**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:**

1. Write your **Name** and **Index Number** in the spaces provided above.
2. **Sign** and write the **date** of examination in the spaces provided above.
3. This paper consists of two sections; **A** and **B**.
4. Answer **ALL** the questions in Section **A** and **B** in the spaces provided.
5. All workings 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** | **STUDENT’S SCORE** |
| **A** | **1 - 13** | **25** |  |
| **B** | **14** | **12** |  |
| **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 opague object placed between them and the screen.

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Light Source Screen

. Opaque object

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

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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)

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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)

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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)

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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)

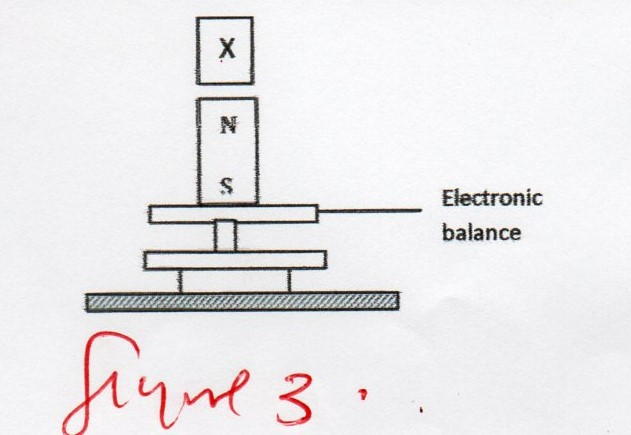


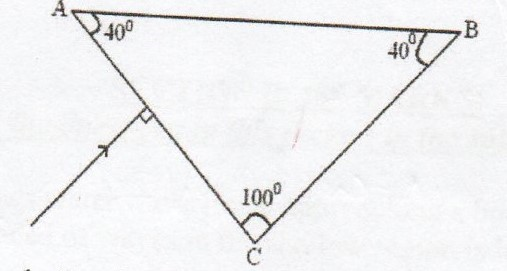
Figure 3

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

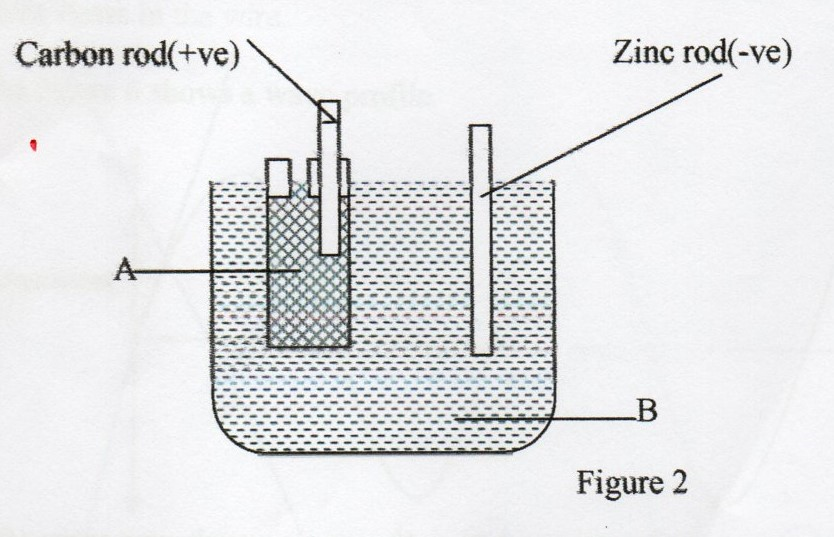
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7. The figure below shows a ray of light incident on a glass prism.



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

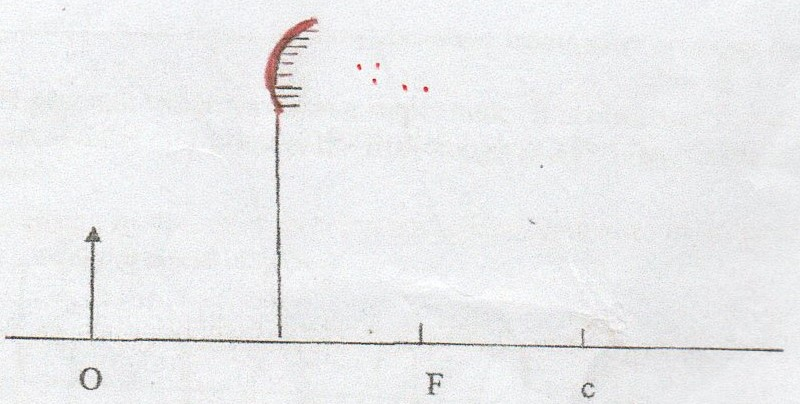
1. Figure 2 below shows a Leclanche’ cell



Name the chemical substances in the parts labeled.

A……………………………. (2 marks)

B ……………………………



Draw rays to locate the position of the image. (2 marks)

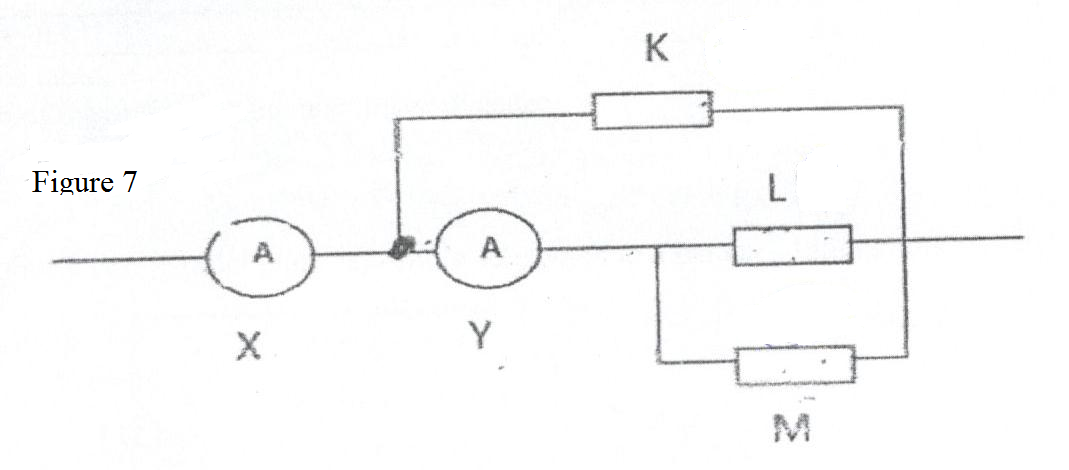
1. A plotting compass is placed above an insulated wire shown in figure 5

N S 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)

………………………………………………………………………………………………………………

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 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)



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

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

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**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 | 03 | 0.5 | 0.7 | 1.0 | 2.0 |
| Image distance,v,cm |  |  |  |  |  |

(a). Complete the table. (2 marks)

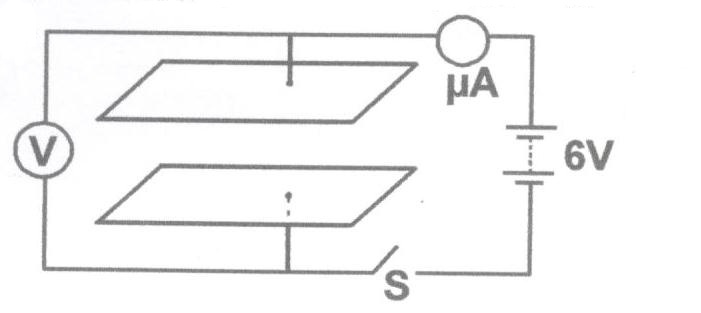
(b). Plot a graph of magnification against image distance (5 marks)



(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.

1. In the space below sketch a graph of current reading with time from time the switch is closed.

(2 marks)

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

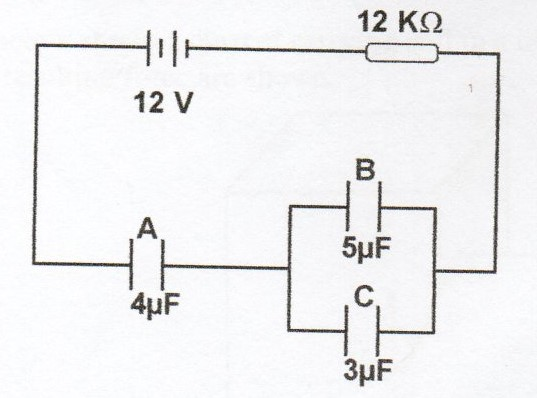
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1. How does the capacitance of the plates change when the plates are moved further apart?

(1 mark}

…………………………………………………………………………………………………………………………………………………………………………………………………………………………

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



Determine:

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

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

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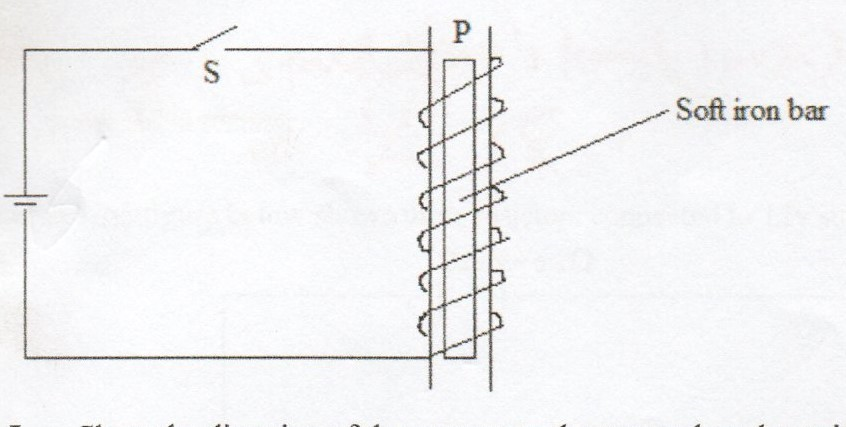
1. the total charge stored in the capacitors (3 marks)

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



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

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

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

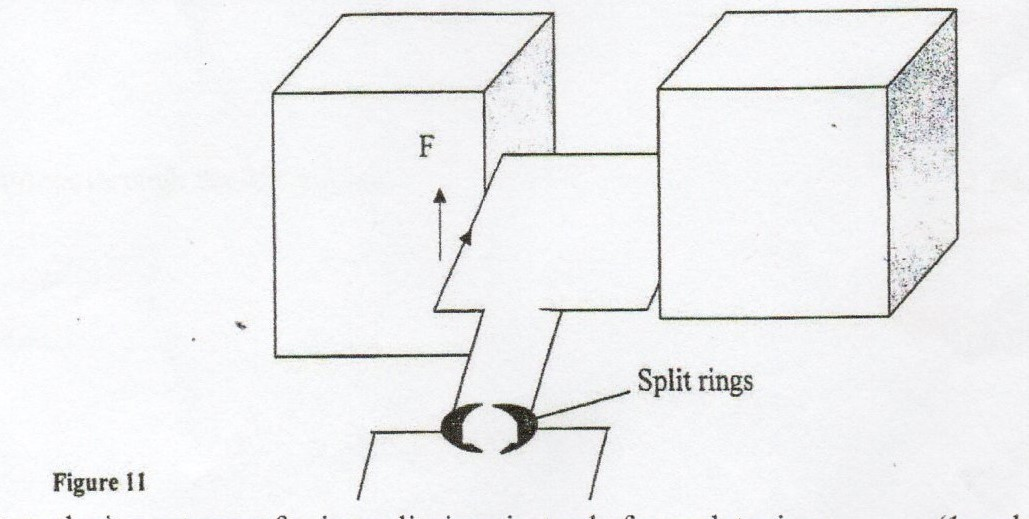
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1. If steel bar was used instead, what could be the difference? ( 1mark)

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



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

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

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

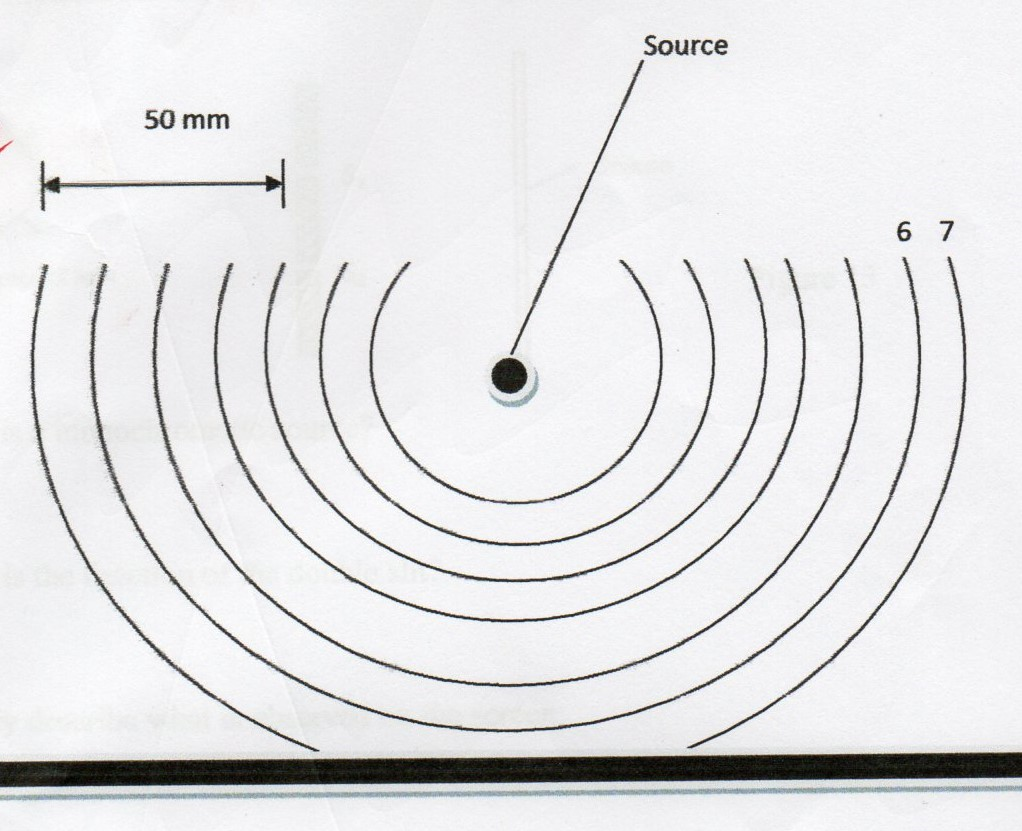
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(c). Give a reason why attraction in magnetism is not regarded as a reliable method of testing polarity of a magnet. (1 mark)  
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17. (a).(i). Copy and complete the diagram to show how crest 6 and 7 are reflected. (1 mark)



(ii). From the figure determine the wavelength of the water waves. (1 mark)

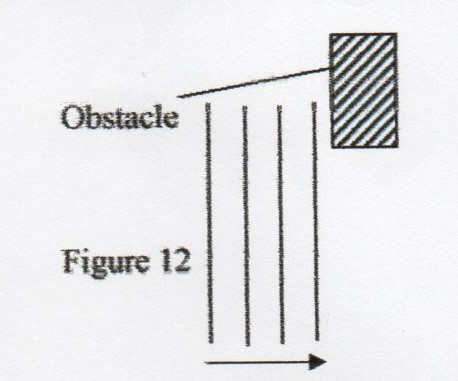
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(iii). Find the frequency of the waves if their speed is 60mm/s (2 marks)

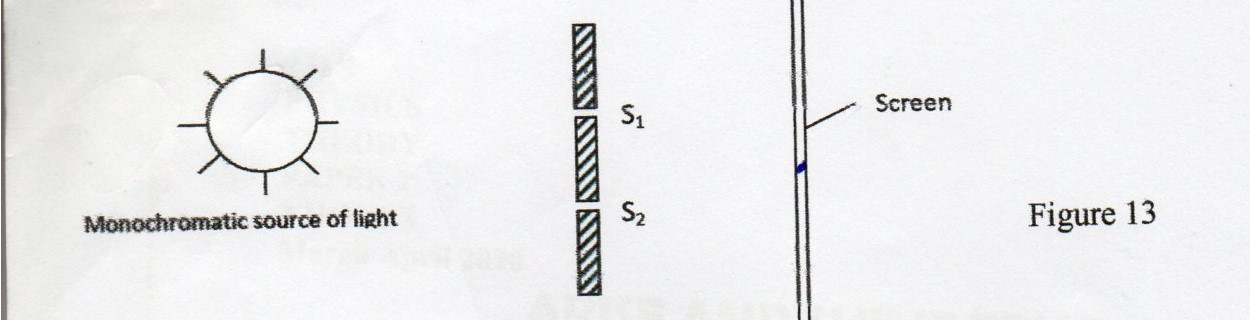
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(b). Figure 12 below shows wave - fronts approaching an obstacle. Complete the diagram to show the wave fronts as they pass the obstacle and beyond. (2 marks)



(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)

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

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

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

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

…………………………………………………………………………………………………………………………………………………………………………………………………………………………

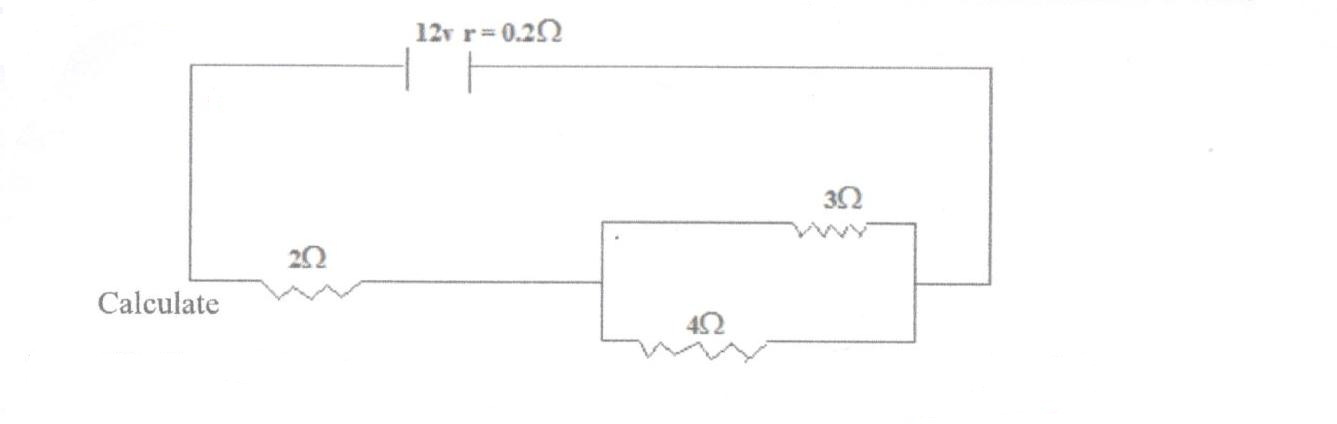
II. White light is used. (1 mark)

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18. (a). State ohm’s law (1 mark)

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



Determine:

I. the effective resistance. (3 marks)

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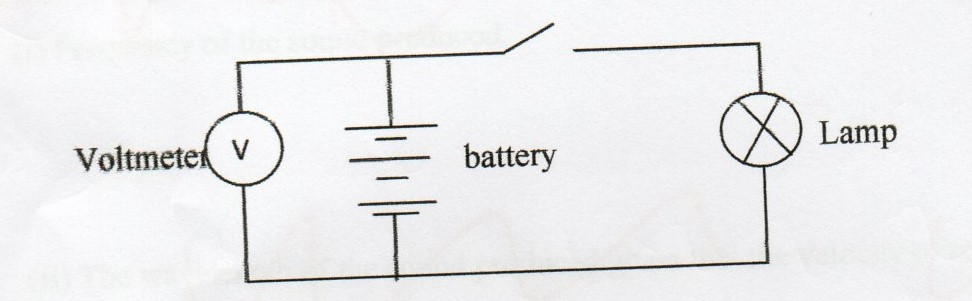
II. the total current in the circuit. (2 marks)

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III. The current through the 4Ω resistor. (2 marks)

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(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)

………………………………………………………………………………………………………………………………………………………………………………………………………………………………