

# END OF TERM 1 EXAMS

## PHYSICS

### FORM 3

#### PAPER 2

TIME: 1 & 1/2 HOURS

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

SIGN..... INDEX NO:.....

#### SECTION A: (25 MARKS)

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

1. State the laws of refraction (3 mks)

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2. a) Define local action (1mk)

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b) A charge of 4.8C flows through a lamp every second. Calculate the number of electrons involved per second. (3mks)

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c) Give two differences between a primary and a secondary cell (4mks)

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3. The figure below shows two mirrors  $M_1$  and  $M_2$  placed at angle of  $80^\circ$ . A ray of light incident to the mirror makes an angle of  $45^\circ$  with mirror  $M_1$ . Find the angle the ray turns after reflection in the two mirrors. (3mks)

4. A hockey player trains on a nylon fiber surface. As he runs around, his shoes rub against the surface and he becomes positively charged.

(i) Explain in terms of particles involved, how he becomes positively charged. (1mk)

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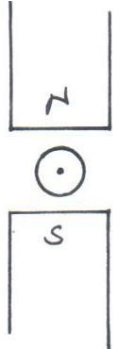
(ii) State what happens to the nylon-fiber surface as it becomes positively charged. (1mk)

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5. State **two** defects of a simple cell. (2mks)

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6. The diagram in figure 3 below shows a current carrying conductor placed in a magnetic field.

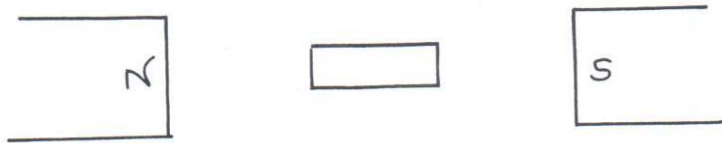


- (i) Sketch the resulting magnetic field pattern. (1mk)
- (ii) On the diagram show direction of force.

7. What is dispersion of light? (1mk)

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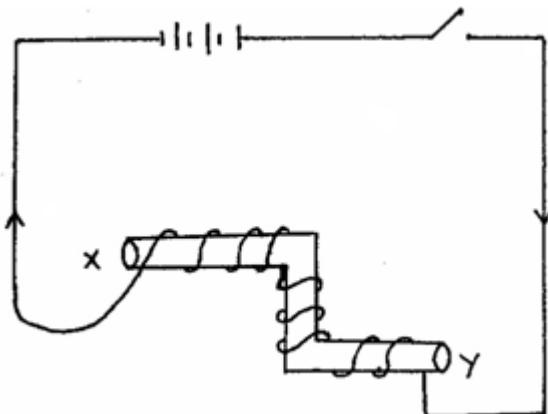
8. The figure below show a cubic rubber placed between two poles of a magnet. (1mk)



Complete the diagram to show the magnetic field pattern between the poles of the magnet. (1mk)

9. The diagram in figure 7 below shows one method of making a magnet.

Fig.7



What polarity is at **X** and **Y** when the switch is closed.

**X** = \_\_\_\_\_ (1 mark)

**Y** = \_\_\_\_\_ (1 mark)

**SECTION 11 (55 MKS)**

1yf3. A parent comes to you seeking your advice whether to use a white shawl or a black one to wrap her child to kept it warm. Which shawl would you advice to use and why? (2 marks)

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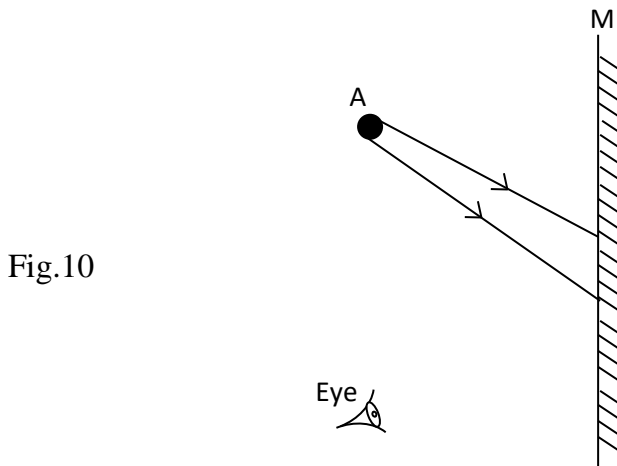
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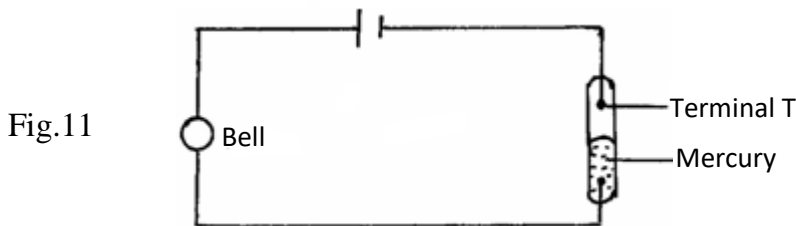
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Complete the figure **10 below** to show the position of the image of object A in the mirror M. (2 marks)



15. Figure **11** shows a fire alarm circuit.



Explain how the fire alarm functions. (3 marks)

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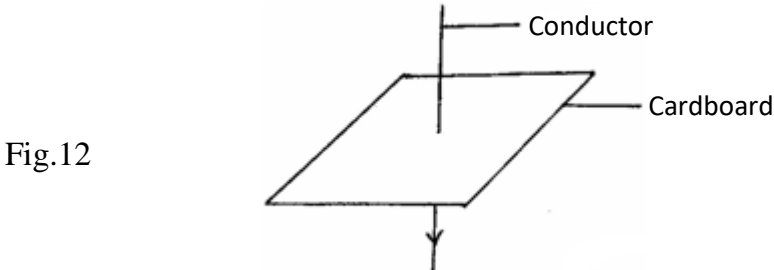
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16. A highly negatively charged rod is gradually brought close to the cap of a positively charged electroscope. It is observed that the leaf collapses initially and then diverges. Explain the observation.

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..... (3 marks)

17. In figure 12 the arrow indicates the direction of the current in the conductor. Sketch on the diagram the magnetic field pattern due to the current. (1 marks)



18. (i) In estimating the height of a tree, the following measurements were recorded:  
Height of the rod = 180cm.

Length of the shadow of the rod = 116cm  
Length of the shadow of the tree = 420cm  
Calculate the height of the tree. (3 marks)

(ii) State **three** methods of making magnets.

(3 marks)

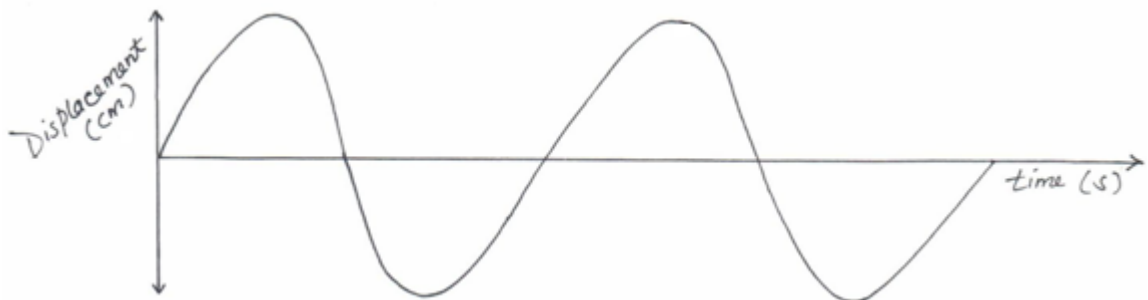
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20. 17. (a) Define an echo.

(1mk)

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(b) The figure below shows the displacement time graph of a wave.

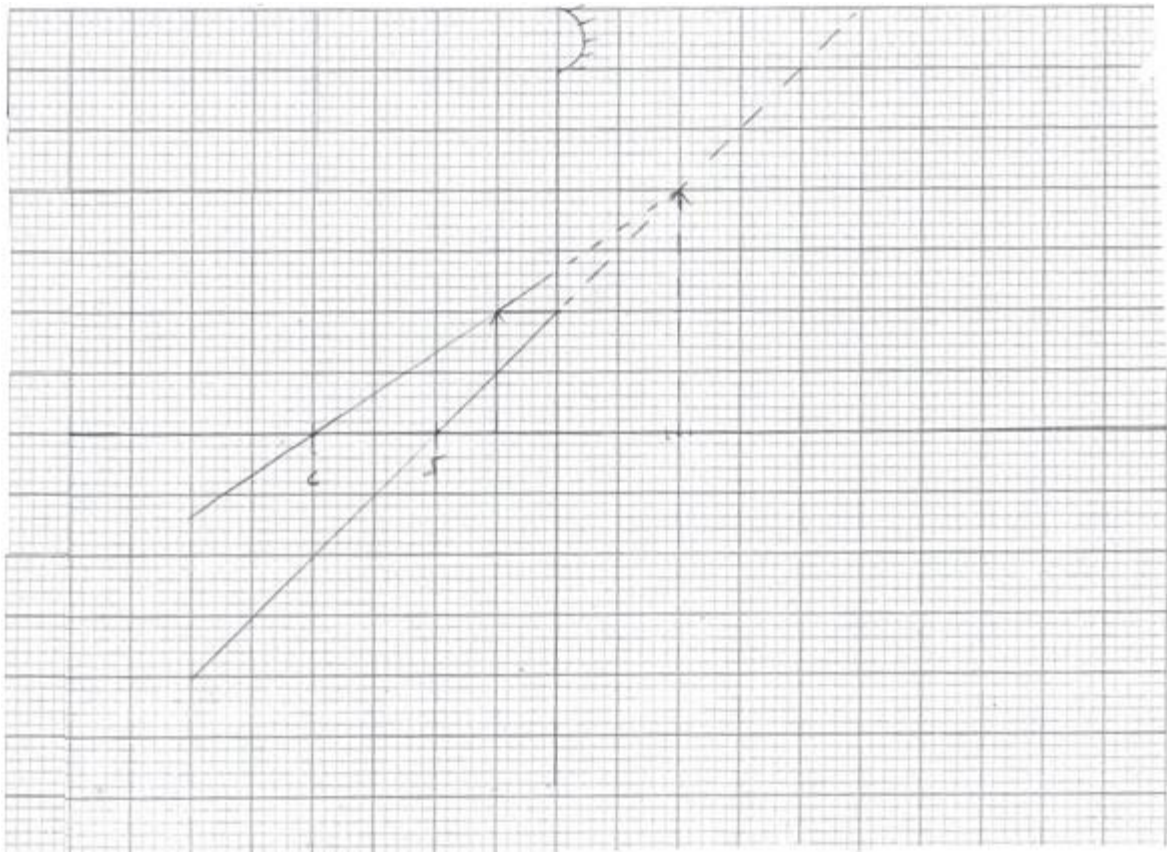


Sketch on the same axes a wave of twice the frequency and half the amplitude of the above waveform. (2mks)

(c) A hunter standing between two parallel cliffs hears a lion roar some distance away from him with the same valley. He observes the first echo after 1.5 seconds followed by the second echo after 2.8 seconds. If the hunter stands at equidistance from the first cliff, determine how far the lion is from the hunter. (Take speed of sound in air to be 332m/s). (3mks)

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18. The figure below shows an object placed in front of a concave mirror of focal length 10cm. C is the centre of curvature.



(a) On the same figure draw a ray diagram showing the location of the image. (3mks)

Use the ray diagram drawn in (a) above to determine the (1mk)

(i) image distance.

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(ii) magnification. (3mk)

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(b) A vertical object is placed 20cm in front of a concave lens of focal length 5cm.

Determine

(i) the image distance.

(3mks)

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(ii) the magnification

(2mks)

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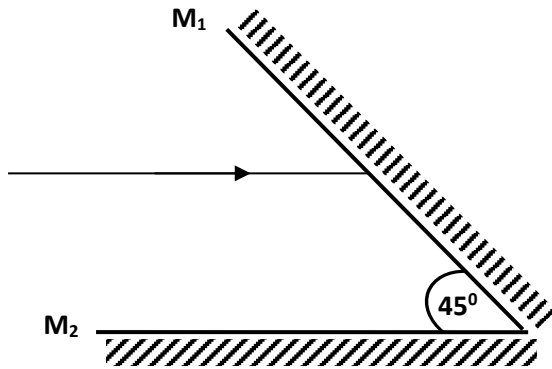
21. a) State the laws of reflection

(2mks)

b.) Two plane mirrors  $M_1$  and  $M_2$  are inclined to each other and a ray of light is shone on  $M_1$  as shown:

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Show on the diagram the path followed by the ray until it is reflected by  $M_2$  (2mks)

c.) Define the following terms as used in refraction (4mks)

i. Absolute refractive index

ii. Total internal reflection

iii. Critical angle

iv. Refraction

d.) i. Given that the refractive index of diamond is 2.42 and the velocity of light in air  $3.0 \times 10^8$  m/s, calculate the velocity of light in diamond. (3mks)

ii. A glass block of thickness 12 cm is placed on a mark placed on a plain paper. The mark is viewed normally through the glass. Calculate the apparent depth of the mark and hence the vertical displacement. (refractive index of glass is 1.5) (3mks.)

iii. State Snell's law of refraction. (2mks)

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1. a) Define magnification

(1mk)

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b) State two differences between a concave and a convex reflectors

(2mks)

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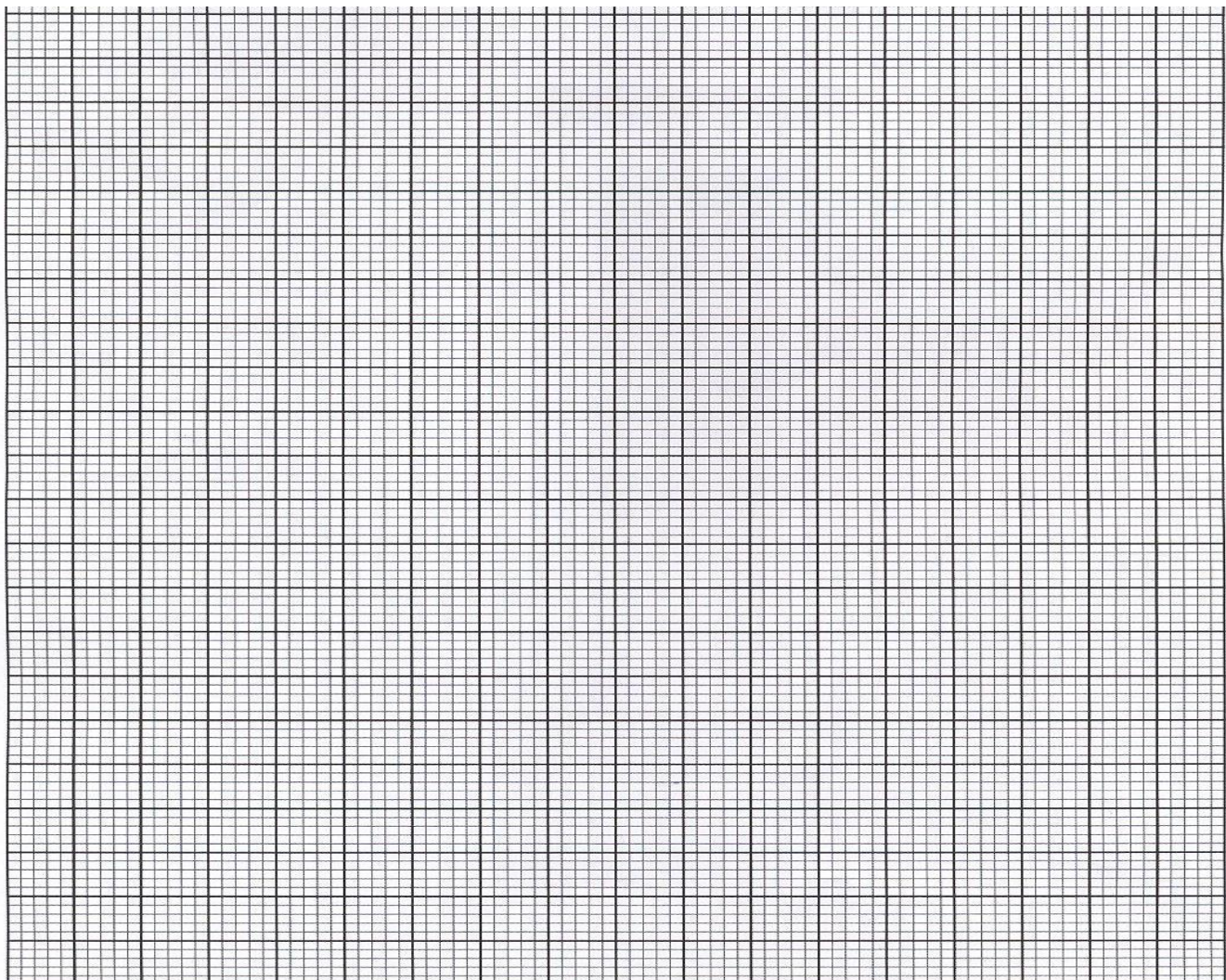
c) a concave mirror of focal length 20 cm forms a real image three times the size of the object. If the object height is 4cm; determine, using graphical method, the:

( i)object distance

(3mks)

(ii) The image distance

(1mk)



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