SECTION A (25 Marks)

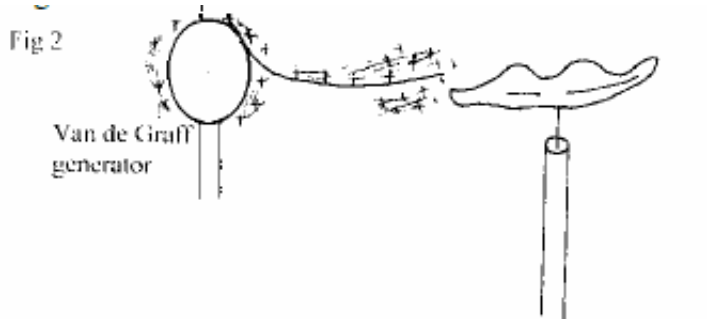
1. Figure 1 below shows a pin- hole camera and the image at an object formed in it.

Fig 1

a) Complete the diagram to show the object and the rays forming the image. Given that the magnification is 2. (2mks)
b) The image is 1.8cm high while the object is 3.0m in front of the camera. Calculate
i) The height of the object. (2mks)
.....
.....
.....
ii) Magnification (2mks)
.....
.....
.....

2. A lit candle is placed near the sharp point of a pin which is connected to positively charged atoms of a van de Graff generator is split into two directions when the generator is working as shown in the figure 2 below.

Fig 2



Explain the observation. (2mks)
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3. State one advantage of a circuit breaker over a fuse in a circuit. (1mk)
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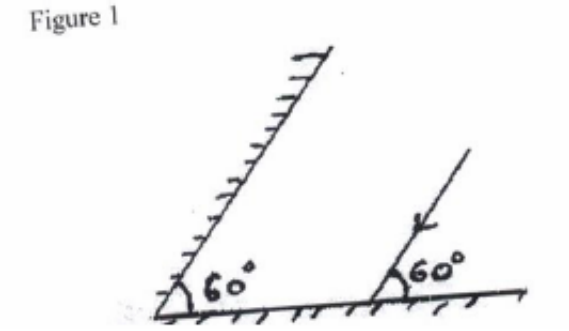
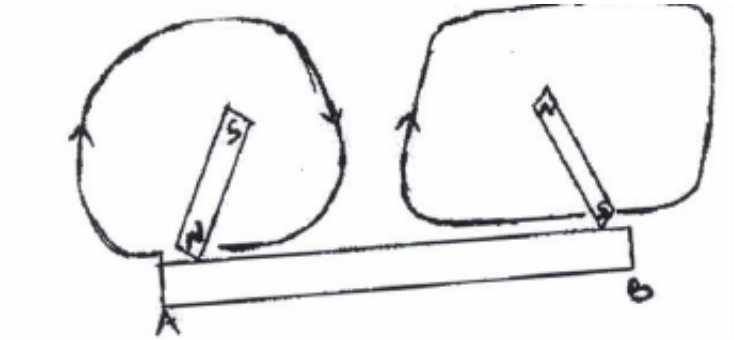
4. The figure below shows two mirrors inclined at an angle of 600 to each other. A ray of light is shone incident on one of the mirrors as shown.

Figure 1



Complete the diagram to show the path the ray follow until it leaves the two mirror- show all the angles at each reflection. (2mks)

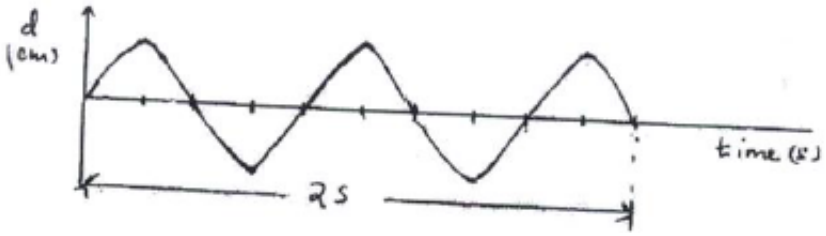
5. In an attempt to make a magnet, a student used double stroke method as shown below.



State the polarities of A and B. (2mks)
A.....
.....
.....
...
B.....
.....

6. The figure below shows a wave pattern

Figure 6



a) Determine the periodic time. (1mk)
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.
b) Hence calculate the frequency of the wave. (1mk)
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7. A mason is working between two vertical walls and at 120m from the nearest one. When he hits a brick he hears the first echo after 0.8s and the second one 0.5s later. What is the distance between the walls? (4mks)
.....
.....
.....
.....

8. State what is meant by polarization in a simple cell. (1mk)
.....
.....

9. Sketch a ray diagram to show the image formed when a convex lens is used as a simple microscope. (2mks)
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.....
.....

10. State Faraday's law of electromagnetic induction. (1mk)

11. Fig 2. Below shows a current carrying conductor, indicate the direction of current in the conductor hence the magnetic field pattern. (2mks)

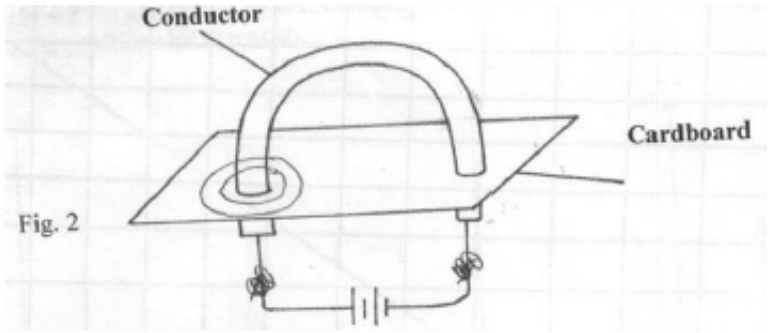
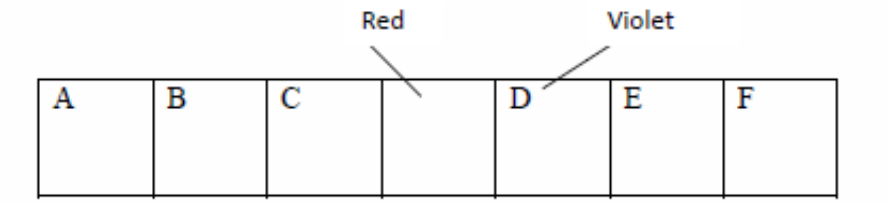


Fig. 2

12. The figure below shows some region of part of the electromagnetic spectrum.



i) Name the region that is detected by the blackened bulb thermometer. (1mk)
.....
ii) State one use of the EM wave in the region labeled B. (1mk)
.....
.....

SECTION B (55 Marks)

13.