SMJK YU HUA KAJANG
PEPERIKSAAN PERCUBAAN SPM TAHUN 2015

NAME:…….. **FORM: 5 ……..**

Subject: Physics Paper 3
Form: 5A – 5F
Date: 17-9-2015 (Thursday)
Time:9.10 – 10.40 (1 ½ Jam)
No of Candidates: 270
No of printed Pages:

Set by : En Pradeep Kumar
Checked by : En Tan Kok Tong
Approved by : En Pradeep Kumar
Verified by : Pn Lew Poh Peng
(KB Sains & Matematik)
Approved by : Pn Ean Yong Moon
(Penolong Kanan Pentadbiran)

PHYSICS

Paper 3
(40 marks)

One Hours and Thirty minutes
Satu jam Tiga puluh minit

1 *Kertas Soalan ini mengandungi dua Bahagian.* ***Bahagian A dan Bahagian B***
2 *Jawab semua soalan dalam* ***Bahagian A***
Tuliskan jawapan bagi ***Bahagian A*** *dalam ruang yang di sediakan dalam kertas soalan.*
3 *Jawab satu soalan daripada* ***Bahagian B***
Tuliskan jawapan ***Bahagian B*** *pada kertas jawapan berasingan.*
Jawab ***Bahagian B*** *dengan lebih terpeinci.*
Jawapan mestilah jelas dan logik
4 *Tunjukkan kerja mengira, ini membantu anda mendapat markah*

5 *Gambarajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan*
6 *Markah yang diperuntukan untuk setiap soalan atau ceraian soalan ditunjukkan untuk menjawab*

7 *Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh di programkan.*
8 *Masa yang dicadangkan untuk menjawab* ***Bahagian A*** *ialah 60 minit dan* ***Bahagian B*** *ialah 30 minit*

Kegunaan Pemeriksa			
Bahagian	Soalan	Markah Penuh	Markah
A	1	16	
	2	12	
B	3	12	
	4	12	
JUMLAH			

Section A

[28 marks]

Answer all questions in this section

1 A student carries out an experiment to investigate the relationship between the diameter, *d*, of a metal cylinder and its mass, *m*.

Diagram 1.1 shows the five cylinders that were prepared.

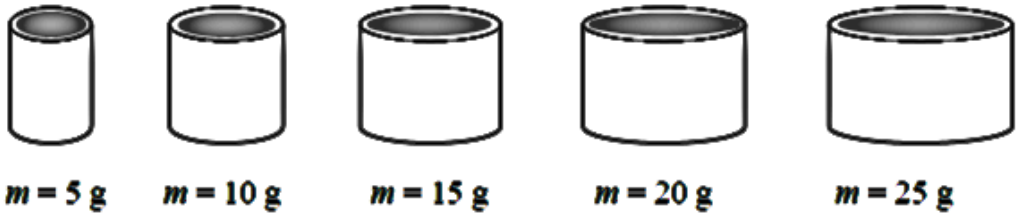


Diagram 1.1

The micrometer screw gauge in diagram 1.2 shows that there is error in the instrument even when the jaws are closed.
Name the error and state the value in the space provided

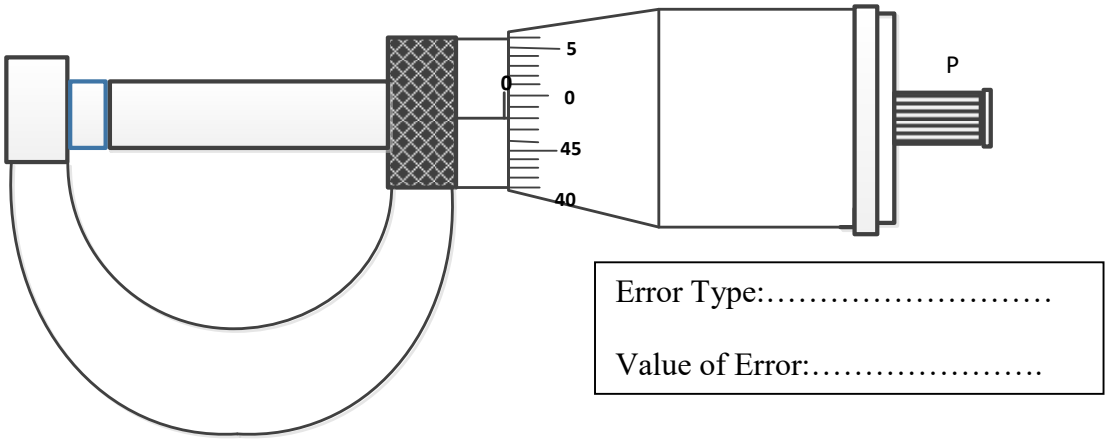


Diagram 1.2

The same micrometer screw gauge is used to measure the diameter of the cylinders. Diagram 1.3, 1.4, 1.5, 1.6 and 1.7 show the reading d, when the diameter of each cylinder is measured.

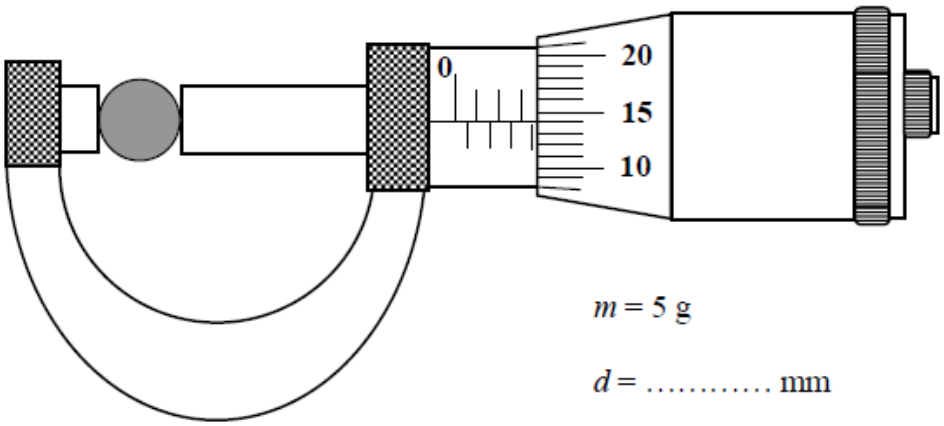


Diagram 1.3

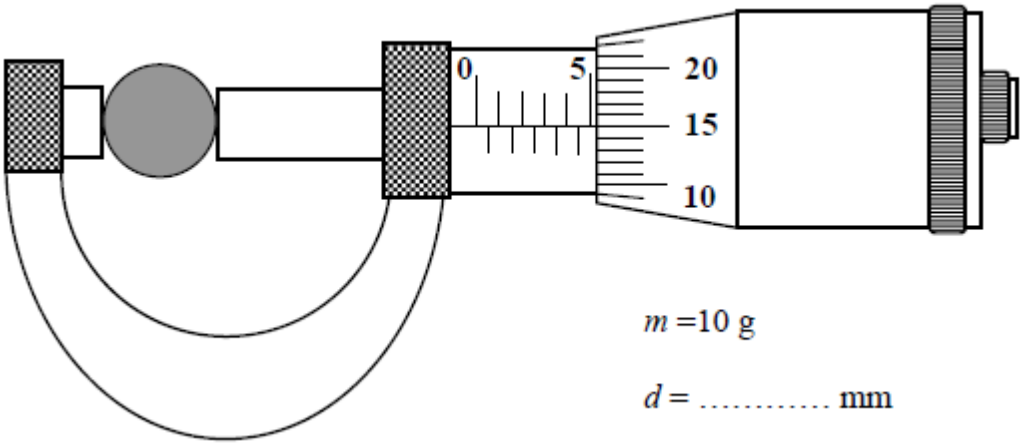


Diagram 1.4

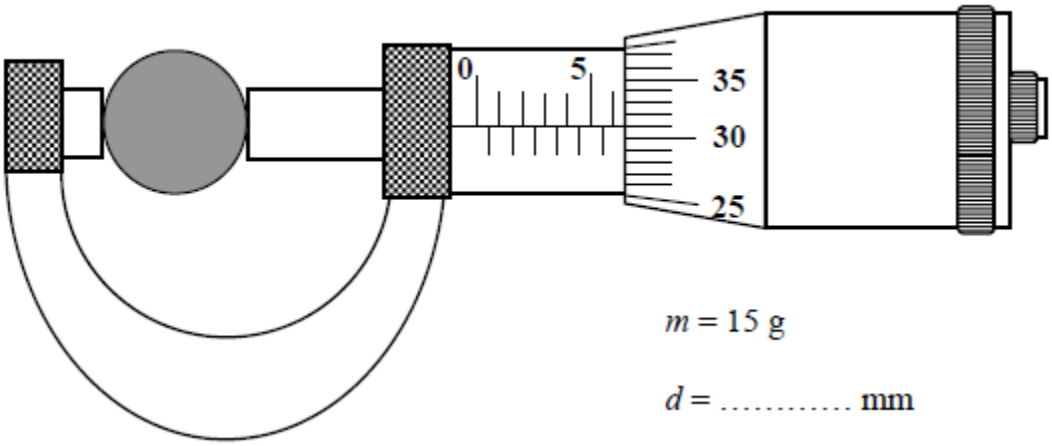


Diagram 1.5

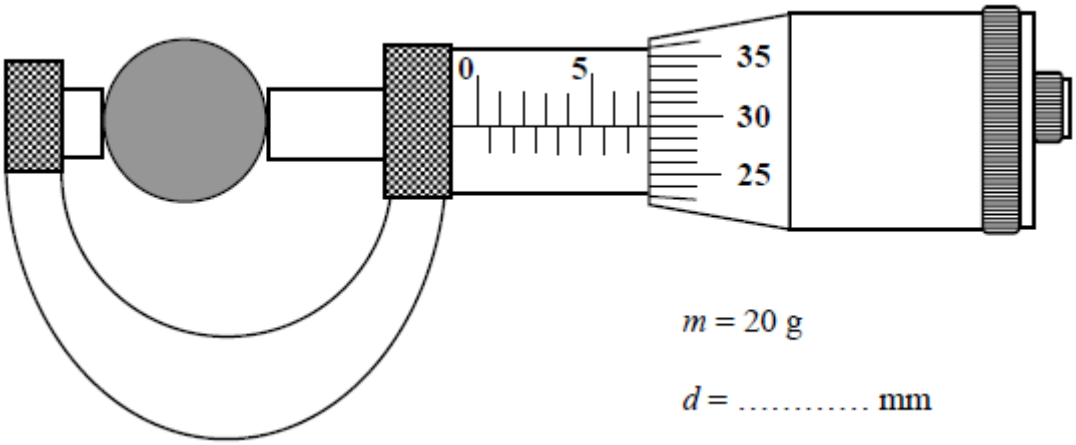


Diagram 1.6

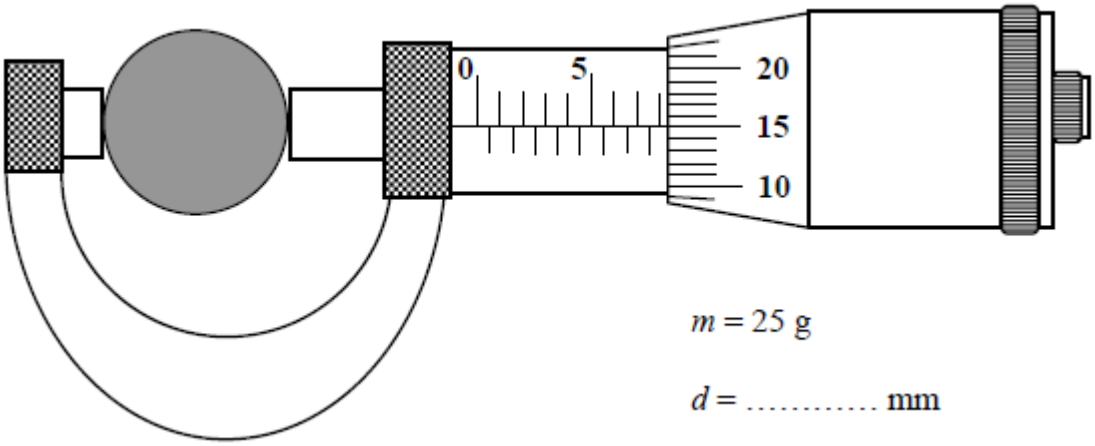


Diagram 1.7

(a) For the experiment described on page 2 identify:

(i) The manipulated variable

……. [1]

(ii) The responding variable

……. [1]

(iii) The constant variable

……. [1]

(b) (i) Based on Diagrams 1.3, 1.4, 1.5, 1.6 and 1.7 on pages 2, 3 and 4, determine and record the diameter of the cylinder, *d*.

(ii) For each value of *d* in 1(b)(i), calculate d^2.
Tabulate your data for all values of *m*, *d*, and d^2 in the space below. [5]

(iii) Name the error that was recorded above in diagram 1.2

…… [1]

(c) On the graph paper provided, draw a graph of d^2 against m [4]

(d) Based on the shape of the graph obtained, state the relationship between d^2 and m

…….

……. [1]

(e) Determine the gradient of the graph
(Show your calculation in the space provided below)

…….. [2]

[TOTAL = 16]

2. A student carries out an experiment to investigate the relationship between the potential difference across dry cell , V and the current flows I. He used an ammeter , a rheostat, fixed resistor P of **0.2 Ω** and a voltmeter which are connected as shown in Diagram 2.1

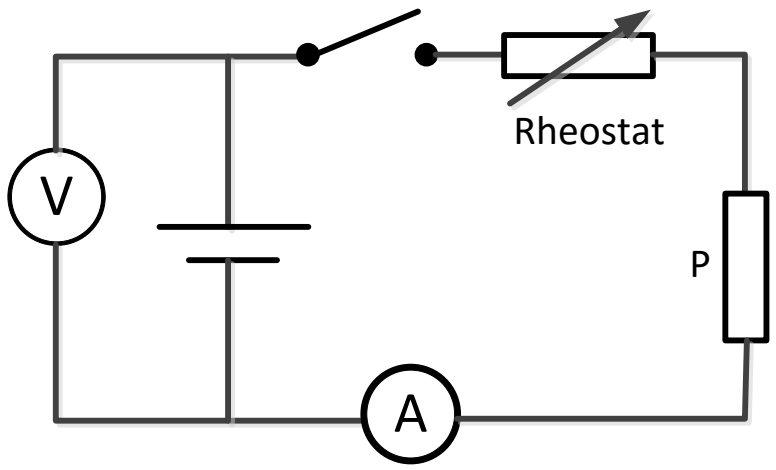


Diagram 2.1

The results of the experiment is shown in a graph of V against I shown in Diagram 2.2 on page 7.

(a) Based on the graph in Diagram 2.2,

(i) What will happen to the value of V, as I increases ?

……[1]

(ii) Determine the value of the potential difference, V when the current I=0.00A

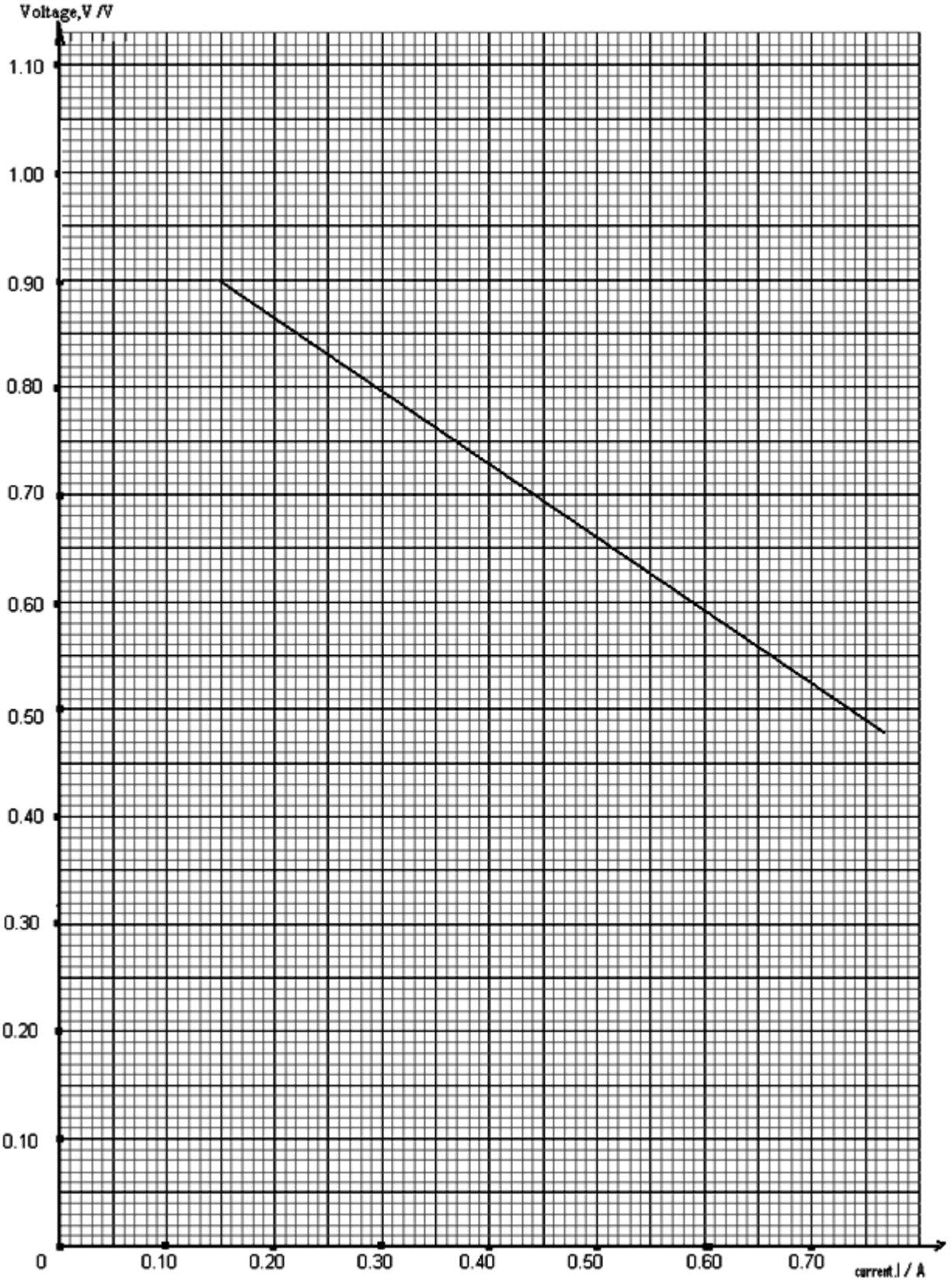
Show on the graph , how you determine the value of V

V = ……[2]

(iii) Name the physical quantity that represent the value in 2a (ii)

……[1]

Graph of V against I



(b) The internal resistance, r of the dry cell is given by equation

$$r = - m$$

where m is the gradient of the graph.

(i) Calculate the gradient, m of the graph.
Show on the graph how the value of m is determined. (Use a colored pen)
Show your calculation below

m = ……[3]

(ii) Determine the value of r

r = …… [1]

(c) (i) The electromotive force (emf) E of the dry cell is given by the formula;

$$\mathbf{E = V + Ir \ ;}$$

where V is the potential difference across the external resistors and I is the recorded values of current. Using the formula above and the values of E and r in 2a(ii) and 2 b(ii), **calculate** the value of V when I = 0.90 A [2]

(ii) Show how you would determine the resistance of rheostat when I = 0.90 A [2]
(Hint: Use Ohms Law)

Section B

[12 marks]

Answer any one question from this section

Allocate 30 minutes for this section

3. Diagram 3.1 shows a woman pushing a trolley filled with groceries in it. The trolley moves with a small acceleration.

Diagram 3.1 Diagram 3.2

Diagram 3.2 shows two woman pushing the **same trolley** where each of them exerting the same force as in Diagram 3.1. The trolley moves with a bigger acceleration

Based on the information and observation above;

(a) State one suitable inference [1]

(b) State one suitable hypothesis [1]

(c) With the use of apparatus such as trolley, elastic thread, ticker timer and other apparatus. Describe an experiment to investigate the hypothesis in 3 (b)

In your description, state clearly the following:

(i) The aim of the experiment [1]
(ii) The variables in the experiment [2]
(iii) The list of apparatus and materials [1]
(iv) The arrangement of the apparatus [1]

(v) The procedure of the experiment, which includes one method of controlling the manipulated variable and one method of measuring the responding variable [3]

(vi) The way you would tabulate the data [1]
(vii) The way you would analyse the data [1]

4. Diagram 4 shows a laser beam being directed to point A and then point B to hit the fish at P and Q respectively.

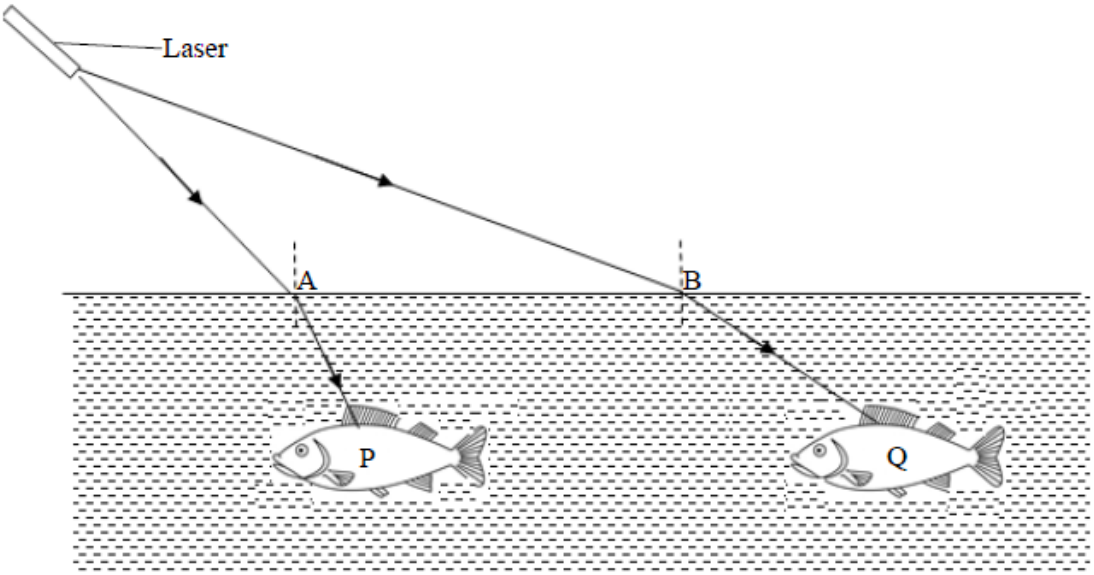


Diagram 4

Based on the observation of the phenomenon of light and the information provided

(a) State one suitable inference [1]

(b) State one suitable hypothesis [1]

(c) With the use of apparatus such as a rectangular glass block, ray box, white paper and other apparatus, describe an experiment to investigate the hypothesis in 4 (b)

In your description, state clearly the following:

(i) The aim of the experiment [1]
(ii) The variables in the experiment [2]
(iii) The list of apparatus and materials [1]
(iv) The arrangement of the apparatus [1]

(v) The procedure of the experiment, which includes one method of controlling the manipulated variable and one method of measuring the responding variable [3]

(vi) The way you would tabulate the data [1]
(vii) The way you would analyse the data [1]

E N D O F P A P E R

ANSWERS

QUESTION 4 – SBP Trail SPM 2014 P3, Q3

NO	ANSWER	MARK
4(a)	**State one suitable inference** The angle of refraction depends on the angle of incidence / *The refracted angle depends on the incidence angle*	1
(b)	**State one relevant hypothesis** When the angle of incidence increases, the angle of refraction increases	1
(c) (i)	**State the aim of the experiment** To investigate the relationship between the angle of refraction and the angle of incidence	1
(ii)	**State the variables used in the experiment** **Manipulated variable** : Angle of incidence , i **Responding variable**: Angle of refraction, r **Constant variable**: Refractive Index of glass block,n or density	 1 1
(iii)	State the complete list of apparatus and materials	