

NAME:.....INDEX NO.ADM NO.....

232/2

Signature: Date:

**PHYSICS
PAPER 2**

**MARCH/APRIL 2020
TIME: 2 HRS.**

**ARISE AND SHINE TRIAL 1 EXAM
MARCH/APRIL 2020**

INSTRUCTIONS TO CANDIDATES:

- (a) Write your **Name** and **Index Number** in the spaces provided above.
- (b) **Sign** and write the **date** of examination in the spaces provided above.
- (c) This paper consists of two sections; **A** and **B**.
- (d) Answer **ALL** the questions in Section **A** and **B** in the spaces provided.
- (e) All workings must be clearly shown.
- (f) Non-programmable silent electronic calculators and KNEC Mathematical tables may be used.

FOR EXAMINER’S USE ONLY:

SECTION	QUESTION	MAXIMUM SCORE	STUDENT’S SCORE
A	1 - 13	25	
	14	12	
B	15	14	
	16	08	
	17	10	
	18	11	
TOTAL SCORE		80	

SECTION A (25 MARKS)

Answer all questions in this section in the spaces provided.

1. The figure below shows two point sources of light with an opaque object placed between them and the screen.



Complete the diagram to show the nature of the shadows formed. Label the shadows. (2 marks)

.....

.....

.....

2. A boy watching fireworks display sees the light from an explosion and hears the sound 2.5 seconds later. Determine how far the explosion is. (Speed of sound in air 330m/s). (2 marks)

.....

.....

.....

3. The table in figure 9 below shows part of the electromagnetic spectrum in order of decreasing wavelength.

A	B	INFRA RED RADIATION	VISIBLE LIGHT	C	D
---	---	---------------------	---------------	---	---

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

.....

.....

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

.....

.....

4. A polythen rod held in the hand can be charged by rubbing it with cloth but a metal rod cannot be charged in a similar way. Explain why. (2 marks)

.....

.....

.....

5. An object X is brought close to, but not touching, a bar magnet which placed on an electronic balance as shown in figure 3. The reading on the balance decreases. Explain this observation. (1 mark)

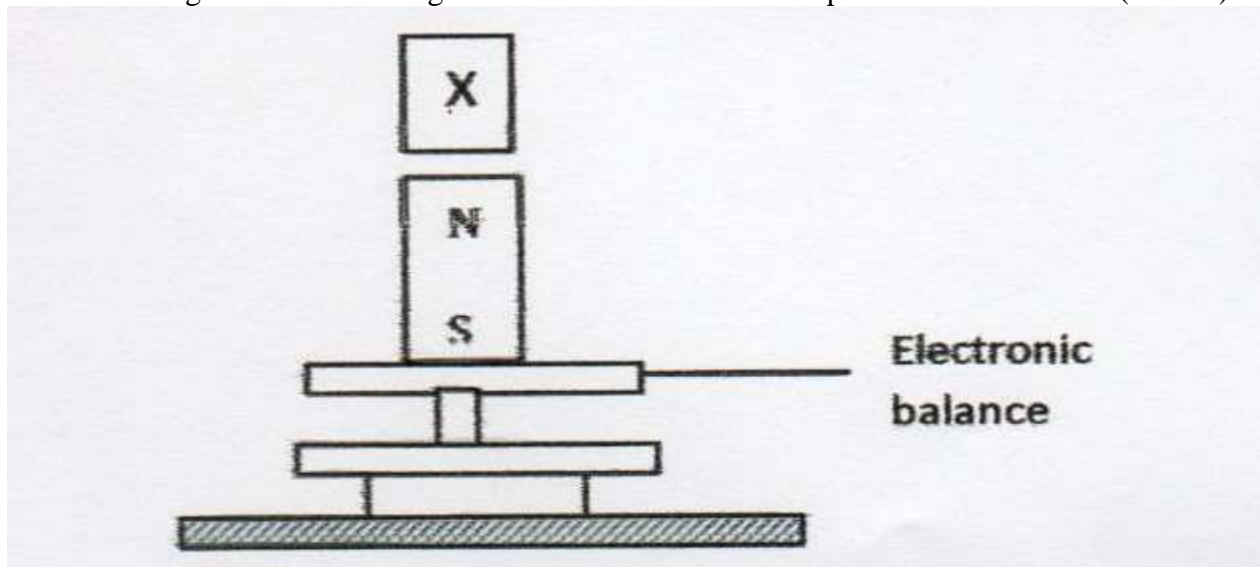


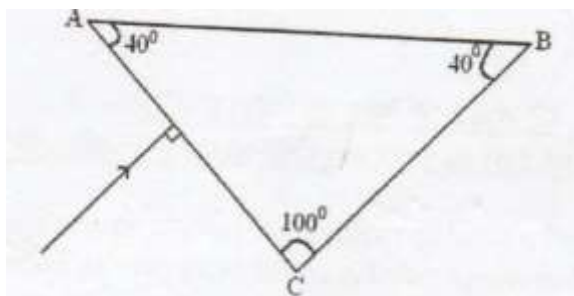
Figure 3

.....
.....
.....

6. A pendulum bob takes 0.5 second to move from its mean position to a maximum displacement position. Calculate its frequency. (2 marks)

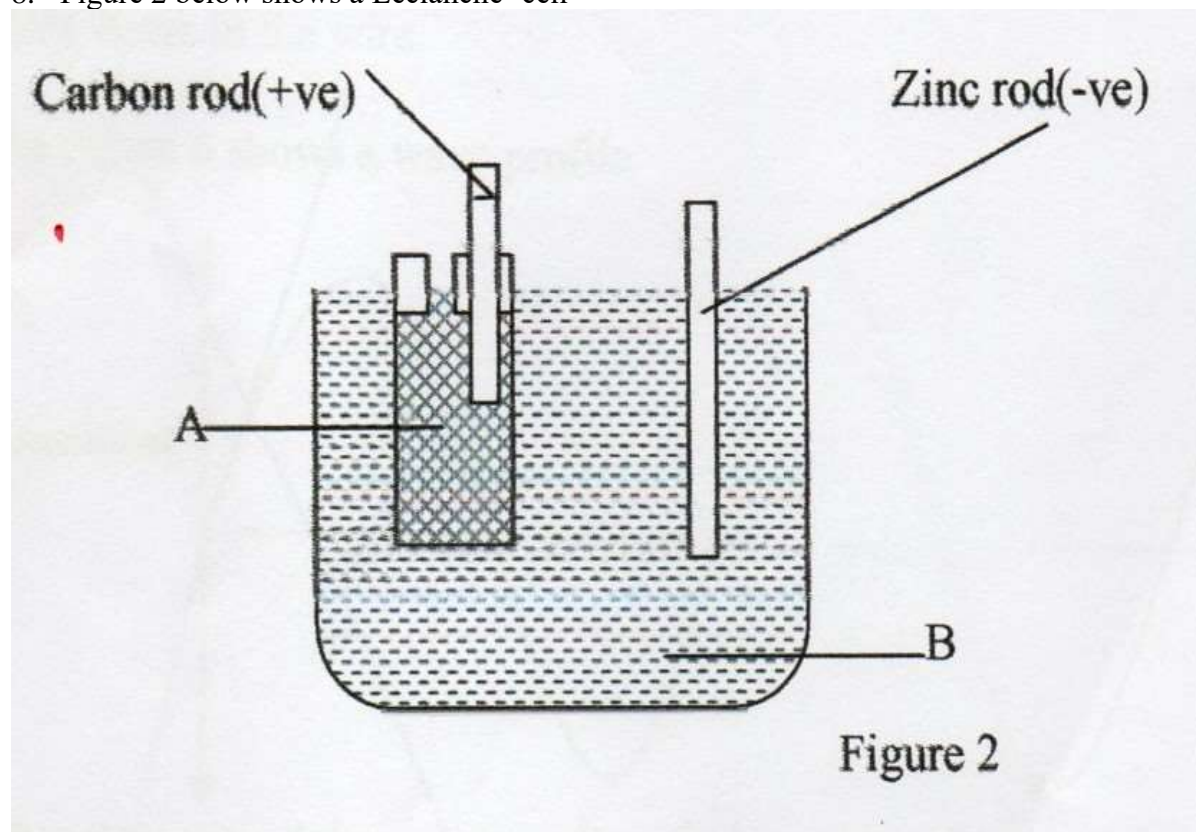
.....
.....
.....

7. The figure below shows a ray of light incident on a glass prism.



Given that the critical angle for the glass is 39° , **sketch** on the diagram the path of the ray through the prism. (2 marks)

8. Figure 2 below shows a Leclanche' cell



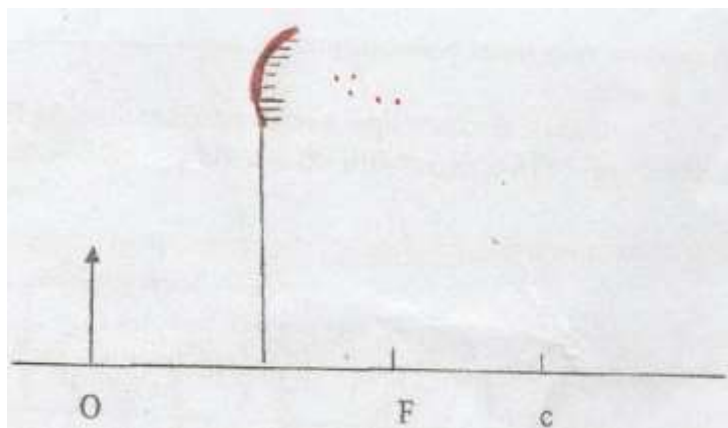
Name the chemical substances in the parts labeled.

A.....

(2 marks)

B

9.



Draw rays to locate the position of the image.

(2 marks)

10. A plotting compass is placed above an insulated wire shown in figure 5

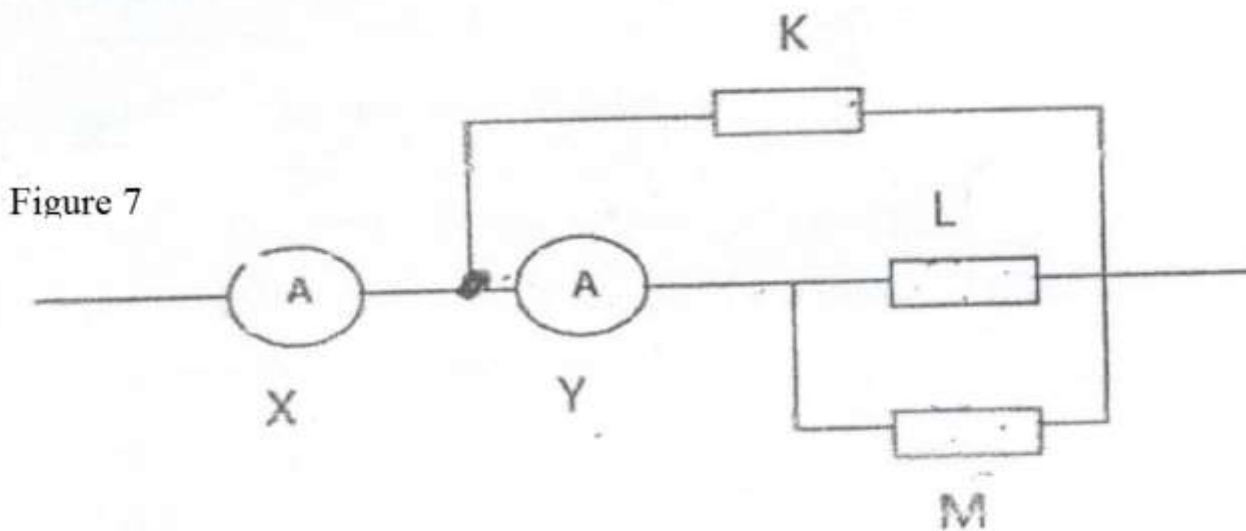


When current is switched on the North Pole deflects as shown. Indicate the direction in which the current flow in the wire.

(1 mark)

11. The three resistors K, L and M in figure 7 have equal resistance. If the reading on ammeter X is 6A, determine the reading on ammeter Y?

(3 marks)



.....
.....
.....
.....

12. State two factors that determine the magnitude of an induced e.m.f in a conductor. (2 marks)

.....
.....

13. (a). Explain why filament bulbs use more energy as compared to fluorescent tubes. (2 marks)

.....
.....
.....
.....

SECTION B (55 MARKS)

Answer all questions in this section

14. The following data was collected to find the focal length of a convex lens

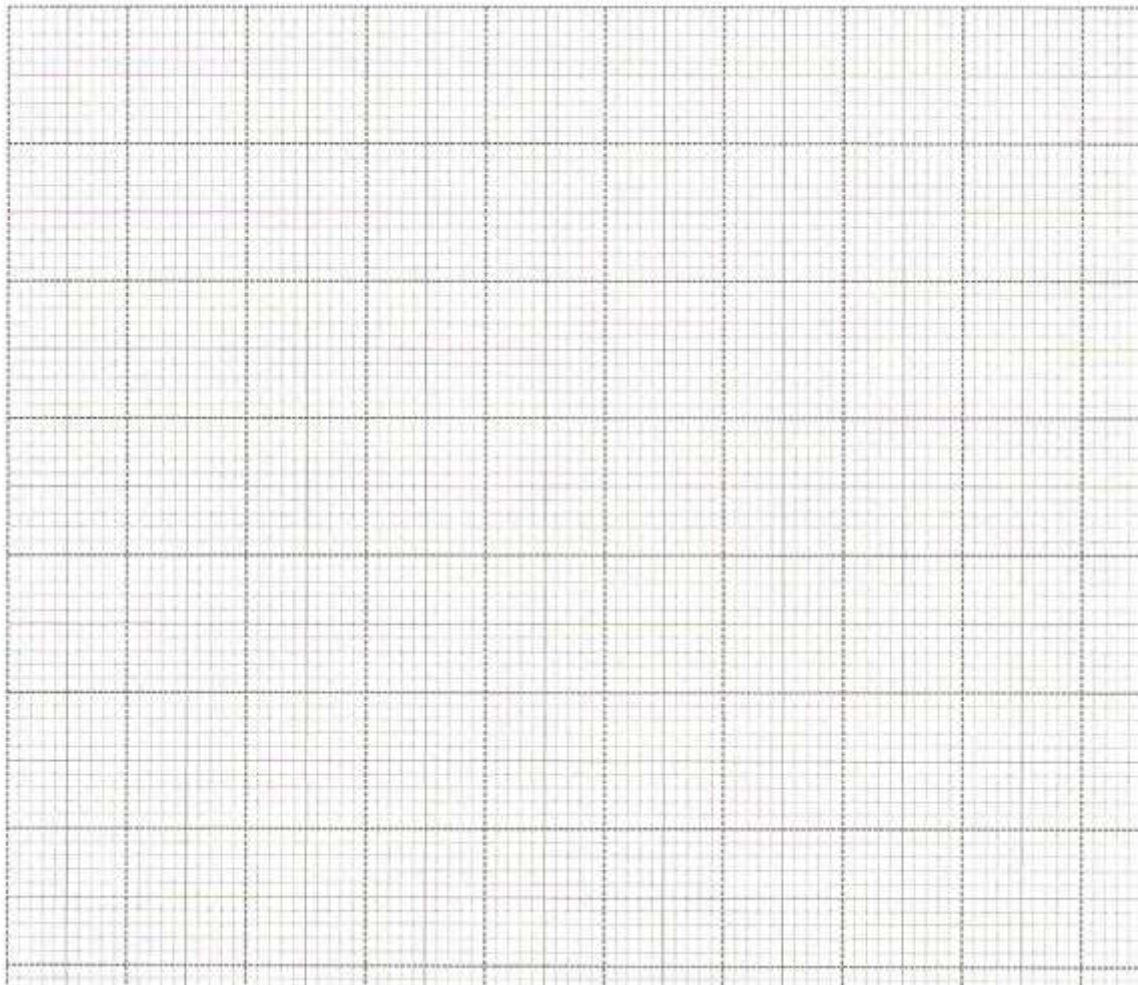
Object distance,u,cm	44.3	30.0	23.9	20.0	15.0
Magnification	0.3	0.5	0.7	1.0	2.0
Image distance,v,cm					

(a). Complete the table.

(2 marks)

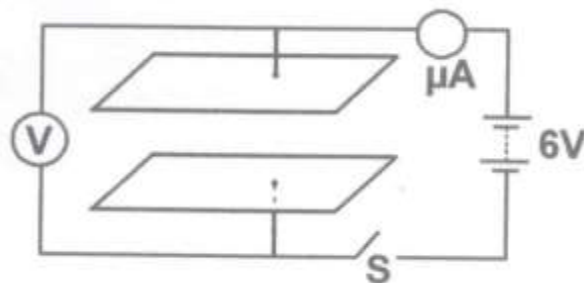
(b). Plot a graph of magnification against image distance

(5 marks)



- (c). From the graph, determine f , the focal length of the lens (3 marks)
 (d). Determine the power p of the lens. (2 marks)

15. (a). Figure below shows two parallel plate capacitors connected to a battery. Initially the switch S is open.



The switch is now closed and left for a few seconds.

- I. In the space below sketch a graph of current reading with time from time the switch is closed. (2 marks)

.....
.....
.....

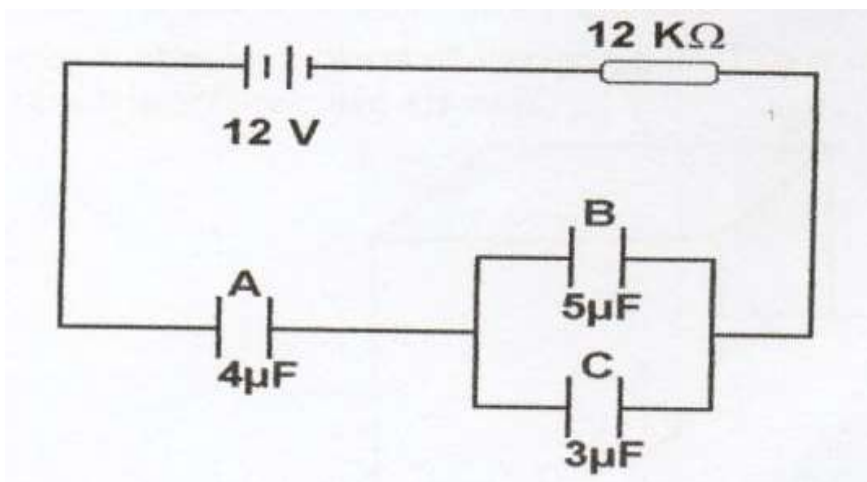
II. Determine the reading of V after a long time. (1 mark)

.....
.....

III. How does the capacitance of the plates change when the plates are moved further apart? (1 mark)

.....
.....

(b). Figure below shows an electrical circuit with three capacitors A,B and C and a resistor of value $12K\Omega$ and a p.d of 12V across the capacitors. (2 marks)



Determine:

I. the current flowing in the system. (2 marks)

.....
.....

II. the total capacitance of the capacitors (3 marks)

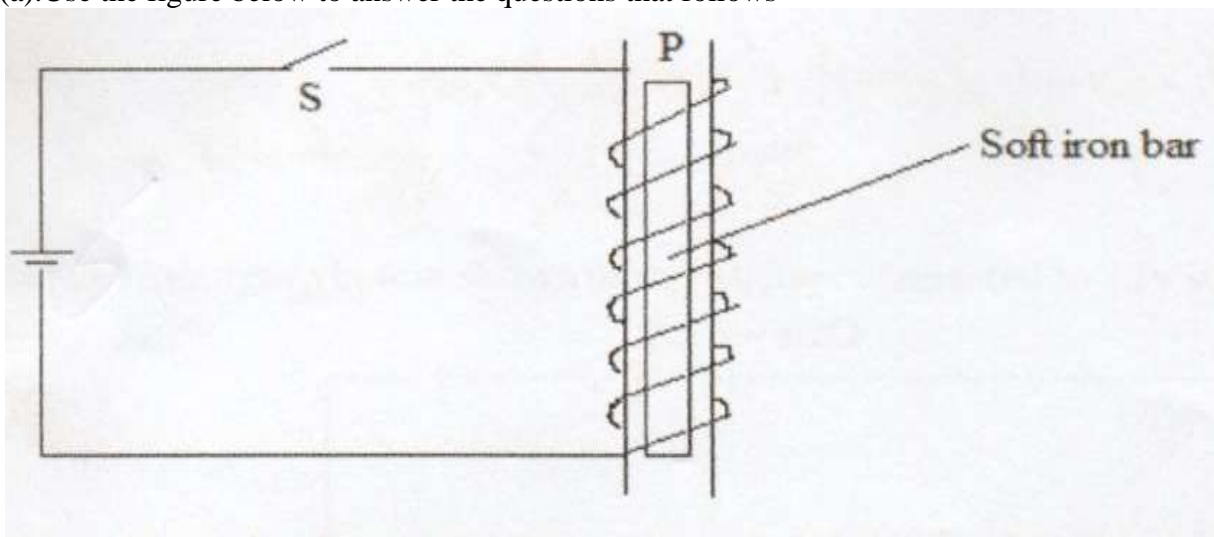
.....
.....
.....

III. the total charge stored in the capacitors (3 marks)

.....
.....

.....
.....
.....
.....

16. (a).Use the figure below to answer the questions that follows



I. Show the direction of the current on the turns when the switch S is closed. (1 mark)

.....
.....

II. State the polarity at P. (1 mark)

.....
.....

III. Explain using domain theory what happens on the soft iron bar. (1 mark)

.....
.....

IV. If steel bar was used instead, what could be the difference? (1 mark)

.....
.....

(b). Figure below shows a current carrying coil in a magnetic field. The direction of the current and the resulting force are shown.

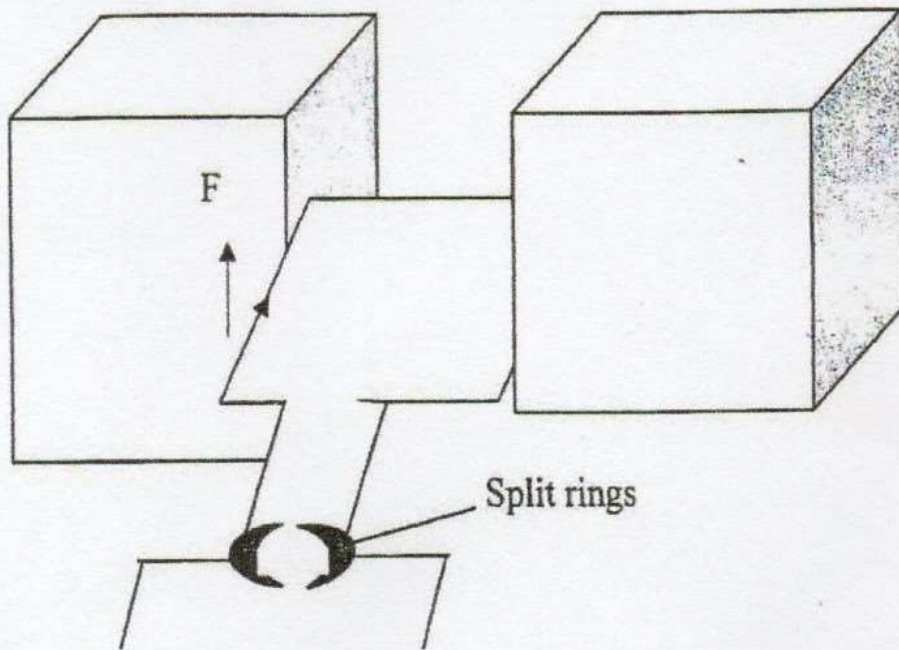


Figure 11

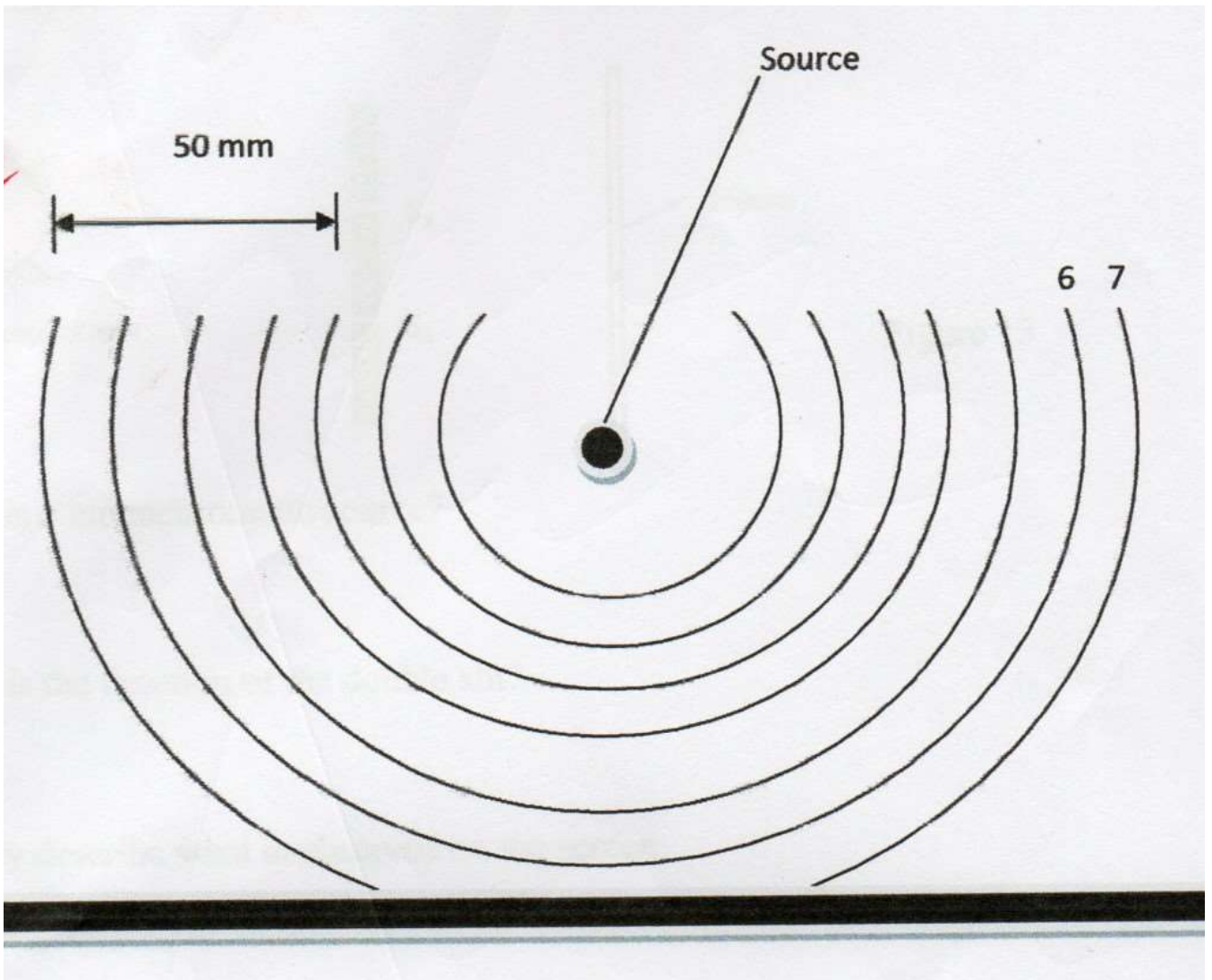
(I). State the importance of using split rings instead of complete rings. (1 mark)
.....
.....

(II). Indicate the polarity of the magnets if the force developed acts as shown in the diagram. (1 mark)
.....
.....

(III). State one factor that would be altered to change the speed of the coil. (1mark)
.....
.....

(c). Give a reason why attraction in magnetism is not regarded as a reliable method of testing polarity of a magnet. (1 mark)
.....
.....
.....

17. (a).(i). Copy and complete the diagram to show how crest 6 and 7 are reflected. (1 mark)



(ii). From the figure determine the wavelength of the water waves.

(1 mark)

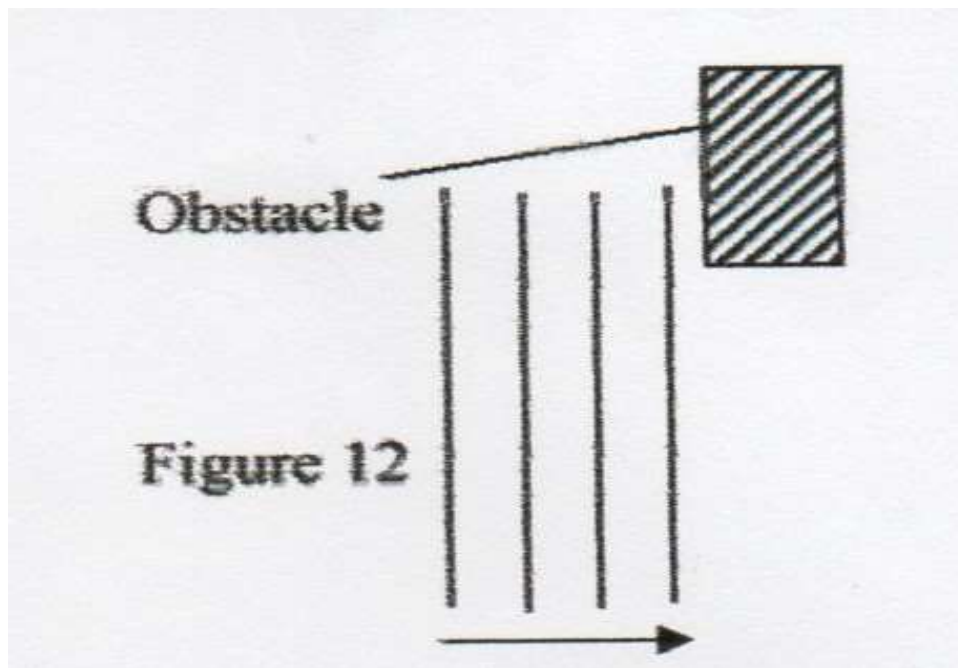
.....
.....

(iii). Find the frequency of the waves if their speed is 60mm/s

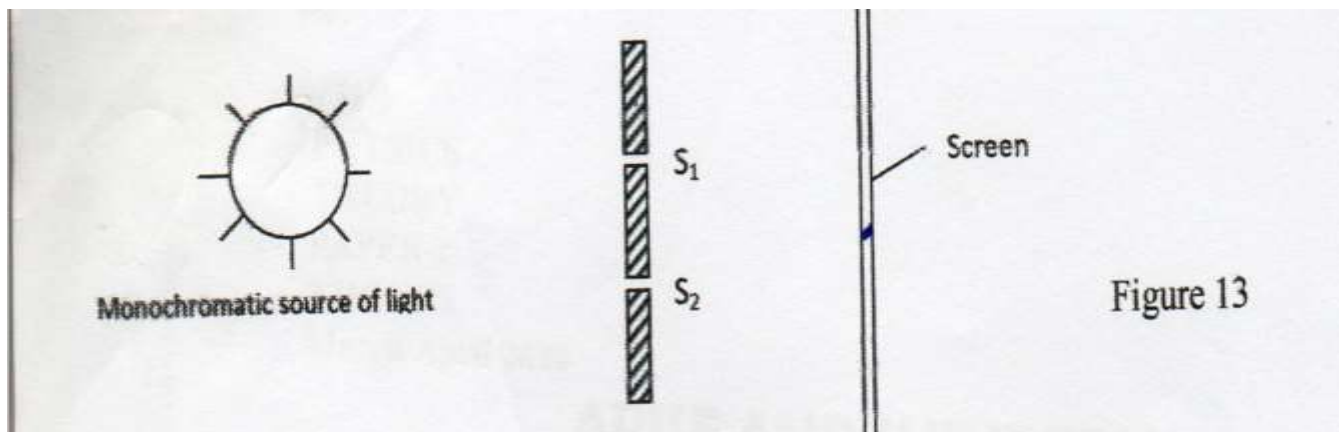
(2 marks)

.....
.....
.....
.....

(b). Figure 12 below shows wave - fronts approaching an obstacle. Complete the diagram to show the wave fronts as they pass the obstacle and beyond. (2 marks)



(c)(i). In an experiment to observe interference in light a double slit was placed close to a source of light as shown below.



I. What is a monochromatic source? (1 mark)
.....
.....

II. What is the function of the double slit? (1 mark)

.....
.....

III. Briefly describe what is observed on the screen. (1 mark)

.....
.....

(ii). Briefly explain what is observed on the screen when:-

I. The distance between the slits is reduced. (1 mark)

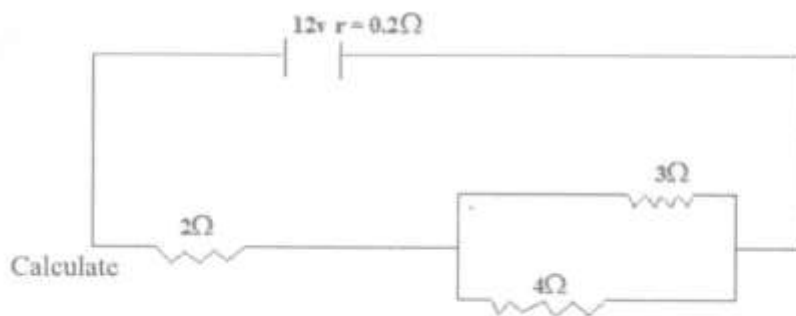
.....
.....

II. White light is used. (1 mark)

.....
.....

18. (a). State ohm's law (1 mark)

.....
(b). The figure below shows three resistors connected to 12v supply of internal resistance of 0.2Ω



Determine:

I. the effective resistance. (3 marks)

.....
.....
.....

II. the total current in the circuit. (2 marks)

.....
.....
.....

III. The current through the 4Ω resistor.

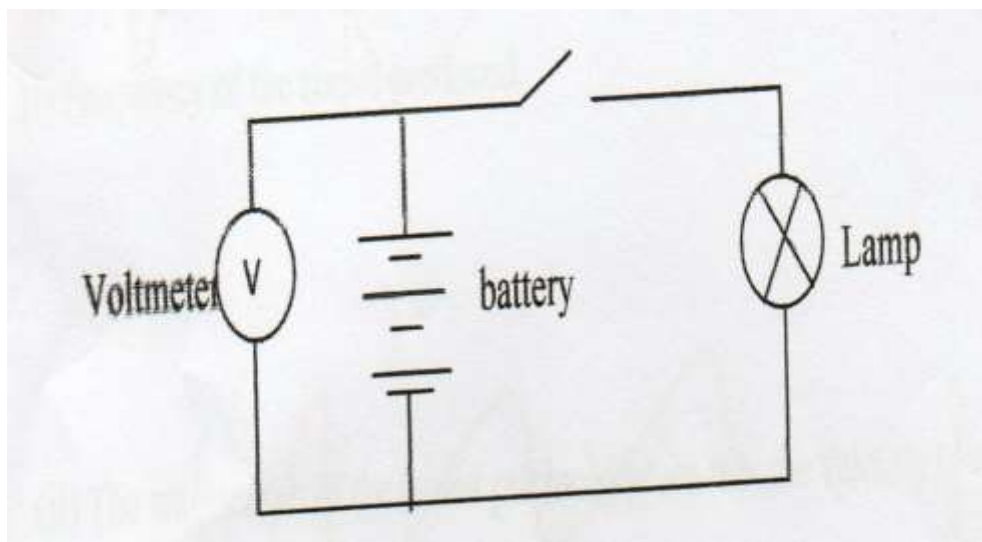
(2 marks)

.....

.....

.....

(c). Figure 9 shows a battery connected in series with a switch and a lamp. A high resistance voltmeter is connected across the terminals of the battery.



- The voltmeter reads 4.5V when the switch is closed and 3.6V when the battery drives a current of 0.3A through the lamp.

Determine

(a). The e.m.f of the battery.

(1 mark)

.....

.....

(b). The terminal p.d of the battery when supplying a current of 0.3A

(1 mark)

.....

.....

(c). The p.d across the lamp

(1 mark)

.....

.....