Name: ………………………………………………………… Adm. No. ………………………………….

Date: ………………………………......................................... Candidate’s Sign. …………..........................

**232/2**

**PHYSICS**

Paper 2

September 2017

**TIME: 2 HOURS**

***Kenya Certificate of Secondary Education (K.C.S.E.)***

**Physics**

Paper 2

**INSTRUCTIONS TO THE CANDIDATES:**

1. *Write your* ***name*** *and* ***index number , date*** *and* ***sign*** *in the spaces provided****.***
2. *Answer* ***ALL*** *the* *questions in section* ***A*** *and* ***B*** *in the spaces provided.*
3. *All working* ***must*** *be clearly shown in the spaces provided.*
4. *Non programmable silent electronic calculator and KNEC mathematical tables may be used.*

**For Examiners’ Use Only**

|  |  |  |  |
| --- | --- | --- | --- |
| **SECTION** | **QUESTION** | **MAXIMUM SCORE** | **CANDIDATE’S SCORE** |
| **A** | 1-11 | 25 |  |
| **B** | 12 | 13 |  |
| 13 | 14 |  |
| 14 | 11 |  |
| 15 | 0 |  |
| 16 | 13 |  |
|  | 18 | 09 |  |
|  | **TOTAL SCORE** | **80** |  |

*This paper consists of 8 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.*

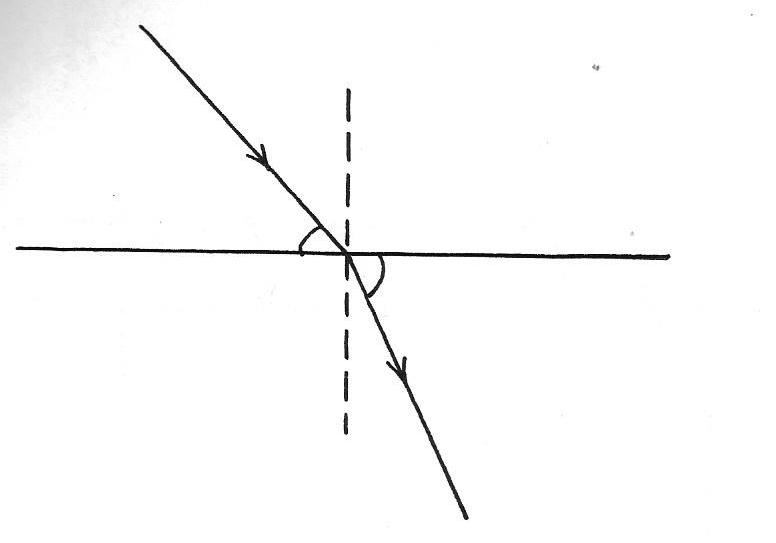
**SECTION A (25MARKS)**

***Answer all questions in this section.***

1. Convex mirrors are used in cars as driving mirrors because they have a wide field of view. Sketch a labelled diagram to show the wide field view (2mks)

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

2. The figure below shows a ray of lift travelling thorugh water and glass. The refractive index of water is 1.33



**Water**

**Glass**

**600**

**660**

Determine the refractive index (3mks)

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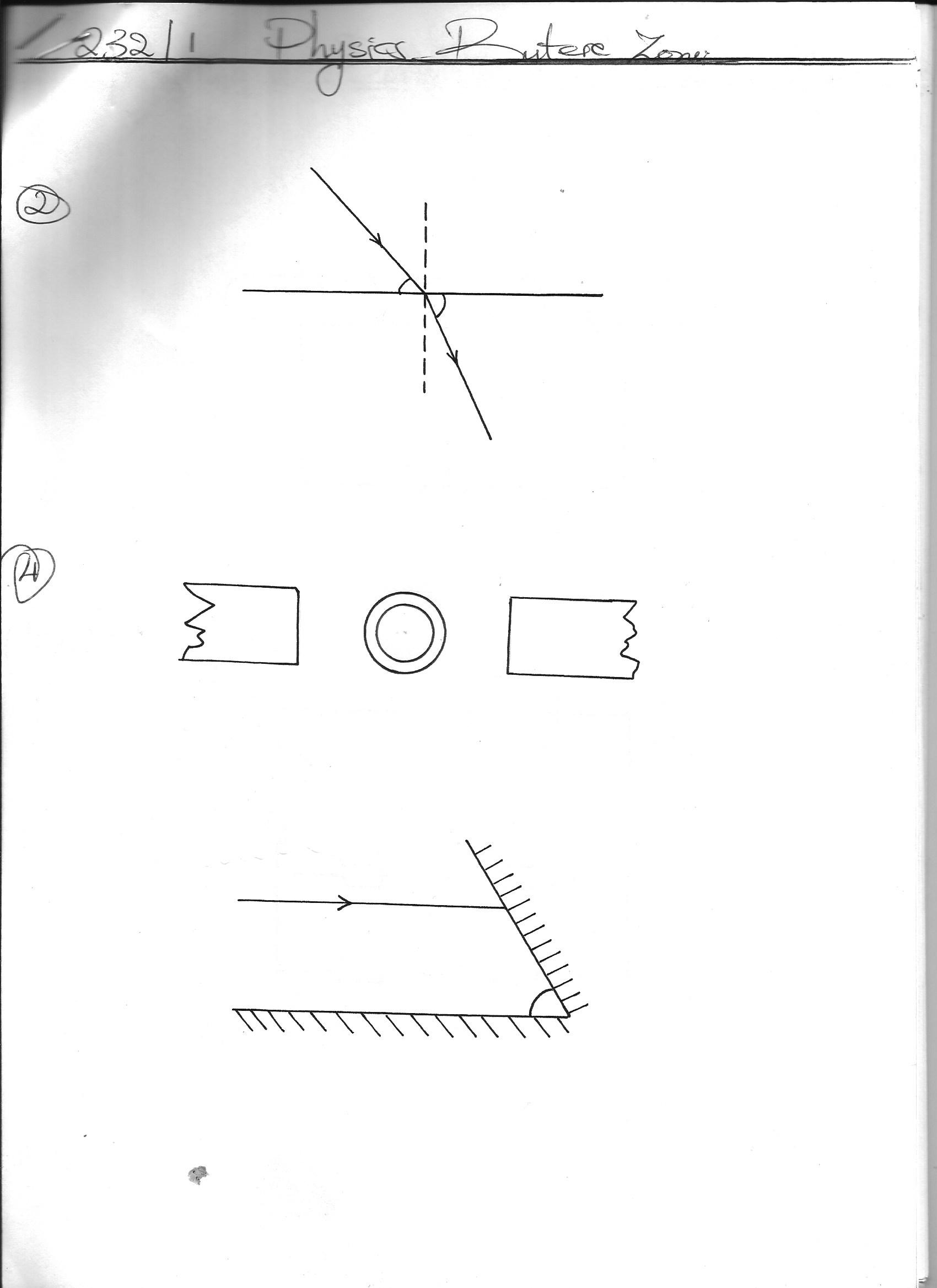
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3. A girl standing 600m away from a cliff bangs two pieces of wood together and hears an echo 3.5seconds later. Determine the speed of sound in air at that place. (3mks)

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4. Figure below shows a soft iron ring placed between two magnetic bars

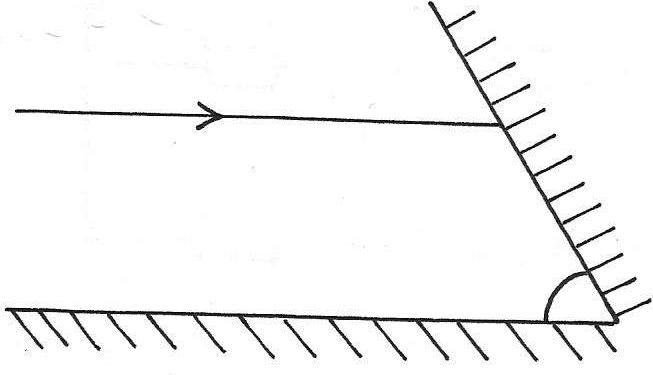


**N**

**S**

State **one** application where the principle above can be used. (1mk)

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

5. Two plane mirrors M1 and M2 are inclined to each other and a ray of light is shone on M1 as shown in the figure below

**450**

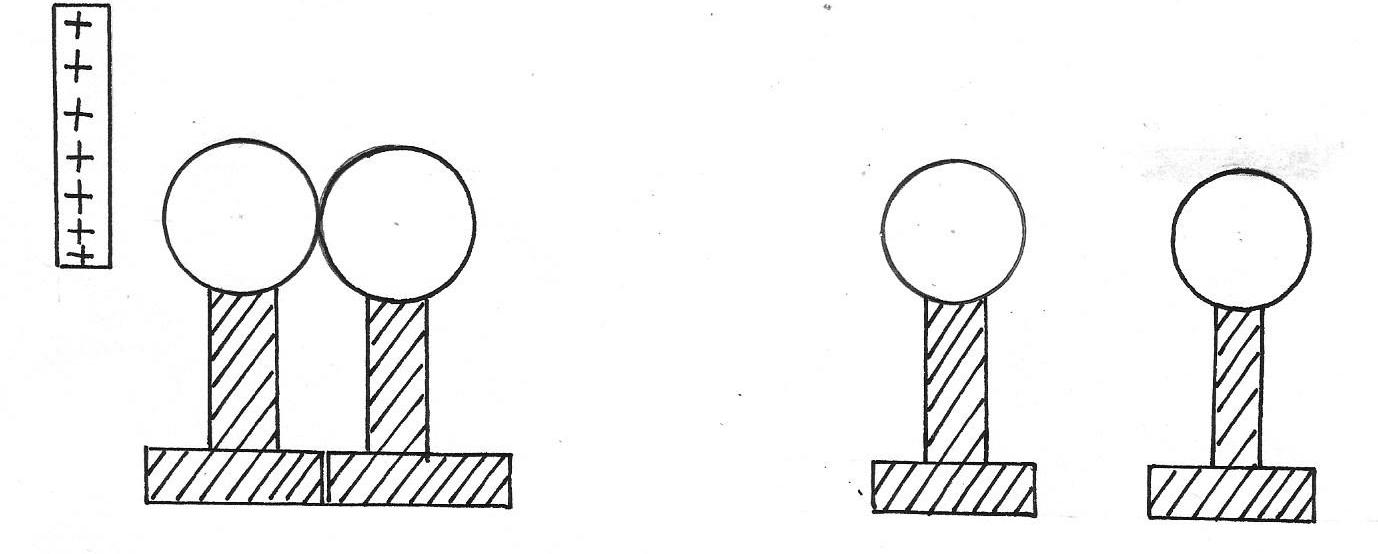
**M2**

**Ray of light**

**M1**

Show on the diagram the path followed by the ray until it reflected by **M2**  (2mks)

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

6. Two metallic spheres A and B stand in contact as shown. A positivity charged rod is held near sphere A- show the charges on each sphere when the metallic balls are separated and the rod is removed

**Insulated stand**

**Metal spheres**

**After separation**

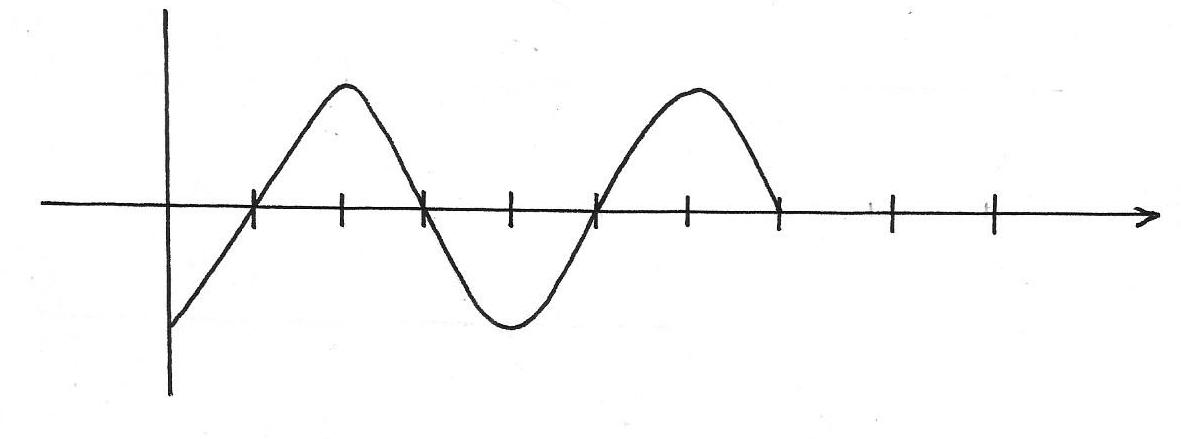
**A**

**B**

**A**

**B**

7. The wave shown in the diagram below has a velocity of 125m/s



**Time me x 10-2(s)**

**14**

**12**

**8**

**4**

Determine the wavelength of the wave (3mks)

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

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8. State two factor to consider for recharging an accumulator (2mks)

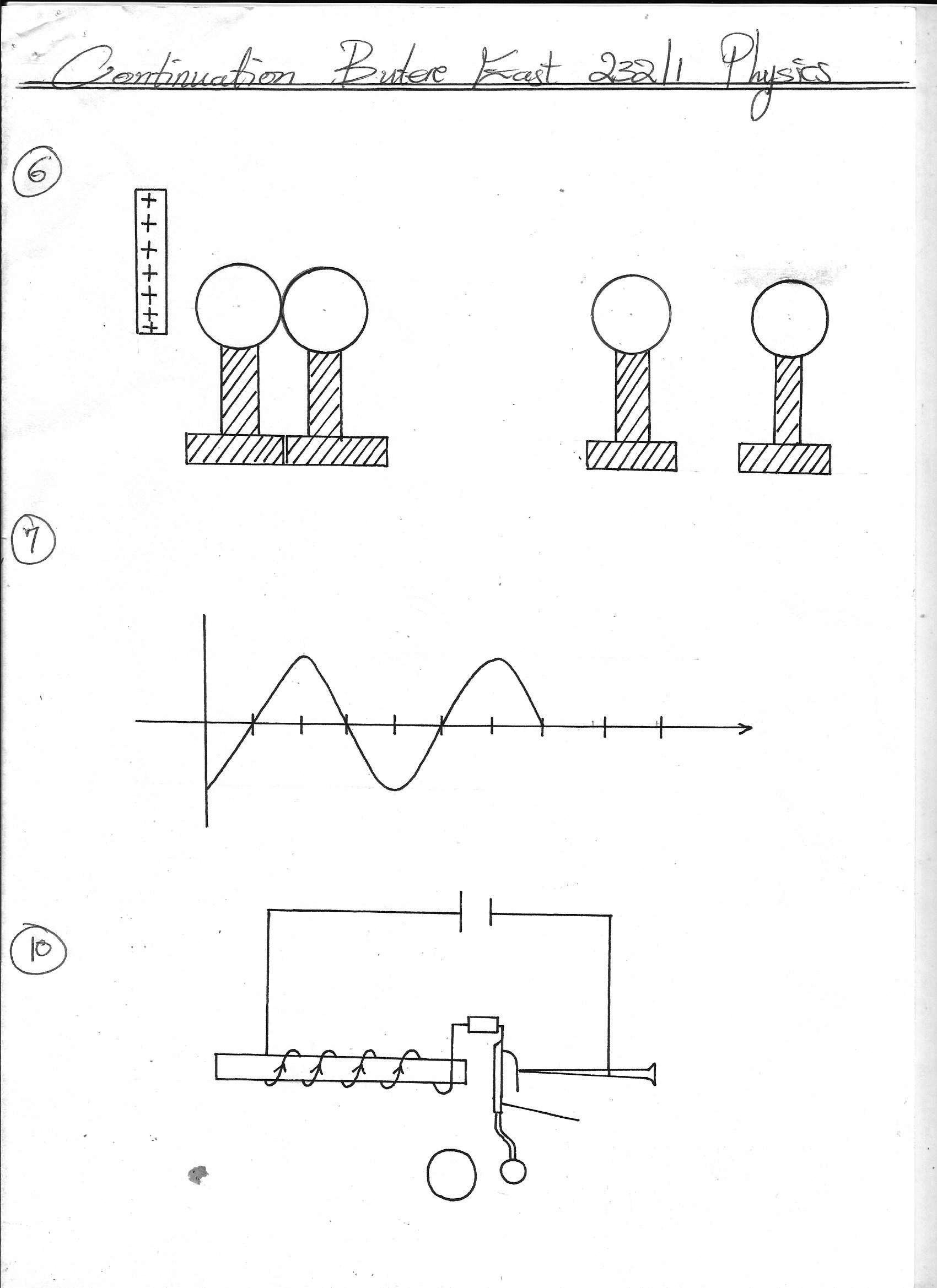
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9. Differentiate between electromotive force and potential difference (2mks)

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10. The figure below shows an electric bell

**Soft iron amature**

**Hammer**

**Gong**

**12V**

(a) Describe how the bell works (3mks)

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

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

(b) What adjustment should be done to the system to make it operate effectively with lower voltage battery? (1mk)

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

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

11. State the advantage of the lead acid accumulator over a lenchlanche cell (1mk)

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

**SECTION B(55MARKS)**

***Answer all questions in this section***

12. (a) (i) State the law of magnetism (1mk)

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

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

(ii) Repulsion is the surest test for polarity of a magnet. Explain (2mks)

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

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

(iii) State the difference between magnetic properties of steel and soft iron (1mk)

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

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

(iv) A steel bar was being magnetized by electrical method. It was noted that the strength of the magnet depended on the amount of current. The current was increased steadily until it was noted that the strength of the magnet could not increase further .Explain the observation (2mks)

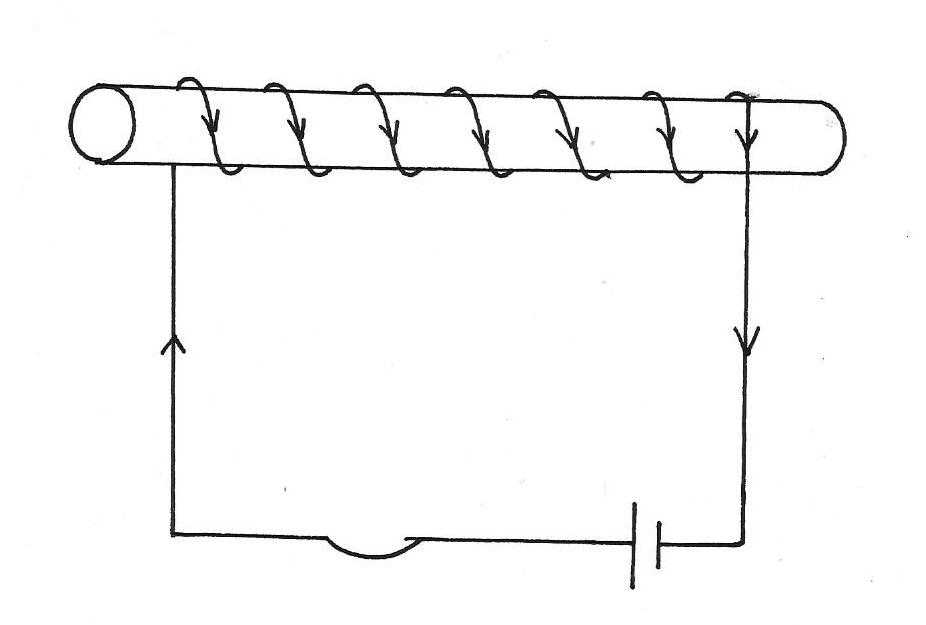
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(v) State **two** ways of demagnetizing a magnet (2mks)

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 (b) Study the figure below and answer the questions that follow

**Y**

**X**

**3V**

(i) Show, using arrows the direction of the electric current on the solenoid if the switch **S** is closed (1mk)

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

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

(ii) When the switch S is closed, the solenoid becomes magnetized. State the magnetic poles at

**X**…………………………………………………………………………………………………

**Y**……………………………………………………………………………………………….....

(iii) State **two** ways of increasing the strength of the electro magnet (2mks)

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

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

13 (a) State the Ohms law (1mk)

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

(b) In an experiment to determine the internal resistance of a cell, the following data was obtained

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Voltage (v)Vx 10-2 | 14.0 | 10.0 | 8.4 | 6.0 | 4.2 | 2.0 | 1.0 |
| Current (I) Ax 10-2 | 1.20 | 6.00 | 8.00 | 10.80 | 13.00 | 15.60 | 16.80 |

(i) Plot a graph of current against voltage (5mks)



(ii) From the graph, determine

(i). The internal resistance of the cell (3mks)

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

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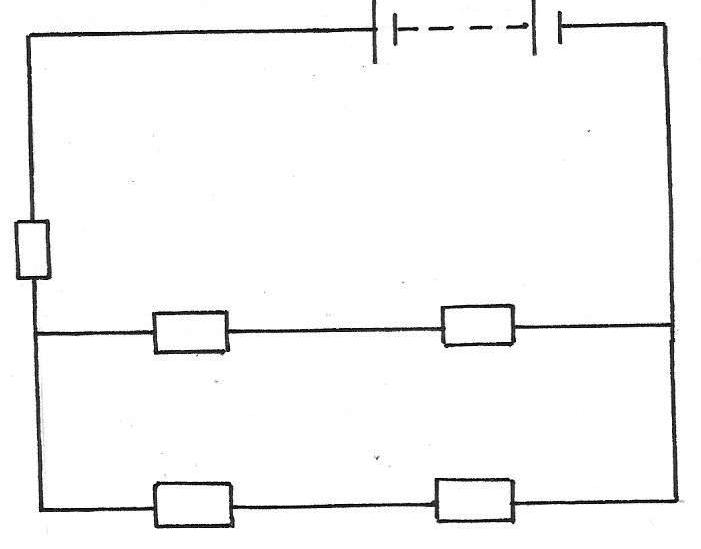
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(ii). The e.m.f of the cell (2mks)

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(c) The figure below shows five resistors connected to a **12V** supply.



**8Ω**

**16Ω**

**12Ω**

**4Ω**

**8Ω**

Calculate the effective resistance of the circuit (3mks)

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

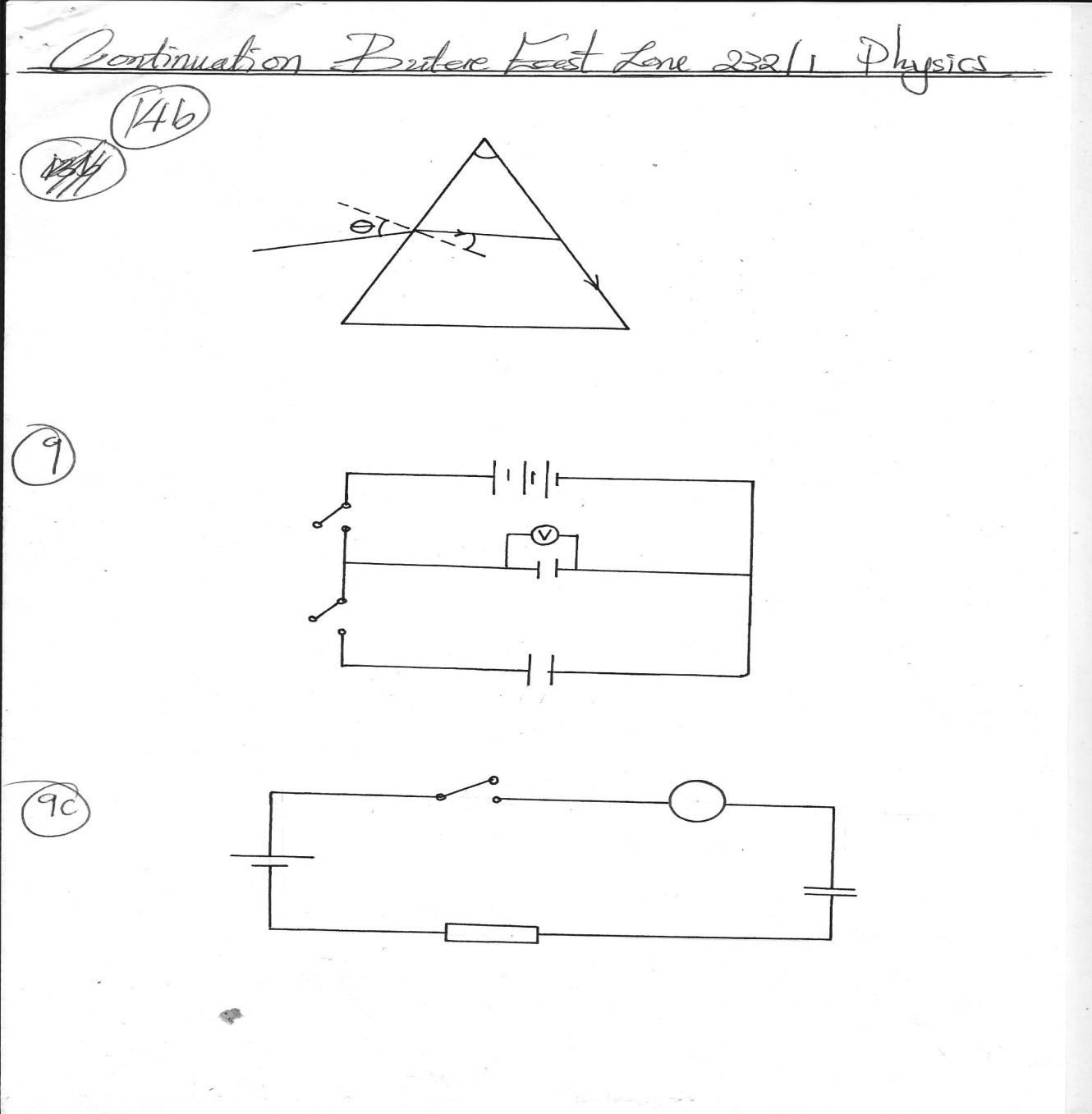
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14. (a) State the conditions necessary for total internal reflection to occur. (2mks)

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(b) The figure below shows light being refracted through glass. The velocity of light in a glass is1.88x 108 m/s

60o

**r**

(i) Determine the refractive index of the prism material (speed of light in vacuum,

C= 3.0 x 108 m/s) (3mks)

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

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

(ii) Show on the same figure above, the critical angle **C** and determine its value (3mks)

(iii) Given that r = 31.2o, Determine the angle its value (3mks)

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

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15. The figure below shows a circuit where battery of 4.5V, switches **A** and **B**, two capacitor C1=0.3F and C2 0.5 and a voltmeter are connected.

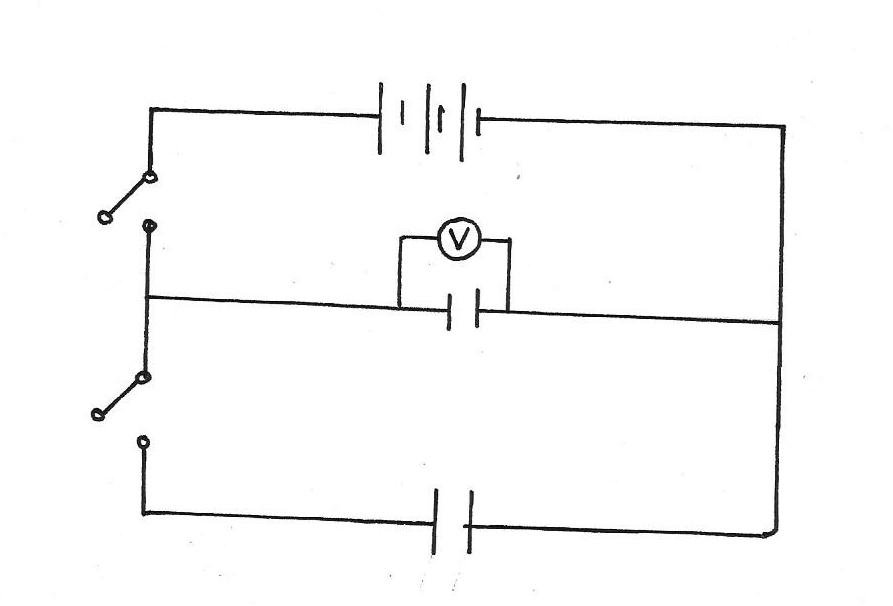
**4.5V**

**C1 =0.3F**

**C2=0.5F**

**A**

**B**



(i) Determine the charge on C1 when switch A is closed and switch **A** is closed and switch **B** is open (3mks)

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

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

(ii) What is the effective capacitance CT, of the circuit (1mk)

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

(b) State what is observed on the voltmeter in the circuit when ;

(i) Switch **A** is closed and switch **B** is open (1mk)

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

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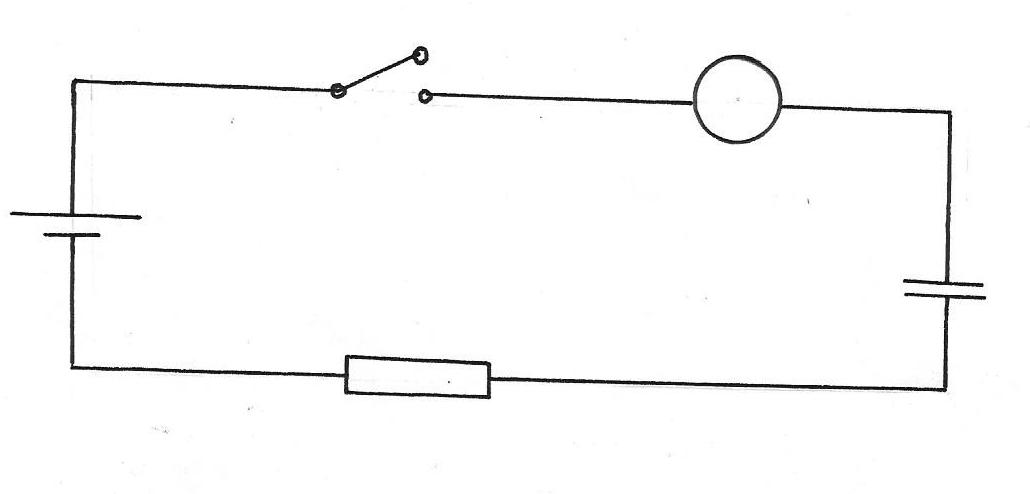
(ii) Switch **A** is closed and opened and then switch **B** closed (1mk)

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

(iii) Explain the observation made in (b)(ii) above (2mks)

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

(c) The following figure shows a circuit consisting of a resistor and a capacitor that may be used to charge a capacitor.



**C**

**5V**

**R**

**Switch**

**mA**

(i) State the observation made on the milliameter when the switch is closed. (1mrk)

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(ii) Explain the observation made in (c) (i) above. (2mrks)

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(d) The circuit in the figure is left on for some time

State the value of the p.d across

(i) The resistor **R** (1mk)

………………………………………………………………………………………………......

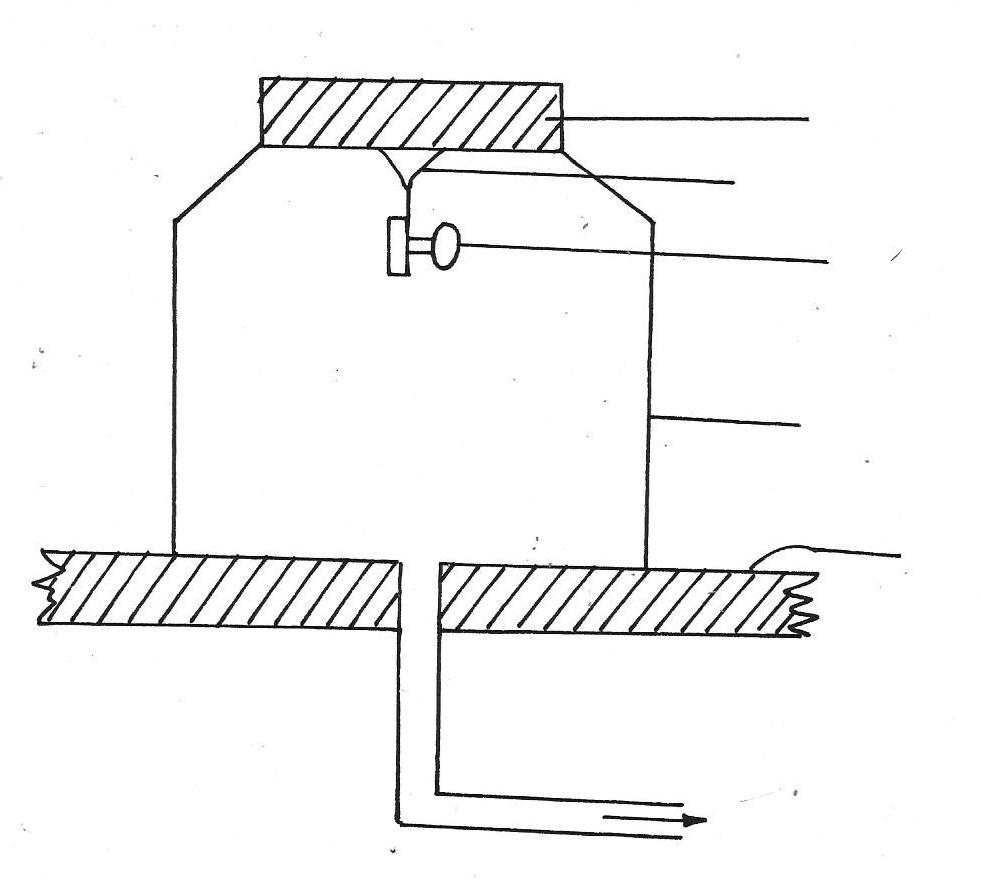
(ii)The capacitors **C**………………………………………………………………………………

16. (a) Differentiate between longitudinal and transverse wave (2mks)

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(b) The following diagrams shows a set up that was used to demonstrate that sound requires a material medium for transmission.



**Pump plate**

**Rubber stopper**

**Elastic support**

**Electric bell**

**Bell jar**

**To vacuum pump**

(i) State what happens to the sound from the electric bell as air continues to be shown from the bell jar (1mk)

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

(ii) What happens to the sound if some air is allowed back in to the jar (1mrk)

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(iii) Give possible reason why it is not possible to reduce the sound completely in this experiment (1mk)

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