NAME--ADM NO ------------------

CLASS ---------------------------- SIGNATURE -----------------------------------

PHYSICS 232/2

THEORY)

MARCH 2017

TIME 2 HOURS

<div align="center">

SUNSHINE SECONDARY SCHOOL

PRE-MOCK (I)

PHYSICS PAPER 2

</div>

INSTRUCTIONS TO CANDIDATES

Write your name, class and admission number in the spaces provided above.

This paper consists of two sections A (25 MARKS) and B (55 MARKS)

Working must be clearly shown

Non-programmable silent calculator may be used.

Take Acceleration due gravity, $g = 10 \text{Nkg}^{-1}$

SPEED OF LIGHT IN VACCUM, $C = 3.0 \times 10^8$ m/s

FOR EXAMINER'S USE ONLY

SECTION	QUESTIONS	MARKS	CANDIDATES'CSORE
A	1 -8	25	
B	9	08	
	10	08	
	11	06	
	12	11	
	13	06	
	14	10	
	15	06	
	TOTAL		

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SECTION A (25 MARKS)

1. a) State the law of electrostatic charges.   (1mk)

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    b) State two uses of a charged gold leaf electroscope.   (2mks)


    c) A conductor is slowly brought near the cap of a positively charged electroscope. The
    leaf collapses and then diverges.   State the charge on the conductor.   (1mk)

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2. A current of 1.5A flows in a circuit. Determine the quantity of charge that crosses a point
    in 5 minutes.   (1mk)

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3. Explain how polarization reduces current in a simple cell.   (1mk)

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4. a) Define focal plane as used in concave mirrors.   (1mk)

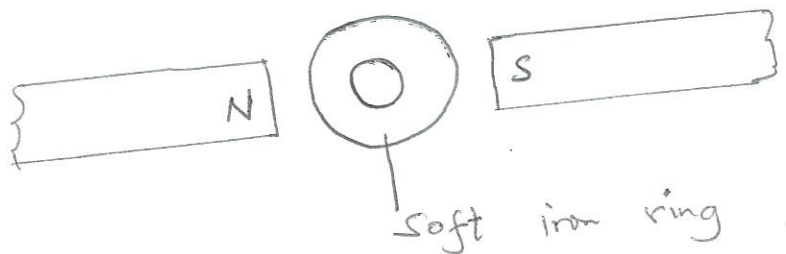   b) Complete the ray diagram below.   (2mks)

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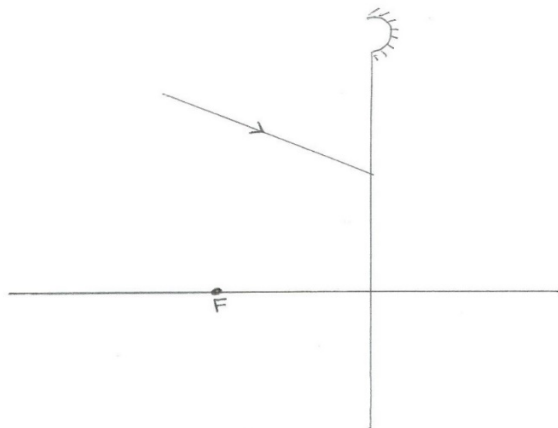
5. Determine the number of images formed when an object is placed between two plane mirrors inclined at 60°. (2mks)

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6. State one application of mirrors inclined at an angle. (1mk)

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7. a) Differentiate between magnet and magnetism. (2mks)

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b) Draw the magnetic field pattern of the arrangement shown below. (1mk)

c) Draw the appearance of the wave after passing an obstacle. (1mk)

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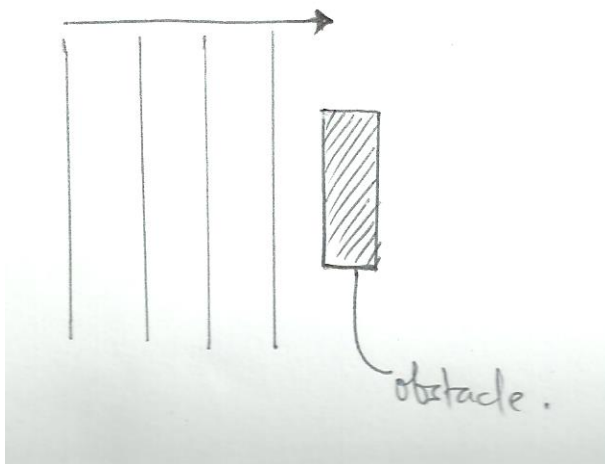
d) Give one use of this property of the soft iron ring. (1mk)

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8. a) State two characteristics of the image formed by concave mirror when the object is placed between the focal point (principal focus) and the pole of the mirror. (2mks)

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

i) Determine

I. The image distance (3mks)

II. the magnification (2mks)

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ii) State one characteristics of the image. (1mk)

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SECTION B (55 MARKS)

Attempt all the questions in this section.

9. a) Two points X and Y have a potential difference of V volts. Q coulombs of charge flows between X and Y for t seconds. Determine:
    i)   the electrical energy transferred between the two points in terms of Q. (1mk)
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    ----
    ----

    ii)   The power transformed in terms of Q and t.   (1mk)

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    iii)   show that the power transformed is given by $P = IV$ (2mks)

    ----

b) The lighting in a house has 20 lamps each rated 60W, 240V. Determine whether a fuse rated 4A can be used in the circuit when all the lamps are put one.   (4mks)

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10. a) State two conditions necessary for total internal reflection to take place.   (2mks)


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b) The diagram below shows a ray of light incident perpendicularly on a glass prism of refraction index 1.5. Determine the angle of deviation D. (3mks)
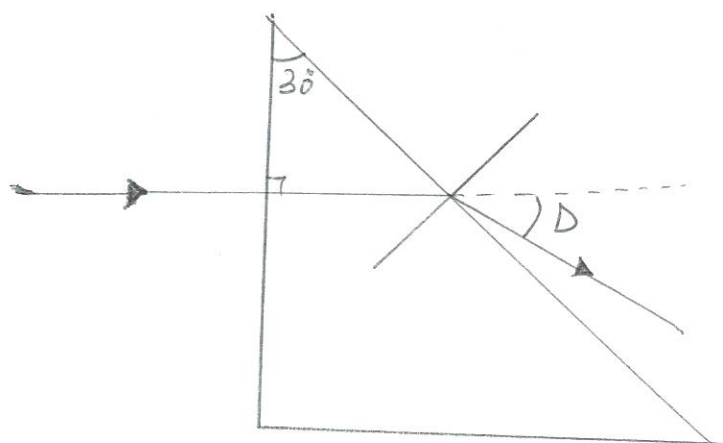
c) Draw a diagram to show how a ray of light can be made to turn through 90° using a glass prism. (1mk)

d) i) When light is reflected by a plane mirror, the angle of incidence is equal to the angle of reflection. State the other law of reflection on the mirror. (1mk)

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ii) Complete the path of a ray of light incident on two mirrors as shown.   (1mk)
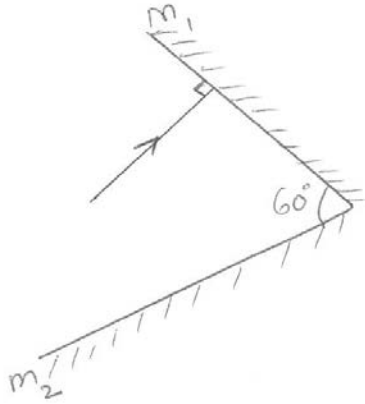
11. a) The diagram below shows an electromagnetic spectrum.

Radio waves	A	Infra – red	Visible light	B	x-rays	C

i)   State any one detector of A   (1mk)

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ii)   State any one use of B   (1mk)

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iii) State one way in which C is produced.   (1mk)

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b) A radio station transmits waves at 5MHz. Determine the wavelength of the
waves produced.   (3mks)

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12. a) State two factors that determine the magnitude of force between charged bodies.
   (2mks)

   ----

   b) Figure below shows a positive charge placed near a negatively charge red. Draw the
   electric field lines.   (1mk)

   c) Figure below shows capacitors A and B connected in series with a battery of e.m.f 6v.

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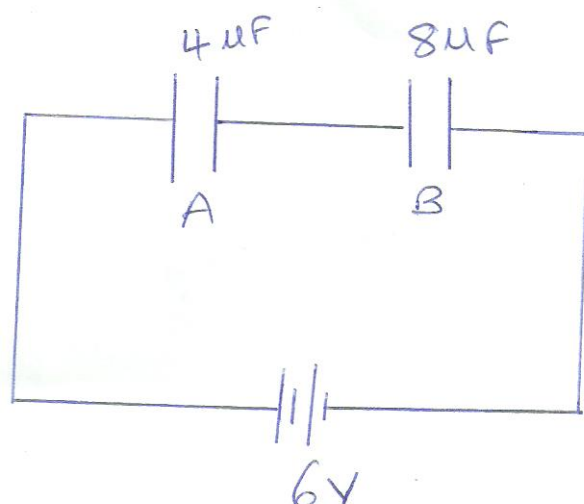
Determine the

i)   effective capacitance of the current   (3mks)

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ii)   Quantity of charge in capacitor A.   (2mks)

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iii) Voltage across capacitor B.   (2mks)

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d) State the effect of decreasing the distance between the plates of a parallel plate capacitor on the capacitance.   (1mk)

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13. a) Explain how keepers are used to effectively retain magnetic properties of magnets for a longer time.   (2mk)

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b) Use the diagram below to answer the questions that follow.
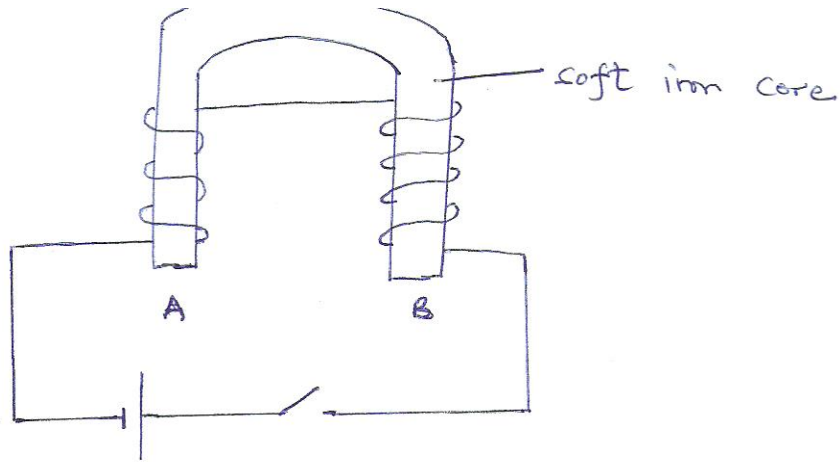
i)   Identify the method of magnetization above.   (1mk)

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ii)   In the same diagram indicate the direction of the flow of electric current. (1mk)

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iii) State the polarities:
      A -- (1mk)

      B -- (1mk)

iv)   Give a reason for your answer in (iii) above.   (1mk)

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14. a) Differentiate between progressive waves and stationary (standing) waves.   (2mks)

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b) The figure below shows this displacement time graph for a wave.
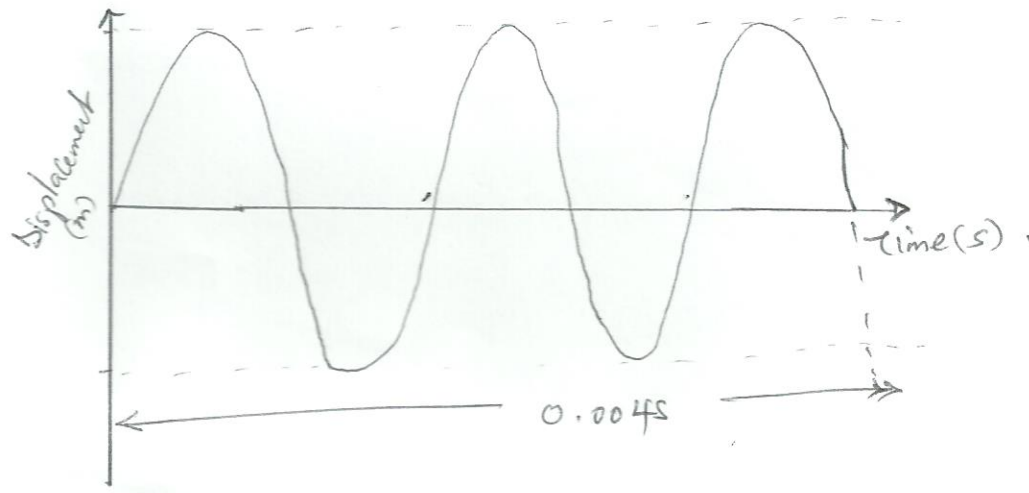
i) Determine the frequency of the waveform shown. (2mks)

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ii) On the same diagram draw a waveform of a wave whose frequency is twice and whose amplitude is half the one shown in the diagram. (1mk)

c) A fishing boat uses ultrasonic sound waves of frequency 8×10^{14}Hz to detect fish directly below it. Two echoes are received, one after 0.1s and the other after 0.12S. If the first echo was from a shoal of fish and the second from sea-bed which is 96m below the boat. Calculate:

I. Speed of sound (2mks)

II. Distance between the shoal of fish and the boat. (1mk)

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III.   Wavelength of sound waves.   (2mks)

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15. a) State ohm's law   (1mk)

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b) The cell in the figure below has an e.m.f of 2.0V and negligible internal resistance.
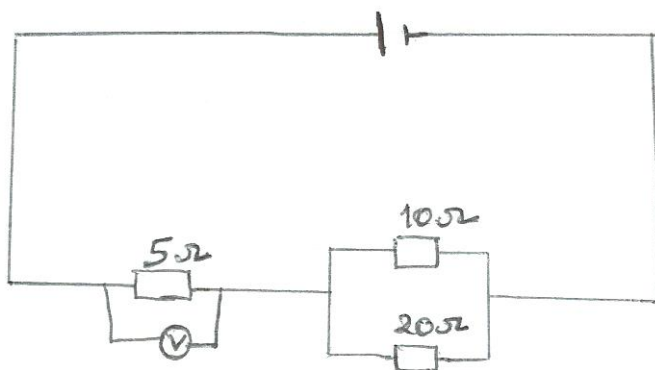
Determine the:

i)   total resistance in the circuit   (2mks)

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ii)   current in the circuit   (1mk)

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iii)   reading of the voltmeter   (2mks)

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