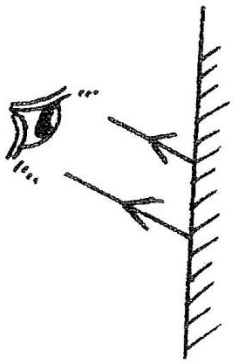
NAME ……..ADM NO……CLASS……
SCHOOL……

FORM 4 PHYSIC P2

SECTION A: 25 marks

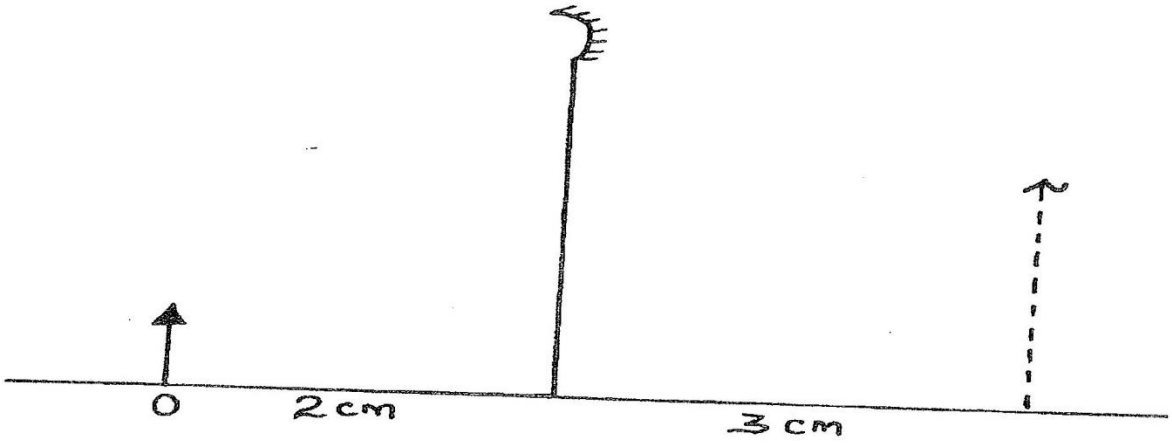
*Answer **all** questions in this section in the spaces provided .*

1. Figure 1 below shows reflected rays from a plane mirror.



By ray construction, show the position of the image and the object. (1 mark)

2. Figure 2 represents an object O and the image I formed by a concave mirror.



By suitable rays, determine the focal length of the mirror. (2 marks)

3. Two leaders A and B are rated as shown on the table belwo

	Heater A	**Heater B**
Resistance, ohms	RA	RB
Power, watts	W	3W
Voltage, volts	N	¼

Determine the ratio R_A: R_B (3 marks)

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4. **The figure** below shows the path of light through a transparent material placed in air.

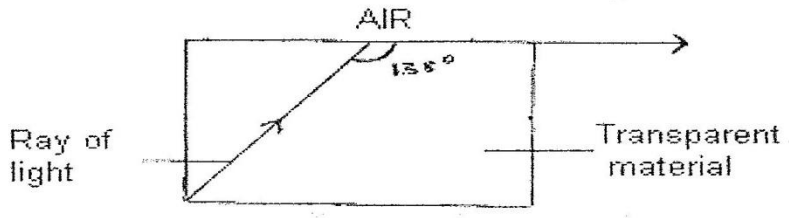

Fig.2

Calculate the refractive index of the transparent material. (3 marks)

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5. **Figure 4** below shows a highly charged needle bought near a candle flame

Fig.4

Explain why the flame burns in the direction shown (2 marks)

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6. Explain with an aid of a diagram why to a diver under water, most of the surface looks slivery. Bubbles of air rising from the diver look slivery. (2 marks)

7. Explain why soft iron keepers are suitable for storing magnets (2 marks)

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8. State **two** quantities that are used to determine whether accumulator require recharging or not.

(2 marks)

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9. Figure shows arrangement of three capacities of 10μF, 2μF and 5μF.

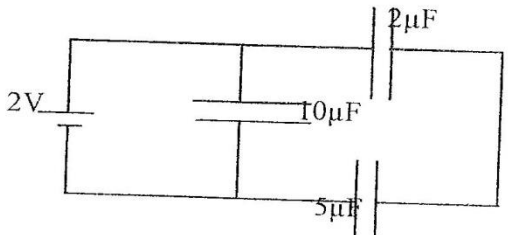

Figure 2

Figure 1

Determine the effective capacitance. (3 marks)

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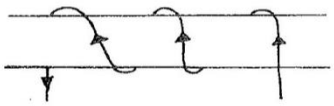
10. Sketch the magnetic field for a conductor shown in the figure below. (2 marks)



11. In a pin – hole camera, what is the effect of making the pin – hole small but square in shape?

(1 mark)

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12. An electric heater is rated 3KW what is the electrical energy in kWh (Kilo watt-hours) consumed by the heater when used on a 240V supply for 180 minutes? (1 mark)

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13. Briefly explain why in domestic wiring all the lamps in the house are connected in parallel

(1 mark)

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SECTION B: 55 marks

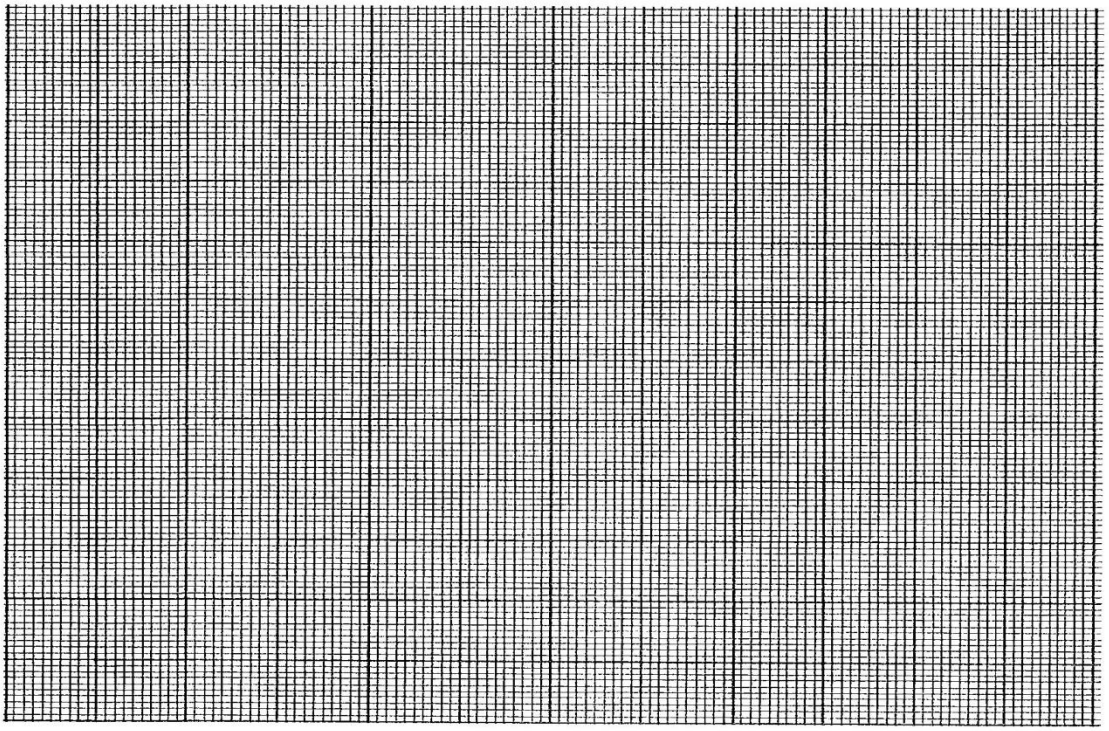
*Answer **all** questions in this section.*

14. (a) In an experiment with capacitor the charge stored was measured for different values of charging potential difference and the following results were obtained.

Charge stored (uc)	7.5	30	60	75	90
Potential difference (v)	1.0	4.0	8.0	10.0	12.0

(i) Plot a graph of charge stored (y-axis) against potential difference on the grid provided.

(4 marks)



(ii) Use the graph to determine the capacitance of the capacitor. (2 marks)

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(b) Resistors of 2Ω and 3Ω are connected in series with a cell and voltmeter connected across the 3Ω resistor reads 1V, but this increases to 1.2V when an extra 2Ω resistor is connected in parallel with the first 2Ω resistor, calculate the e.m.f and the internal resistance of the cell.

(4 marks)

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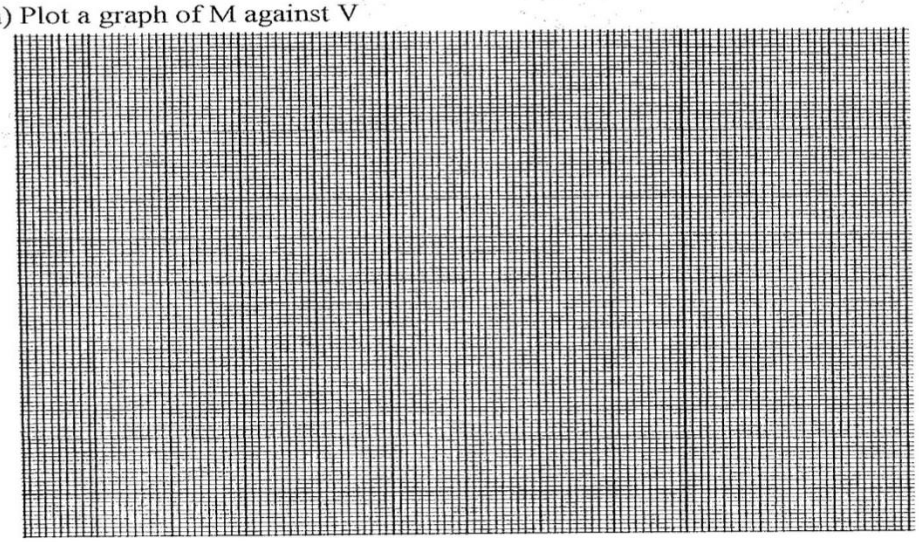
15. (i) The following data was collected to find the focal length of a convex lens.

Image distance, v	13.3	15.0	16.7	20.0	30.0
Magnification, M	0.3	0.5	0.7	1.0	2.0

(a) Plot a graph of M against V (5marks)



(b) Use your graph to find the focal length of the lens (3 marks)

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(c) Find the power of the lens (2 m arks)

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(d) State 4 similarities between the eye and the lens camera (4 marks)

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(e) What is long sightedness? (1 mark)

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16. State **two** differences between sound waves and electromagnetic waves (2 marks)

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(b) **Figure** below shows a waveform of a wave moving at velocity of 2m/s.

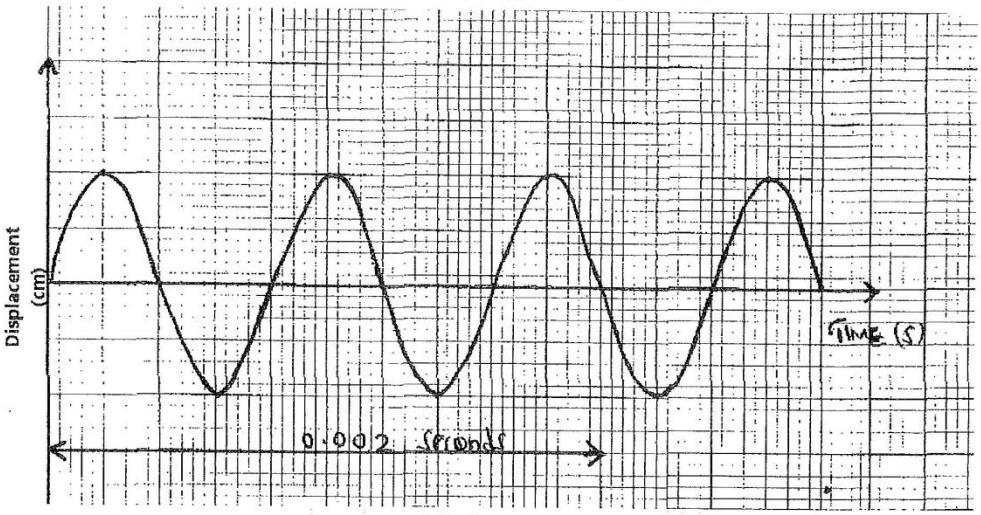

Fig.8

Determine:

(i) The periodic time (T) (2 marks)

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(ii) The wavelength (λ) (3 marks)

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(c) A fathometer produces sound in a ship and receives two echo's where there is a raised sea bed one after 2.5 seconds and the other after 3.0 seconds. Find the height of the raised sea bank if the velocity of sound in water is 1460m/s. (3 marks)

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17. A 10 μf capacitor is charged to a potential difference of 300V and isolated. It is then connected in parallel to a 5 μF capacitor. Find the resultant potential difference. (3 marks)

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(b) The energy stored before connection. (3 marks)

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(c) The energy in the **two** capacitors after connection. (3 marks)

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18. (A) State any one properties of magnetic flux lines. (1 mark)

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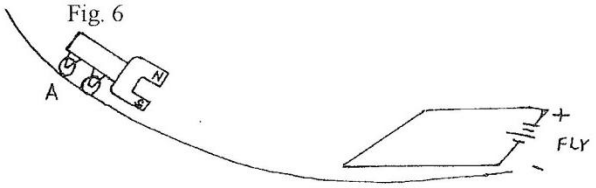
(b) A model railway truck has a magnet attached to it as shown in fig 6 below, not to scale. It is free to run on rails from a higher level A to a lower level B. At B, a thick loop of copper wire is placed horizontally across the track so that the magnet straddles the wire when the truck is at B. A large electric current passes through the wire, which is connected to a battery.
The truck is released from A and it rebounds without physical contact when reaching B.

Fig. 6



(i) Explain why the truck rebounds in this manner. (2 marks)

B

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(ii) Describe its subsequent motion. (2 marks)

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(i) What would be the effect of increasing the current through the wire, Explain (2 marks)

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(ii) What would be the effect of increasing the load in the truck ? Explain (2 marks)

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(v) What would be the effect of reversing the holes of the magnet? Explain. (2 marks)

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