



North Sydney Boys' High School Science Department

YEAR 11 PHYSICS 2004

HALF YEARLY EXAMINATION

NAME _____

Physics Class _____

TEACHER : Please circle your teacher's name B.Balla Gow B.Gondek M.Hunnisett P.Maconachie

Answer all questions in the spaces provided.

Total Marks /40.

MULTIPLE CHOICE. Answer by selecting the alternative that best answers the question asked Each question is worth 1 mark

1. The energy that returns with an echo from a window, covered with fabric curtains

- A. is the same as the original wave
B. is less than the original wave
C. is more than the original wave
D. is impossible to measure

2. The potential difference between two points in a circuit

- A. is the change in potential energy per unit charge
B. will stay the same as the voltage varies
C. is not changed by an increase in current
D. is independent of the power source

3. When a current is sent through the coil in the direction shown

- A. there will be a north at both ends
B. the north will be on the right hand side
C. the north will be on the left hand side
D. there are no magnetic fields generated because it is a coil

4. The speed of this ray in medium Y would be

- A. 439 ms^{-1}
B. 204 ms^{-1}
C. 300 ms^{-1}
D. 390 ms^{-1}

5. A student measures the light intensity of a light globe at a distance of 2m and then at 4m When comparing the 4m intensity to the 2m intensity, she found that it

- A. dropped a little in comparison to the intensity at 2m
B. increased fourfold in comparison to the intensity at 2m
C. changed colour in comparison to the intensity at 2m
D. decreased to 0.25 of the intensity at 2m

6. How long would it take machine K to use up 100 joules of energy ?

- A. 2.1 seconds
- B. 2.8 seconds
- C. 4.8 seconds
- D. 21 seconds

7. Which series of radiation are in **descending** order of wavelengths ?

- A radio waves, infra-red waves, X-rays B infra-red waves, X-rays, radio waves
- C X-rays, ultra-violet waves, radio waves D radio waves, X-rays, infra-red waves

8. On a day when the speed of sound in air is 340ms^{-1} a musical note of frequency 85 cycles per second is played. What is its wavelength ?

- A. 0.25m B. 4m
- C. 28900m D. 8cm

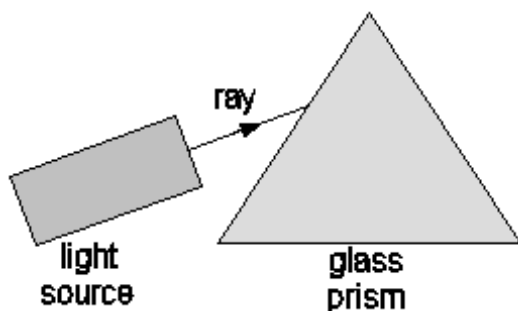
9. One way of reducing the electrical resistance of a wire would be to

- A. increase its length B. increase its width
- C. increase its temperature D. decrease its area

10. The function of a fuse in a circuit is to

- A. provide a back-up in case the main circuit breaks B. provide extra voltage to the circuit
- C. break the circuit when the current is too high D. break the circuit when the voltage is too high

11. In an experiment to determine the refractive index for the glass in a glass prism, a monochromatic light source was positioned such that it beamed a single ray of light into the prism.



A. Outline the experimental procedure you would use to determine the refractive index of the glass. 3 marks

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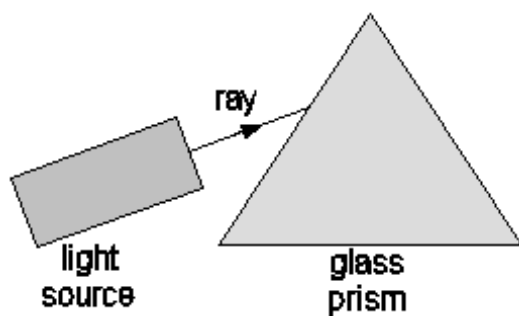
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B Draw the expected path for the ray of light on the diagram below

2 marks



C If the glass prism has a certain refractive index so that light travels at $\frac{3}{5}$ its speed when the medium is air, determine if the conditions are suitable for possible total internal reflection

1 marks

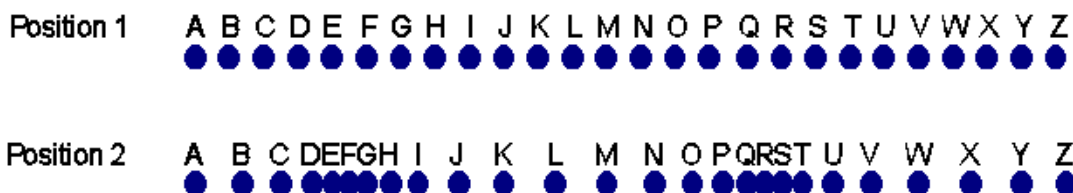
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12. The diagram below shows some particles. Position 1 shows the particles in the mean position. Position 2 shows the particles in their position as a compression wave passes through them to the right.



A. From the diagram, how many particles long is one wavelength. _____ 1 mark

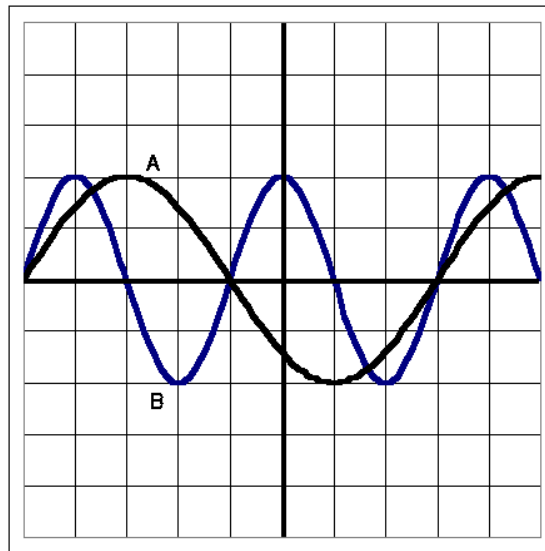
B. In what direction will M move in the next instant. _____ 1 mark

C. If there is 2 cm between each particle when they are in their mean position, and the wave is travelling at a speed of 30 ms^{-1} , determine the frequency of the wave. 1 mark

13 A positive point charge is 2 cm away from a negative point charge as shown in the diagram below. Draw a diagram to illustrate the electric field around the charges. 1 mark



14. The following diagram represents 2 different sound waves shown on a CRO.

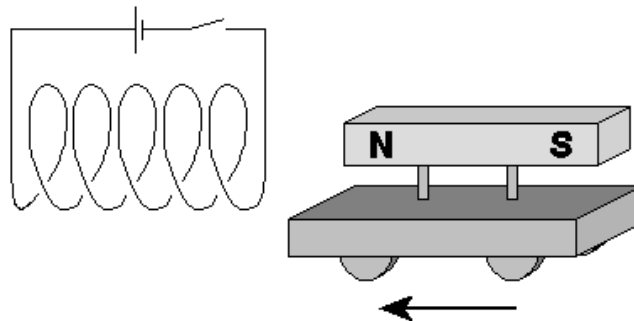


A. On the grid above, draw the superposition of these two waves 1 mark

B. Describe the difference that could be heard between the two waves A and B 1 mark

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15. A magnet on a trolley is pushed towards a coil of wire connected to a power source



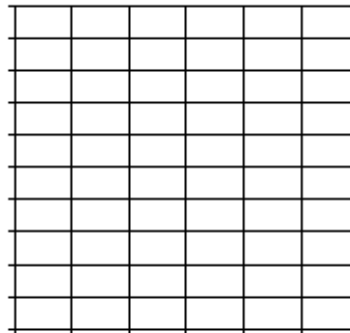
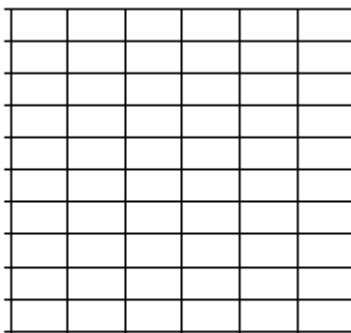
Describe what will happen if the switch is closed, as the trolley nears the coil ? 2 marks

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16. A student carries out an experiment using two resistors which she connects in series with a power supply. She measures the potential difference across each resistor and the current through the circuit and obtains the following results.

Resistor A		Resistor B	
Potential Difference (Volts)	Current (Amps)	Potential Difference (Volts)	Current (Amps)
0.0	0.0	0.0	0.0
1.5	3.0	1.5	3.2
3.0	6.2	3.0	6.3
4.5	8.9	4.5	8.5
6.0	12.0	6.0	10.2
7.5	14.8	7.5	11.1
9.0	18.0	9.0	11.3

A. Draw two graphs of potential difference against current. one for each wire. 2 marks



A. Explain whether either of these two resistors obeys Ohm's Law. 1 mark

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C. Determine the resistance for both of these conductors at 7.5 V. 2 marks

D. Determine the total current that will flow through these resistors when placed in parallel at 7.5 V 1 mark

17. The study in a house has one 240 V power point. The power point has an 8 A fuse. In the room are a number of appliances as well as a power board, which can connect 4 appliances to the one power point. The power consumed by each appliance is listed below.

Appliance	Power Consumption (Watts)
Lamp	100
Heater	2000
PC	150
Printer	100
Fax	30

A. If all the appliances except for the heater are connected onto the power board, will it exceed the maximum current? Give evidence for your answer 2 marks

B. Describe what will happen when the heater is connected to the power point. 2 marks

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18. The following diagram shows the energy rating for a dishwasher
 Discuss what information the energy rating label provides 3 marks

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19. Developments in technology involve many underlying physics principals. Discuss the physics principles involved in applications of current research in one of the following

Global Positioning System CD technology the internet (digital process) DVD technology

3 marks

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