A Level Physics Transition Baseline Assessment

40 Marks – 40 Minutes

A single piece of graph paper is required for the completion of the assessment.

You may use a calculator.

Question Number	Topic	Score
1	Symbols and Prefixes	/3
2	Standard Form	/4
3	Re-arranging Equations	/3
4	Atomic Structure	/3
5	Recording Data	/3
6	Graphing	/4
7	Forces and Motion	/10
8	Electrical Circuits	/5
9	Waves	/5
	Total	/40

Q1 Complete the following table:

Unit prefix	Meaning
k (kilo)	x 1000
	X 0.000001
M (mega)	
N (nano)	

[3]

Q2

a) Write the following numbers into standard form.

i. 0.012

ii. 120000

iii. 0.00000012

[3]

b) Complete the following calculations and right your answers to an appropriate number of significant figures.

i. 2.1 X 0.15

ii. 0.345 ÷ 0.114

[4]

Q3 Re-arrange the following equations to make R the subject of the equation.

a) $Q = WERTY$

b) $Q^2 = WR^2$

c) $Q = W - RT^2$

[3]

Q4 Name the 3 particles (from GCSE) that make up an atom.

..... [1]

a) Which one of the above particles is not found in the nucleus of an atom?

..... [1]

b) Which of the above particles will be found in varying quantities in the nuclei of isotopes of the same element?

..... [1]

Q5

a) Complete the following table

Voltage (__)	_____ (A)		
	Repeat 1	Repeat 2	Average
2	0.23	0.26	0.25
4	0.46	0.53	
6	0.69	0.78	0.74
8	0.92	1.04	0.98
10	1.15	1.30	1.23

[3]

Q6

a) Use your piece of graph paper to plot a graph of Current (x-axis) against Voltage (y-axis) drawing a line of best fit through your data points.

[4]

b) Find the gradient of your line of best fit

[3]

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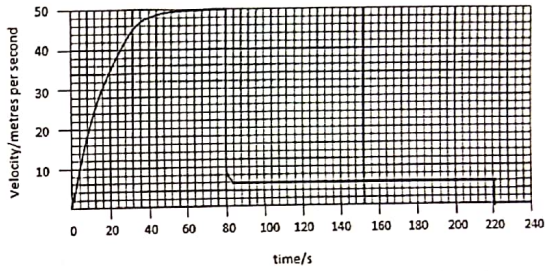
Q7 The graph below shows the journey of a skydiver after they have left the plane.



a) Explain the shape of the graph commenting on how and why the forces have changed.

[6]

b) Calculate the distance travelled whilst at the second terminal velocity.

[2]

c) Calculate the average acceleration in the first 20 seconds.

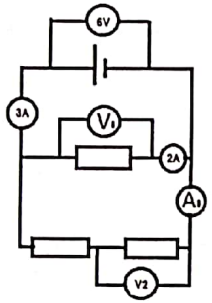
[2]

Q8

a) Draw a circuit diagram to show how the resistance of a filament bulb could be measured using an ammeter and a voltmeter.

[2]

b) Look at the circuit diagram below. All of the resistors are Identical.

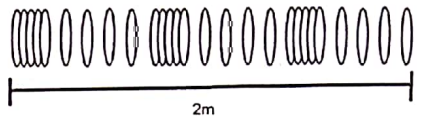


Write the missing values of current and potential difference:

i. V1 =
ii. V2 =
iii. A1 =

[3]

Q9 The diagram below shows a diagram of 3 complete longitudinal wave oscillations on a slinky:



a) State the wavelength of the wave shown

..... [1]

b) Label a complete wavelength on the diagram above with the correct symbol used for wavelength in GCSE and A Level Physics

[1]

c) If the above wave had a frequency of 5Hz how long would it take an individual hoop to complete 1 full oscillation?

[1]

d) Calculate the speed of the wave

$$wavespeed = frequency \times wavelength$$

Wave speed = _____ Unit _____[2]

A Level Physics Baseline Assessment SUGGEST MARKSCHEME

Q1

a)

Unit prefix	Meaning
k (kilo)	x 1000
μ(micro)	X 0.000001
M (mega)	x 1000000
N (nano)	x 0.000000001

[3]

Q2

c) Write the following numbers into standard form

i. 0.012 1.2×10^{-2}

ii. 120000 1.2×10^{5}

iii. 0.00000012 1.2×10^{-7}

[3]

d) Complete the following calculations and right your answers to an appropriate number of significant figures.

i. 2.1 X 0.15

a. 0.315 = 0.32(2sf)

ii. 0.345 ÷ 0.114

a. 3.0263...=3.03 (3sf)

Award 1 mark for correct answer and 1 mark for correct number of s.f. [4]

Q3 Re-arrange the following equations to make R the subject of the equation.

a) $Q = WERTY$

$$R = \frac{Q}{WETY}$$

b) $Q^2 = WR^2$

$$R = \sqrt{\frac{Q^2}{W}}$$

c) $Q = W - RT^2$

$$R = \frac{W - Q}{T^2}$$

[3]

Q4

a) Name the 3 particles (from GCSE) that make up an atom

Proton, Neutron, Electron (any order) [1]

b) Which one of the above particles is not found in the nucleus of an atom?

Electron [1]

c) Which of the above particles will be found in varying quantities in the nuclei of isotopes of the same element?

Neutron [1]

Q5

a)

Voltage (V)	Current (A)		
	Repeat 1	Repeat 2	Average
2	0.23	0.26	0.25
4	0.46	0.53	0.50
6	0.69	0.78	0.74
8	0.92	1.04	0.98
10	1.15	1.30	1.23

1 Mark for correct unit (V or volts)

1 Mark for correct heading (Current in Amps or A)

1 Mark for correct average, 1 Mark if rounded to correct number of s.f.

[3]

Q6

a) Use your piece of graph paper to plot a graph of Current (x-axis) against Voltage (y-axis) drawing a line of best fit through your data points.

1 mark if BOTH x and y axis cover half the graph paper

1 mark for correctly labelling x and y axis including units

1 mark if data points are correctly plotted (check 3)

1 mark for correct line of best fit (with even spread of points above and below)

[4]

b) Find the gradient of your line of best fit

Woking must be shown for the award of any marks

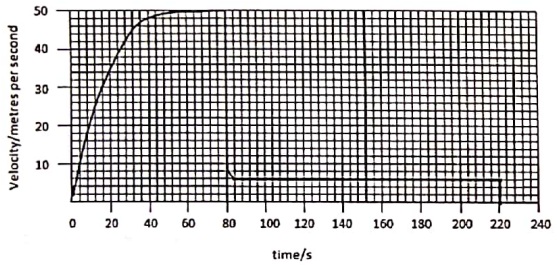
1 mark for correct y axis read offs

1 mark for correct x axis read offs

1 mark for correct calculation of their own gradient

[3]

Q7 The graph below shows the journey of a skydiver after they have left the plane.



a) Explain the shape of the graph commenting on how and why the forces have changed.

Band 1 (1/2 Marks)	Band 2 (3/4 Marks)	Band 3 (5/6 Marks)
Correctly describes the motion of the parachutists. E.g. Acceleration (at reducing rate) Terminal velocity/constant speed, deceleration, lower terminal velocity. There may be small errors in spelling and grammar.	Correctly describes motion and links to the balancing and unbalancing of the forces of weight and drag. Almost faultless spelling and grammar.	Explains why increasing velocity produces increased drag and why opening the parachute produces increase drag, using ideas of collisions of air particles with the surface of the skydiver/parachute. Faultless spelling and grammar

[6]

b) Calculate the distance travelled whilst at the second terminal velocity.

$$(220s - 84s) \times 6ms^{-1} = 816m$$

[2]

c) Calculate the average acceleration in the first 20 seconds.

$\frac{34ms^{-1}}{20s} = 1.7$ [1] ms^{-2} [1]

Award 1 mark for correct unit [2]

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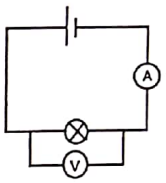
Q8

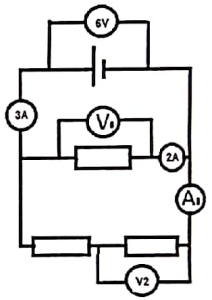
a) Draw a circuit diagram to show how the resistance of a filament bulb could be measured using an ammeter and a voltmeter.

Award 1 mark for correctly positions ammeter [1] and voltmeter [1]



[2]

b) Look at the circuit diagram below. All of the resistors are identical.



Write the missing values of current and potential difference:

i. V1 = 6V
ii. V2 = 3V
iii. A1 = 1A

[3]

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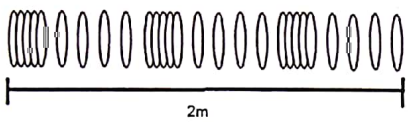
Q9 The diagram below shows a diagram of 3 complete longitudinal wave oscillations on a slinky:



a) State the wavelength of the wave shown

.....2/3m = 0.7m..... [1]

b) Label a complete wavelength on the diagram above with the correct symbol used for wavelength in GCSE and A Level Physics

[1]

c) If the above wave had a frequency of 5Hz how long would it take an individual hoop to complete 1 full oscillation?

0.2s

[1]

d) Calculate the speed of the wave

$$wavespeed = frequency \times wavelength$$

$$wavespeed = 5 \times \frac{2}{3} = 3m/s(1sf)$$

Wave speed = _____ Unit _____[2]