



**ALEXANDER ROAD HIGH SCHOOL**

MARCH 2011

1 HOUR

**PHYSICAL SCIENCE CONTROL TEST**

MA, CO, KB, IC

TOTAL = 60

**GRADE 10**

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**Instructions**

- The question paper consists of 6 questions.
- Answer all the questions.
- Answer section A on the answer sheet provided AND section B on folio sheets.
- Rule off after each question in Section B.
- A non-programmable calculator may be used.
- Number the answers correctly according to the numbering system.
- A Data Sheet is provided for your use.
- Round off to two (2) decimal places where necessary.
- LO 2,3 AS 1,2 ,3

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**SECTION A**

- Answer on the answer sheet -

**QUESTION 1: One-word questions**

Give one word/term for each of the following descriptions.

- 1.1 The unit for the rate at which displacement is changing. (1)
- 1.2 The amount of energy that is transferred when 1 coulomb of charge moves from one point in an electrical circuit to another. (1)
- 1.3 The time taken for one complete wave to move past a particular point in a medium. (1)

**[3]**

**QUESTION 2: Multiple choice**

Four possible options are provided as answers to the following questions. Each question has only 1 correct answer. Choose the correct answer and make a Cross (X) over the letter (A – D) next to the relevant question number (2.1 – 2.6)

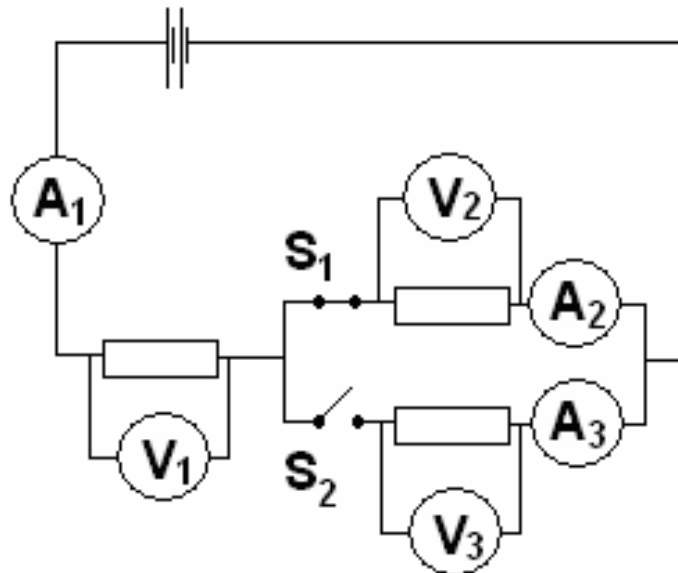
2.1 Which one of the following combinations will be a correct classification of acceleration and initial velocity **as** scalar or vector quantities?

	<b>Acceleration</b>	<b>Initial velocity</b>
A	scalar	scalar
B	vector	scalar
C	scalar	vector
D	vector	vector

2.2 Which of the following factors DOES NOT affect the resistance of a conductor?

- A. Length of the conductor.
- B. Density of the conductor.
- C. Temperature of the conductor.
- D. Thickness of the conductor.

2.3 Consider the circuit below...



Initially, only switch  $S_1$  is closed then switch  $S_2$  is closed. How do the readings on the following ammeters and voltmeters change once  $S_2$  is also closed



## SECTION B

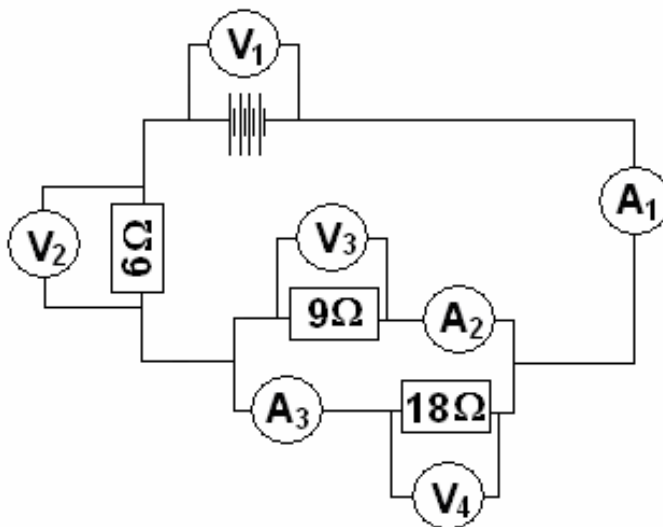
### QUESTION 3 ( Mechanics)

3. An aircraft comes to land on a runway. The runway is 1600m long. It touches down (lands) 100m from the front end of the runway and continues at a constant speed for 140m for 2s before hitting the breaks thus accelerating uniformly at  $4 \text{ m.s}^{-2}$  which results in it coming to rest.
- 3.1 Calculate the velocity of the aircraft for the first 2s on the ground. (3)
- 3.2 Is the acceleration positive or negative? Give a reason. (2)
- 3.3 Calculate how far the aircraft stops from the other end of the runway. (6)
- 3.4 Name one factor that can affect the aircraft taking longer to slow down. (1)

**[12]**

### QUESTION 4 (Electric circuits)

Consider the circuit below...



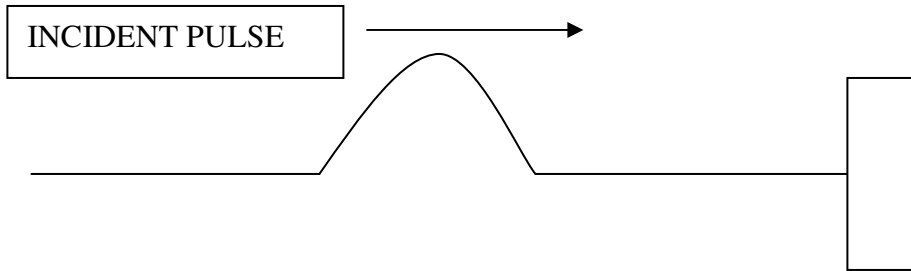
If the reading on voltmeter  $V_1$  is 24V, calculate...

- 4.1 The total resistance of the circuit. (2)
- 4.2 The reading on ammeter  $A_1$  (3)
- 4.3 The reading on voltmeter  $V_2$  (2)
- 4.4 The reading on ammeter  $A_2$  (3)

**[10]**

**QUESTION 5 (Waves and sound)**

5.1 Consider the following drawing.



5.1.1 Draw the reflected pulse for the drawing above. (1)

5.1.2 Complete the following table as it pertains to the *reflected* pulse. Only the following words may be used. **GREATER, SMALLER** or **SAME**.

Pulse length of reflected pulse compared to incident pulse	(a)
Amplitude of reflected pulse compared to incident pulse	(b)
Speed of reflected pulse compared to incident pulse	(c)

(3)

5.2 An underwater earthquake produced a wave which had a speed of  $100 \text{ m.s}^{-1}$ . Fisherman on a boat noticed that a crest moved past the boat every 20 seconds. Using this information, calculate the following.

5.2.1 The frequency of the wave. (3)

5.2.2 The wavelength of the wave. (3)

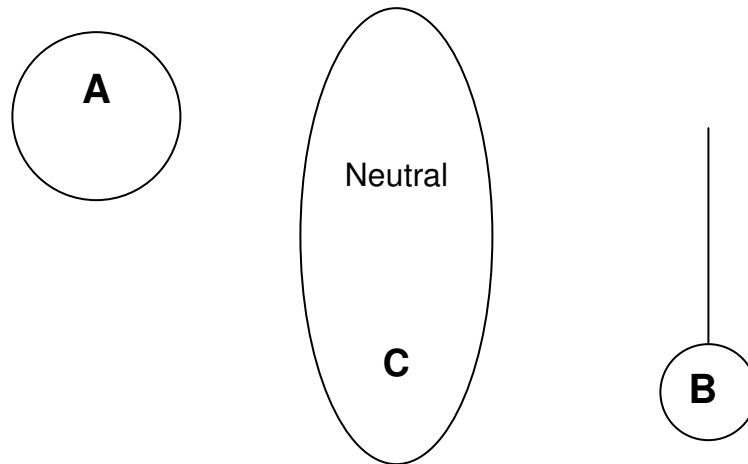
5.3 In a standing wave, what do the terms NODE and ANTINODE represent? (2)

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**[12]**

## QUESTION 6

- 6.1 Draw a series of sketches (labels may be added) to show what the effects will be on free-hanging sphere B as a result of positively charged sphere A which is put as indicated on the sketch below. Object C is a neutral object between the two spheres. (4)



- 6.2 Name and define the type of field that exists between two magnetic objects. (3)
- 6.3 Give two everyday uses of magnets. (2)
- 6.4 State in words the mathematical relationship between the distance between attracting magnets and the magnitude of the force that exists between them. (2)

[11]

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**TOTAL 60 MARKS**