF   3.0µF
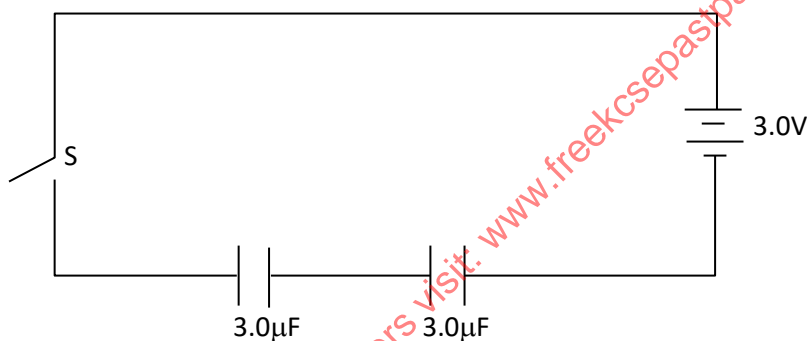
Determine the charge stored in the combined capacitors when the switch is closed.   (3 marks)

3.   Give a reason why repulsion in magnetism is the surest way of testing polarity.   (1 mark)

4. State **two** defects of a simple cell and how each can be corrected. (2 marks)

_____

_____

5. (a) Distinguish between a real and a virtal image. (1 mark)

    _____

    _____

    (b) State **one** application of each of the following: (2 marks)
        (i) Convex mirrors.

        _____

        _____

        (ii) Parabolic mirrors.

        _____

        _____

6. State **two** ways through which the electrical conductivity of a semi-conductor can be increased. (2 marks)

_____

_____

7. The figure **below** shows two parallel current carrying conductors A and B placed close to one another. Current flows in the opposite directions.
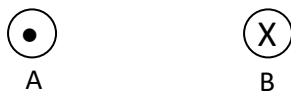

Skech on the figure the magnetic field pattern formed by the two conductors. (1 mark)

8. (a) State **one** reason why the CRO is a more accurate voltmeter than a moving coil voltmeter. (1 mark)

    _____

(b)   The figure **below** shows the trace on the screen of C.R.O when an a.c. signal connected to the y –plates with time base on. Given that the time base control is 100ms/div and the y-gain is at 120V/div, determine the frequency of the a.c. signal.   (2 marks)

_____

_____

_____
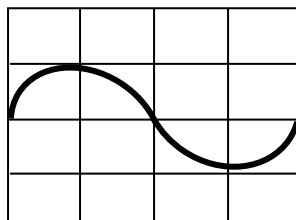
9.   The figure **below** shows part of a ring main circuit connected to the hair drier in a salon.
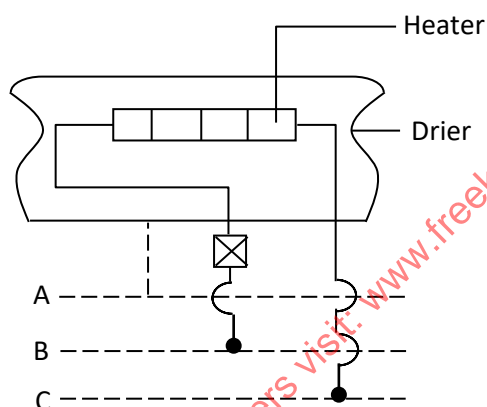
Identify the wires.   (3 marks)

A _____

B _____

C _____

10.   The refractive indices of water and glass are $\frac{4}{3}$ and $\frac{3}{2}$ respectively.
Determine the refractive index of a ray of light moving from water to glass.   (3 marks)

11. The table **below** shows part of the electromagnetic spectrum in order of decreasing wavelength.
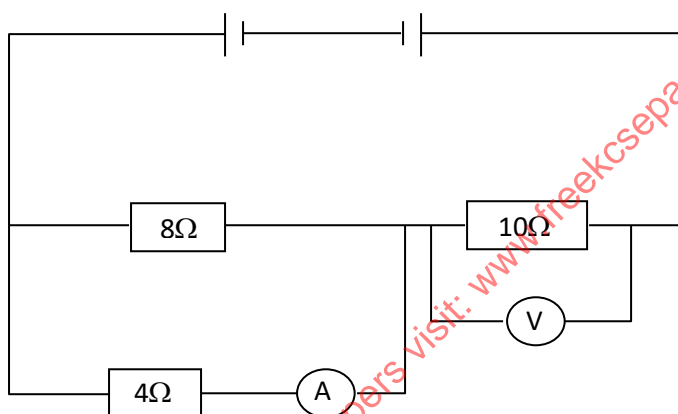
A	B	Infrared radiation	Visible light	C	D

(a) How are waves **C** produced? (1 mark)

_____

_____

(b) State **one** use of the wave **D**. (1 mark)

_____

_____

SECTION B: (55 MARKS)

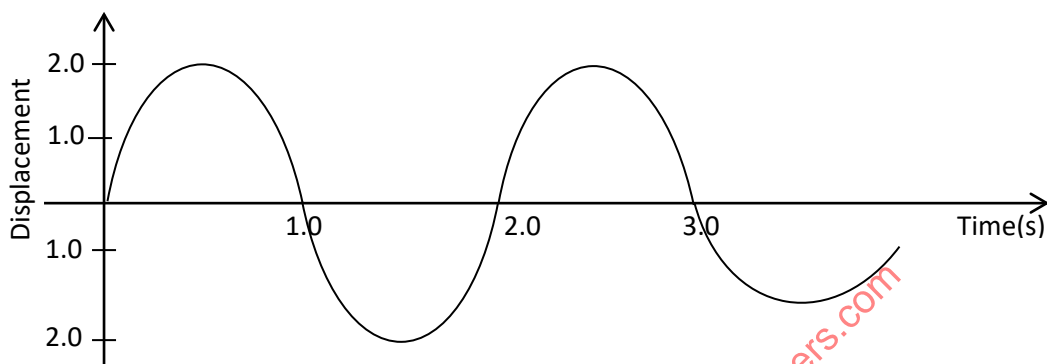12. (a) The figure **below** shows a circuit with ammeter reading 1.5A.

Determine the voltmeter reading. (3 marks)

_____

_____

_____

_____

(b) Determine how many bulbs each rated 75W, 240V can be safely used in a main's supply of 240V fitted with a fuse 13A fuse. (3 marks)

(c)   State **two** factors that affect the heating effect of an electric current.   (2 marks)

_____

_____

_____

13.

(i)   The figure **above** represents an oscillation taking place at a particular point when a sound
       wave in a gas passes the point. The vertical axis represents displacement.
       (i)   Explain what is meant by displacement in this context.   (1 mark)

       _____

       _____

       (ii)   From the graph, determine.
              (a)   Period _____   (1 mark)

              (b)   Frequency _____   (2 marks)

       (iii) Calculate the wavelength of the sound wave in the figure above. (Speed of sound in
              gas is 340m/s).   (3 marks)

       (iv)   State **two** factors that increases the speed of sound in solids.   (2 marks)

       _____

       _____

6

14. The circuits in the figure shown **below** are close to each other.
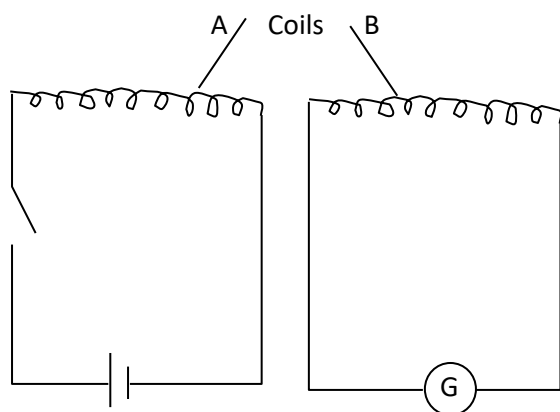
(a) When the switch is closed, the galvanometer shows a reading and then returns to zero. When the switch is then opened the galvanometer shows a reading in the opposite direction and then returns to zero. Explain these observations. (3 marks)

_____

_____

_____

_____

(b) Energy losses in a transformer are reduced by having a laminated soft iron core. State and explain two other waves of reducing energy loses in a transformer. (4 marks)

_____

_____

_____

_____

(c) The e.m.f generated as the coil of an alternating generator rotates is represented in the graph **below**.
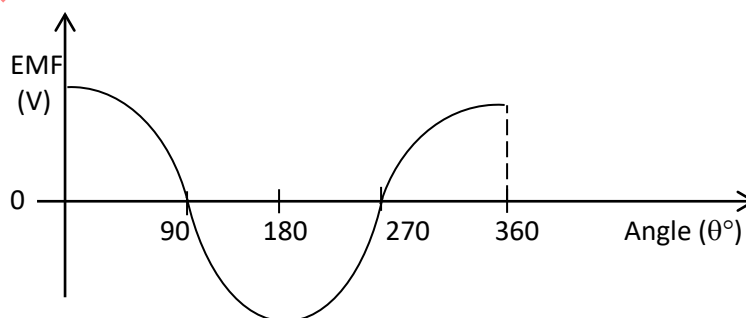
(i) Give reasons for the changes in e.m.f as the coil rotates from 0° to 90° and 90° to 180° (2 marks)

_____

_____

_____

7

(ii)   Sketch on the same diagram a similar graph if the geneator was a direct current one.

(2 marks)

15.   (a)   Define work function.   (1 mark)

_____

_____

_____

(b)   In an experiment to find the relationship between frequency of radiation and kinetic energy of a photoelectron in photoelectric device, the following result were obtained.

Frequency ($f \times 10^{-14}$Hz)	7.5	6.7	6.0	5.2	4.8
Stopping potential, V(V)	1.8	1.5	1.25	0.9	0.75

(i)   On the grid draw the graph of stopping potential (V) against frequency.   (5 marks)
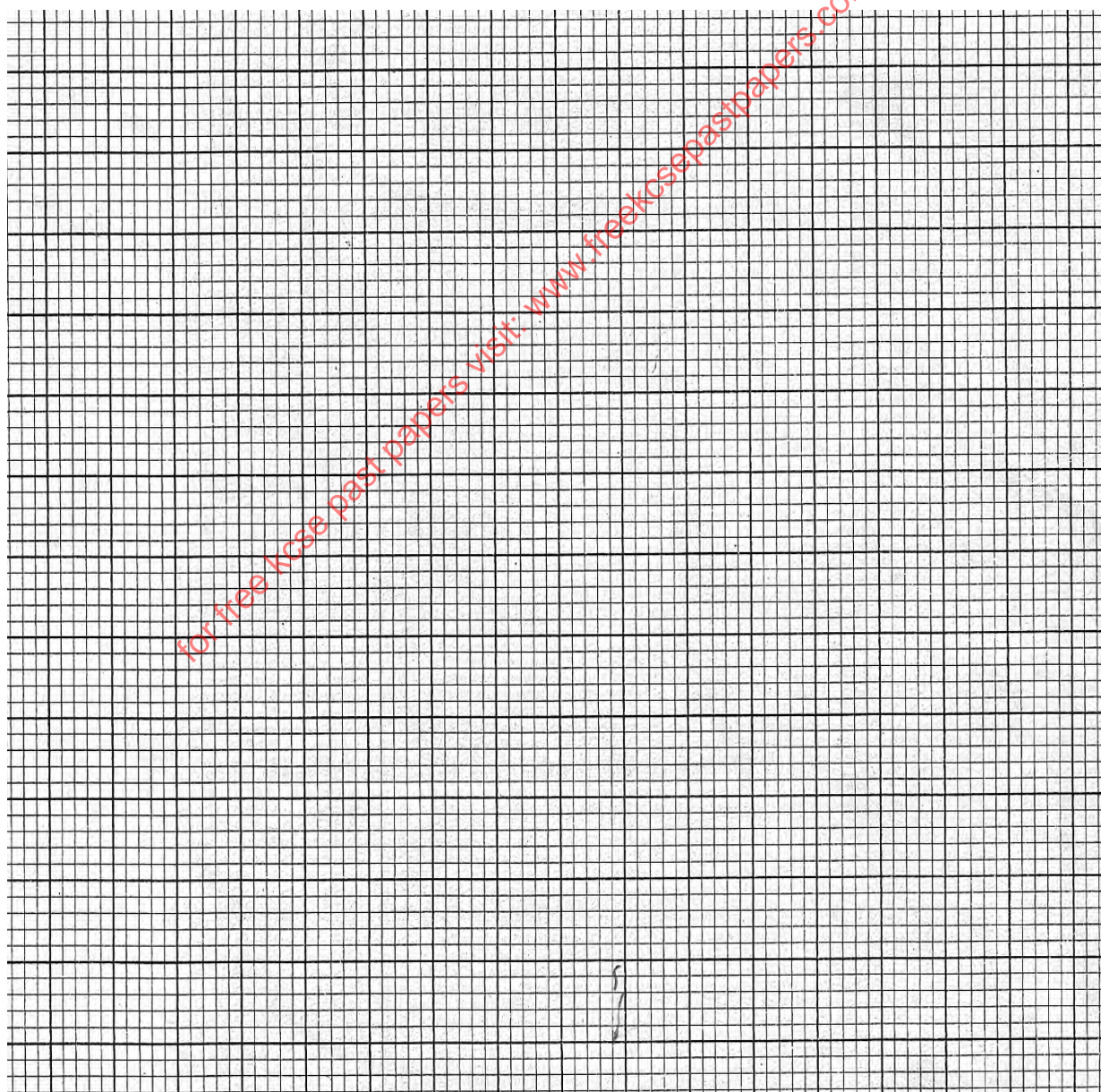
(ii)   From the graph find:
    (a)   The threshold frequency.   (1 mark)

    (b)   Plank's constant. (Charge on an electron is 1.6×10^{-19}C).   (3 marks)

    (c)   The work function of the metal in joules using the planks constant.
         Calculated in *(b) above*.   (2 marks)

16.   (a)   The following is a list of particles: protons, neutrons, electrons, alpha particles, beta particles.
        State which **two** of the particles.
        (i)   Are positively charged.   (1 mark)

_____

_____

(ii)   Are found in the nucleus.   (1 mark)

_____

_____

(iii) Occurs in equal numbers in all neutral atom.   (1 mark)

_____

_____

(b)   An element X decays by giving off an alpa particle. Complete the equation below showing
      the values of a and b.

$$^{236}_{92}X = {}^{a}_{b}y + {}^{4}_{2}He$$
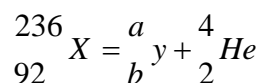
a = _____   (1 mark)

b = _____   (1 mark)

(c)   (i)   What do you understand by the terrn background radiation.   (1 mark)

_____

_____

_____

_____
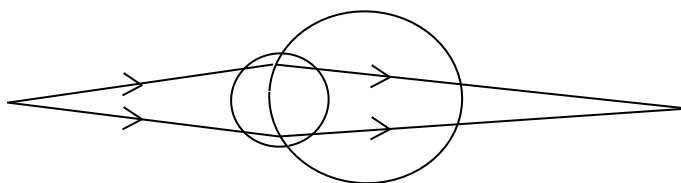
(ii)   State any **two** source of background radiation.   (2 marks)

_____

_____

(iii) State **one** application of radioactivity.   (1 mark)

_____

17.   (a)   State **one** similarity between a diverging lens and convex mirror.   (1 mark)

_____

_____

A lens forms an image on a screen whose size is thrice that of the object. State with a reason the lens used.

(2 marks)

_____

_____

_____

(c) (i) The figure **below** shows an eye defect.

State the defect.   (1 mark)

_____

(ii) Use a ray diagram to show how the defect above could be corrected.   (1 mark)

(d) A convex lens forms an image three times the size of the object on the screen. If the distance between the object and the screen is 72cm, determine the object distance.   (2 marks)