

**SMJK YU HUA
MID YEAR EXAMINATION 2016**

Subject : Physics Paper 3
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Name : _____

Class : _____

**Section A
[28 marks]**

- 1(a)(i) Mass, m
(ii) Acceleration, a
(iii) Mass of trolley

} 3

- (b)(i) Diagram
- 1.2: $x_1 = 2.0$ cm, $x_2 = 3.0$ cm
 - 1.3: $x_1 = 2.4$ cm, $x_2 = 4.3$ cm
 - 1.4: $x_1 = 2.9$ cm, $x_2 = 5.8$ cm
 - 1.5: $x_1 = 3.3$ cm, $x_2 = 7.1$ cm
 - 1.6: $x_1 = 3.6$ cm, $x_2 = 8.2$ cm

} 2 m

$$\begin{pmatrix} 6 - 1m \\ 10 - 2m \end{pmatrix}$$

- (ii) Diagram
- 1.2: $F = 0.5$ N
 - 1.3: $F = 1.0$ N
 - 1.4: $F = 1.5$ N
 - 1.5: $F = 2.0$ N
 - 1.6: $F = 2.5$ N

} 2 m

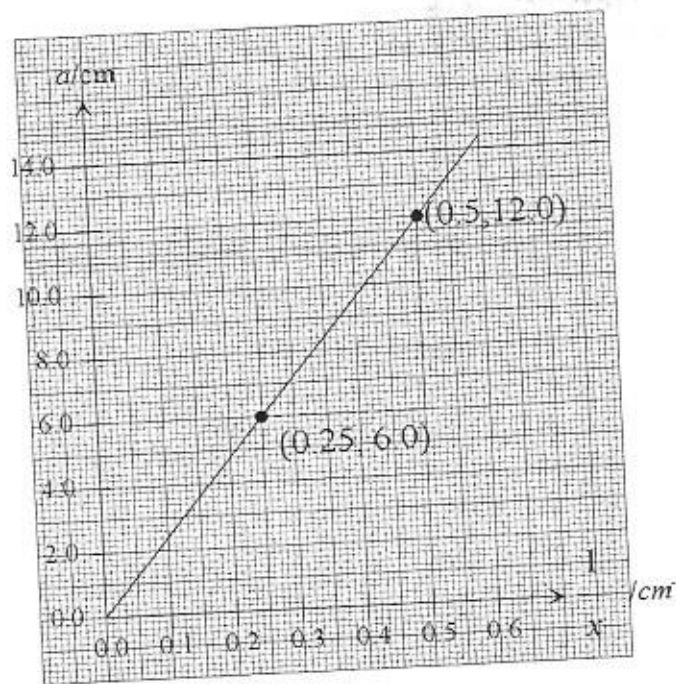
$$\begin{pmatrix} 3 - 1m \\ 5 - 2m \end{pmatrix}$$

(c)

m/kg	F/N	x_1 /cm	x_2 /cm	a/cm s ⁻²
0.05	0.5	2.0 1.9 ✓	3.0 2.9	25.0 23
0.10	1.0	2.4	4.3 4.0	47.5 45
0.15	1.5	2.9	5.8 5.7	72.5 70
0.20	2.0	3.3	7.1 7.0	95.0 90
0.25	2.5	3.6	8.2 8.1	115.0 112


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(iii)



$$\begin{aligned} \text{Gradient, } m \\ &= \frac{12.0 - 6.0}{0.5 - 0.25} \\ &= 24 \text{ cm}^2 \end{aligned}$$

$$(b) \lambda = \frac{m}{f} = \frac{24}{16.0} = 1.50 \text{ cm}$$

$$(c) v = \lambda f = 1.50 \times 18.0 = 27 \text{ cm s}^{-1}$$

(d) When taking the reading of x , the eye should be perpendicular to the scale of the metre rule to avoid parallax error.

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(a) The wavelength depends on the depth of the water

(b) The larger the velocity, the longer the wavelength

(c) (i) Aim of experiment:

To investigate the relationship between depth of water and wavelength

(ii) Manipulated variable: Depth of water

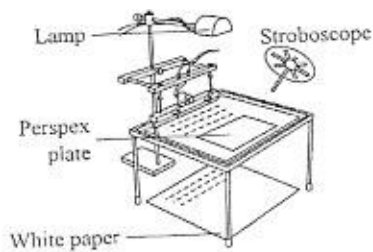
Responding variable: Wavelength

Constant variable: Frequency

(iii) List of apparatus and materials:

Ripple tank, motor, vibrating rod, lamp, power supplied, stroboscope, ruler, Perspex plates of different thicknesses

(iv) Arrangement of the apparatus:



(v) Procedure:

1. A perspex plate of thickness 0.2 cm is placed into the ripple tank and the motor started to form waves. The depth of water is represented by the thickness of the plate.
2. The stroboscope is used to freeze the wave motion. The wavelength of the waves over the Perspex plate is measured and recorded.
3. The experiment is repeated with different thicknesses of Perspex plate at 0.4 cm, 0.6 cm, 0.8 cm and 1.0 cm

(vi) Tabulate the data:

Depth /cm	Wavelength /cm
0.2	
0.4	
0.6	
0.8	
1.0	

(vii) Analyse the data:

Plot a graph wavelength against the depth of water.

