

NAMEINDEX NO.....DATE.....
SCHOOL.....SIGNATURE.....

PHYSICS

232/2

JULY/AUGUST 2010

2 HOURS

LAICOMET

232/2

PHYSICS

JULY/AUGUST 2010

INSTRUCTIONS TO CANDIDATES

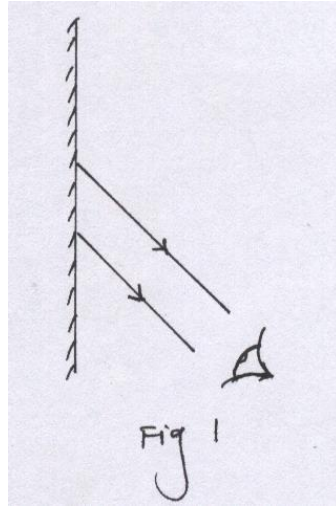
- ❖ Write your name and index number in the spaces provided above.
- ❖ This paper consists of **TWO** section :A&B
- ❖ Answer all the questions in the spaces provided.
- ❖ All working **MUST** be clearly shown
- ❖ Mathematical tables and calculators may be used .
- ❖ Take speed of light to be $3.0 \times 10^8 \text{ m/s}$

For examiners' use only

Section	Question	Max.score	Candidate's score
A	1 – 11	25	
B	12	11	
	13	10	
	14	12	
	15	10	
	16	12	
	TOTAL	80	

SECTION A (25 mks)

1. By ray construction, show they position of they image and object in they diagram below.
(3mks)



2. A plastic rod is rubbed with cotton and it is observed that the rod acquires a negative charge. The same cotton is brought near the cap of positively charged electroscope.

i State the observation made on the leaf of they electroscope. (1mk)

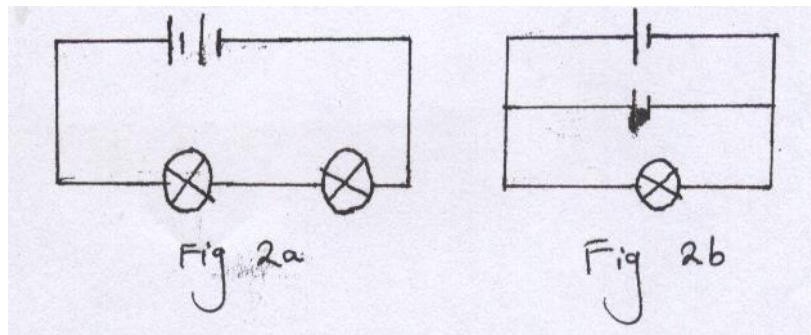
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ii Explain the observation (2mk)

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3. The diagrams in figure 2a and 2b below shows two circuits in which identical dry cells and identical bulbs are used.

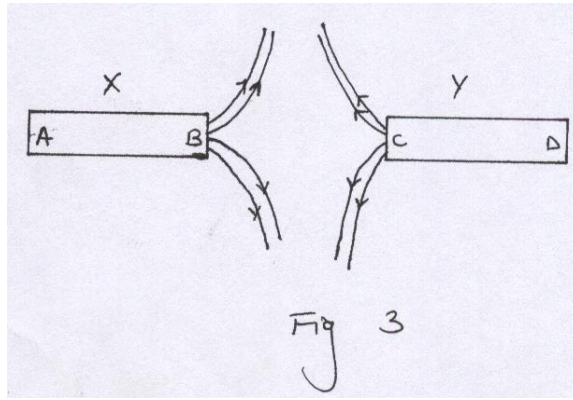


Explain why the bulb in fig 2b will be brighter than both bulbs in fig 2a.

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4. The diagram below shows two bar magnets X and Y and the magnetic pattern



i Identify B and C (1mk)

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ii State with a reason which magnet x or y is stronger (1mk)

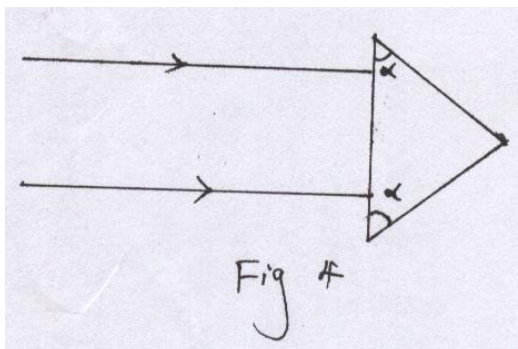
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5. An object is placed 15cm in front of convex lens of focal length 10cm. Calculate the image distance (2mk)

6. State two factors that affect the speed of sound in air (2mk)

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7. Two rays are incident on the base of a triangular prism whose angles are $\alpha = 30^\circ$ as shown in the figure 4 below. If the refractive index is $n = 1.414$, determine the angle between the two emergent rays. (3mks)



8. You are provided with three resistors of $352,2R$ and $10L$. Arrange the resistors in the circuit so as to have minimum resistance. Determine the effective resistance in the above circuit (3mks)

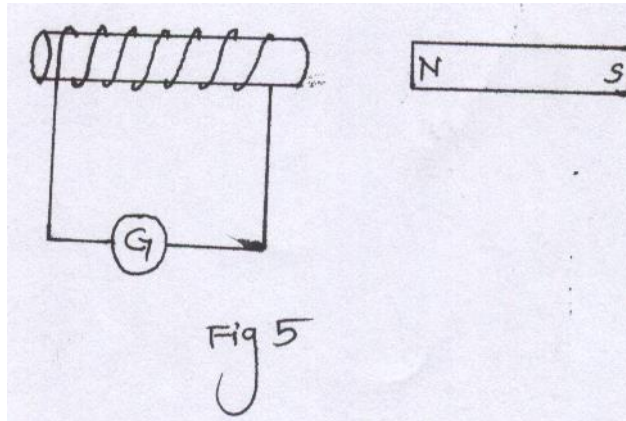
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9. State the two functions of a node in the C.R.O (2mks)

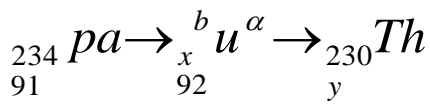
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10. The figure 5 below shows ends of a solenoid connected to a galvanometer as shown below and a magnet plunged into the coil.



Show the direction of induced current (2mks)

11. Complete the following nuclear reaction by identify the values of x and y . (1mk)



SECTION B (55MKS)

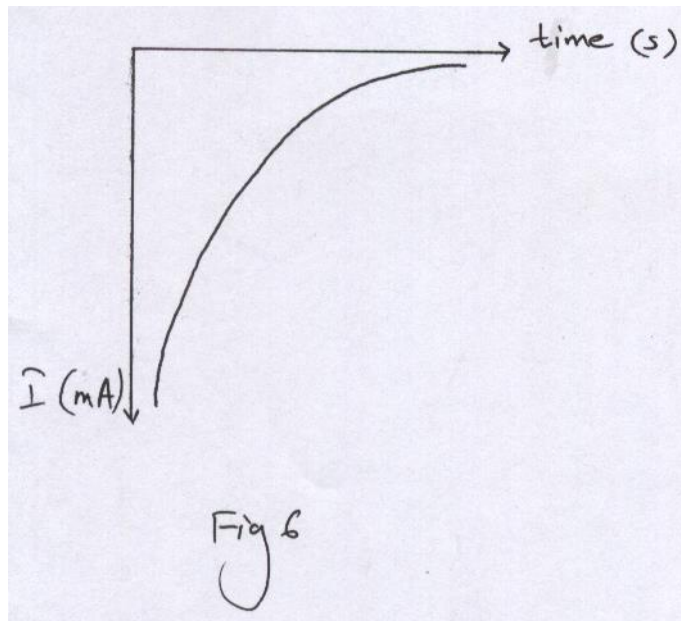
12. a Define capacitance of capacitor (1mk)

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b. State and explain two factors affecting capacitance of parallel plate capacitor (4mk)

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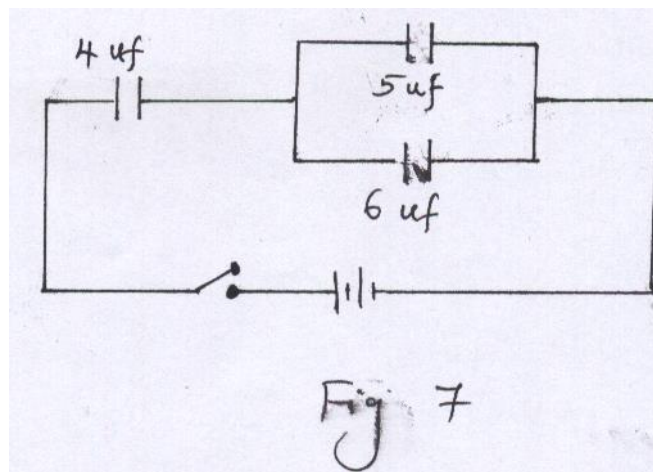
c. The graph shows the variation of current against time as the capacitor is being discharged



Explain the graph

(1mk)

- d. The diagram below shows 3 capacitors of 4MF , 5MF and 6MF connected to 12v d.c . supply



Find

- ii The effective capacitance

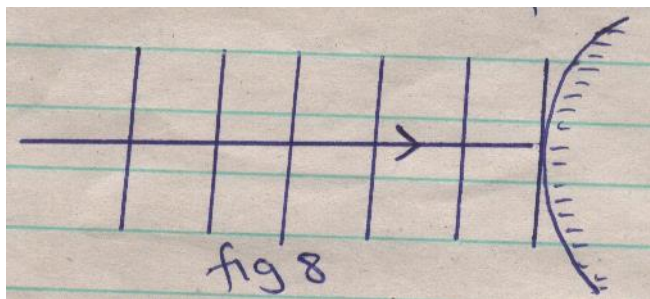
(3mks)

- ii The charge stored in the 4MF capacitor

(2mks)

13. a The figure 8 below shows straight wavefronts incident on convex reflector. Complete the diagram to show the reflected wavefronts.

(2mks)



b. Narrow slits cannot be used to demonstrate interference of sound waves. Explain (2mks)

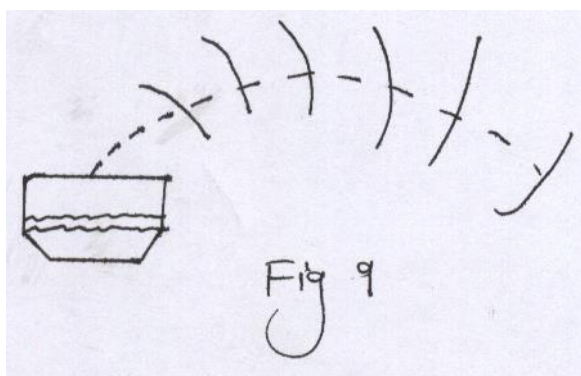
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c. The figure 9 below shows sound waves emitted by a drum struck .

Explain why the wavefronts are directed to the ground (2mks)

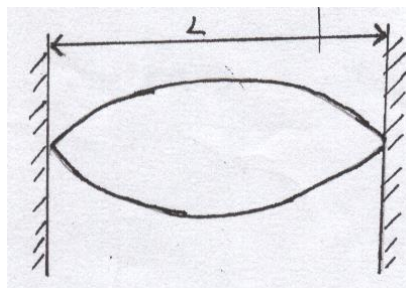


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d. The figure 10 below shows a vibrating string fixed at the ends.



If the vibration has a frequency of 200Hz and the wave velocity is 200m/s

Calculate

i Wavelength of the wave (2mks)

ii Length of the string

(2mks)

14. A metal surface is illuminated with radiations of different wavelength and kinetic energy of the photoelectrons ejected by each wavelength is recorded in the table below.

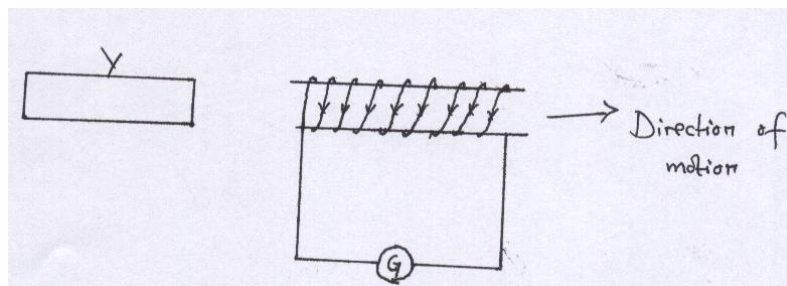
Wavelength of ($\times 10^{-9} m$)	415	387	368	345	325	315	
Energy ($\times 10^{-19} J$)	0.5	0.8	1.1	1.5	1.75		
Frequency of (Hz)							

- a. Complete the table by filling the frequency (3mks)
- b. Plot a graph of energy (y – axis) against frequency on the graph paper provided (5 mks)
- c. Use the graph to find
 - i Work function (1mk)
 - ii Planck's constant (1mk)
 - iii Stopping potential when wavelength is $31 \times 10^{-9} m$ (2mks)

15. a) State Lenz's law of electromagnetic induction (2mks)

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- b) A coil x is moved quickly away from the end of a stationary magnet y and current flows as shown in Fig.11



Show the polarity of y (1mk)

c) State the essential condition for emf to be induced in a conductor (1mk)

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d) A transformer has 800 turns in they primary winding and 40 turns in the secondary winding. The alternating emf connected to the primary is 240v and the current is 0.2 A

Find

i Secondary e mf (3 mks)

iiThe power in the secondary the transform if is 90%efficient (3mks)

16. a) A glass prism of refractive index 1.5 calculate the critical angle of this glass prism (3mks)

b) In an experiment to determine refractive index of water a black line is painted on the bottom of a tall glass container which is the partially filled with water. The black line appears closer than it is really .

The following results were recorded from the experiment

Real depth (cm)	8.1	12.0	16.0	20.0
Displacement (cm)	2.2	2.9	4.0	4.9
Apparent depth(cm)				

- i. Complete the table for apparent depth row (2mks)
- ii. Plot a graph of real depth against apparent depth on the grid provided (5mks)
- iii. Determine the refractive index for the water (2 mks)