WJEC 2014 Online Exam Review

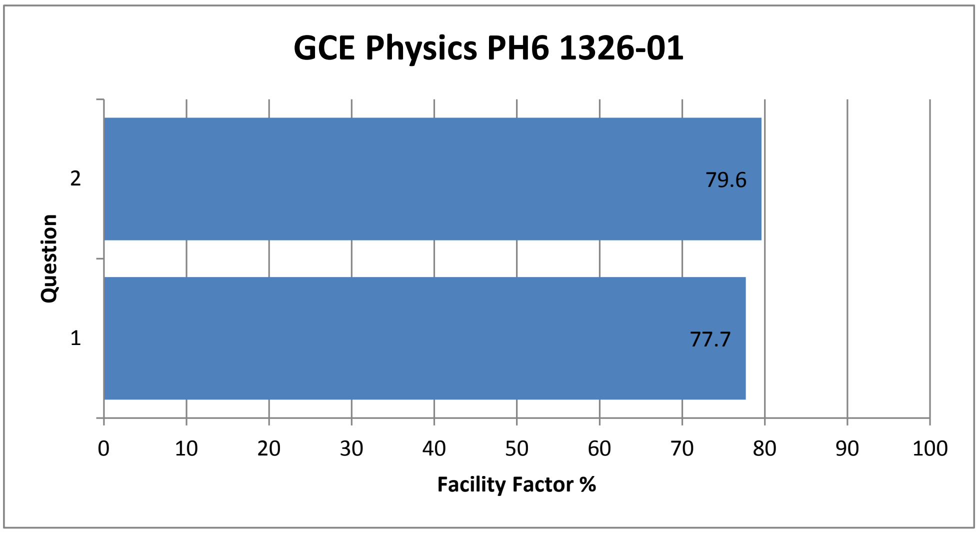
GCE Physics PH6 1326-01

All Candidates' performance across questions

Question Title	N	Mean	S D	Max Mark	F F	Attempt %
1	1518	19.4	3.7	25	77.7	99.9
2	1517	19.9	3.2	25	79.6	99.9

c (data)

b (exp) c (exp)



Examiner only

(c) The temperature coefficient of resistance, α, of copper can be found using the equation:

$$R_\theta = \alpha R_0 \theta + R_0$$

where:

R_0 = Resistance at 0 °C
R_θ = Resistance at temperature θ °C
θ = Temperature /°C
α = Temperature coefficient of resistance

Explain whether or not your graph is in agreement with the above equation. [3]

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$y = mx + c$

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In my graph, R_θ is on y-axis and θ is on x-axis intercept is R_0 and gradient $\frac{\Delta R_\theta}{\Delta \theta}$ which $= \alpha R_0$. So it is in agreement with this equation

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Yes because the graph is linear and doesnt pass the origin

~~With~~ So we have relationship $y = mx + c$

$y = R_\theta$ x = Temperature θ

c = intercept with y-axis - R at 0 °C (R_0)

and gradient $m = \alpha R_0$

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$R_\theta = \alpha R_0 \theta + R_0$
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Yes it is as the graph is a straight line and the equation is linearised into the y=mx+c form. Line has a y-intercept above the origin. Positive value for gradient also indicated by the equation.

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(b) Write a plan of how you will obtain sufficient readings to investigate this relationship. [4]

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Measure the cotton thread's length

Let the lower meter ruler at equilibrium with the distance between two vertical cotton threads is 20 cm. Rotate the lower ruler at its center of mass and take measurement of time. Then increase the distance to 30 cm, 40 cm, 50 cm, 60 cm, 70 cm and take readings of time of each distance. ~~Repeat reading~~ I choose this range of measurement to take the significant of change in time. Repeat readings twice to reduce uncertainty.

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(b) Write a plan of how you will obtain sufficient readings to investigate this relationship. [4]

I will set the ruler in place and leave it for a minute ~~30 seconds~~ to ensure it is at rest. I will then twist the ruler so the end points towards a fixed object and ~~apply a small force to one side of the pendulum and~~ measure the time it takes the ruler bifilar pendulum to do one oscillation, using a fixed point as a reference. I will then set it ~~again~~ again ~~after 30 seconds~~ and then repeat the experiment 3 times, averaging out the reading. I will then repeat this whole process 5 times, using d measurements 20.0cm, 30.0cm, 40.0cm, 50.0 cm and 60.0cm. I will attach a pointer pin to avoid parallax effect.

approximately a stand and the ... so d = 20.0cm

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Using a fixed point as a reference

Using average of 10 oscillations ... reference

Examiner only

(b) Write a plan of how you will obtain sufficient readings to investigate this relationship. [4]

1. Attach a metre ruler with a G-clip make the ruler is equalibrim.
2. Use two wires ~~connet~~ connect other metre ruler and make they are vertical to each other. 3. Rotate the mid-point and use the stopwatch measure the period ~~wen~~ when the distance of two vertical cotton threads are 20 cm, 30 cm, 40 cm, 50 cm, 60 cm, respectively. 4. Repeat the pocess to get mean value of period.

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(c) Using the apparatus, take sufficient measurements to obtain a value for n. Draw a table to show your results clearly. **The value of d should be in centimetres**. Include the resolution of the apparatus used. [5]

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istance tween pporting eads (d)/cm	ln distance between threads	Period of oscillation (T) / seconds reading 1	reading 2	reading 3	Mean reading	ln mean reading of oscillation
20.0	3.00	4.13	4.15	4.16	4.15	1.42
30.0	3.40	2.66	2.62	2.72	2.67	0.982
40.0	3.69	1.97	1.84	1.97	1.93	~~0.66~~ 0.658
50.0	3.91	1.46	1.50	1.50	1.49	0.399
60.0	4.10	1.31	1.30	1.35	1.32	0.278

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		reading 1	reading 2	reading 3	Mean reading	ln
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30·0	3·40	2.66	2·62	2·72	2·67	0·982
40·0	3·69	1·87	1·84	1·97	1·93	~~0·66~~ 0·658
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60·0	4·10	1·31	1·30	1·35	1·32	0·278

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d / cm	T_1 / s	T_2 / s	T / s	ln d	ln T
20	3.71	3.52	3.62	3.00	1.29
30	2.42	2.51	2.46	3.40	0.90
40	2.0	1.80	1.90	3.69	0.64
50	1.63	1.61	1.62	3.91	0.48
60	1.62	1.40	1.51	4.09	0.41
70				4.25	0.54
	1.00	1.10	1.05		0.05

meter ruler: 0.1 cm (1mm)

stop watch: 0.01 s

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30	2.42	2.51	2.46	3.40	0.90
40	2.0	1.80	1.90	3.69	0.64
50	1.63	1.61	1.62	3.91	0.48
60	1.62	1.40	1.51	4.09	0.41
70	~~0.91~~ 1.00	~~0.91~~ 1.10	~~1.71~~ ~~0.86~~ 1.05	4.25	0.54 0.05

meter ruler: 0.1 cm (1mm)

stop watch: 0.01 s

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d (cm) ± 0.1cm	T (s) ± 0.01 s				ln d	ln T
	T_1	T_2	T_3	$\bar{T}$		
20.0	4.09	3.94	4.06	4.03	3.00	1.39
30.0	2.78	2.62	2.60	2.67	3.40	0.982
40.0	2.13	1.85	2.00	1.99	3.69	0.688
50.0	1.53	1.56	1.60	1.56	3.91	0.445
60.0	1.31	1.25	1.19	1.25	4.09	0.223

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d (cm) ± 0.1 cm	T (s) ± 0.01 s				ln d	ln T
	T_1	T_2	T_3	$\bar{T}$		
20.0	4.09	3.94	4.06	4.03	3.00	1.39
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60.0	1.31	1.25	1.19	1.25	4.09	0.223