

Physics – Bridging work

Name:

- Work through the test paper, answering what you can.
- Make a list of the things that you found difficult in the box.
- Research the areas that you found difficult
- Go back and complete the test paper.

Areas to research:

Question	Marks
1	/5
2	/6
3	/10
4	/8
Motion total	/29
1	/6
2	/6
3	/12
Electricity total	/21
Grand Total	/50
%	
Grade	
Ex/VG/G/R/Co	

Motion

- 1** A car is travelling along a level road.



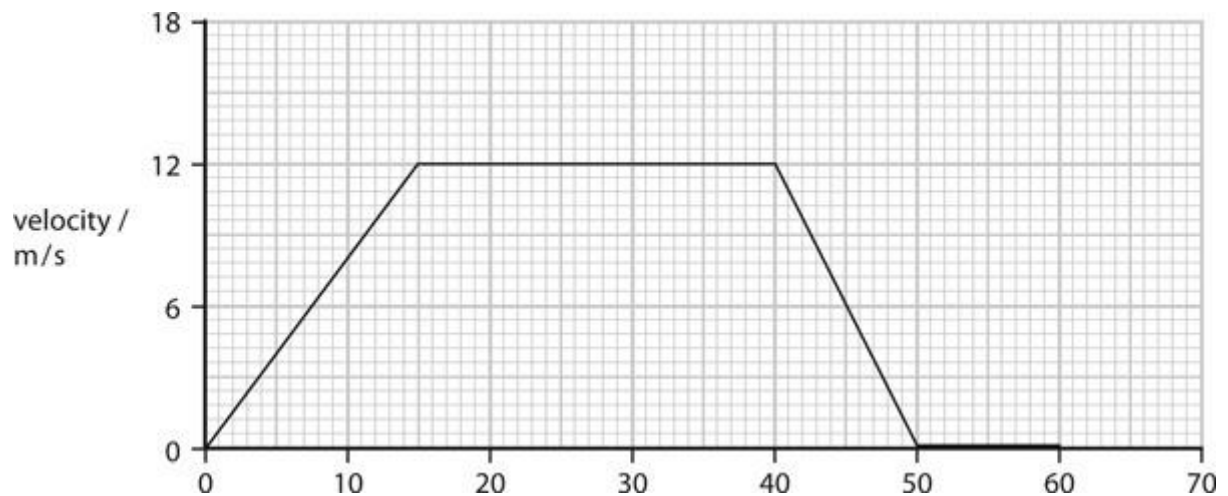
- a** The car travels at constant velocity. It covers 250 m in 40 s. Calculate the average velocity during this time.

(2 marks)

- b** The car now accelerates in a straight line.
Its average acceleration is 12 m/s^2 .
Calculate the increase in velocity of the car in 4.0 s.

(3 marks)

2 The graph shows a velocity-time graph for a cyclist over a time of 60 s.



a i When is the cyclist travelling with greatest velocity? Place a cross (☒) in the box next to your answer.

- A** for the first 15 seconds ☐
- B** between 15 and 40 second ☐
- C** between 40 and 50 seconds ☐
- D** for the last 10 seconds ☐

(1 mark)

ii Calculate how long the cyclist is stationary for in seconds.

(1 mark)

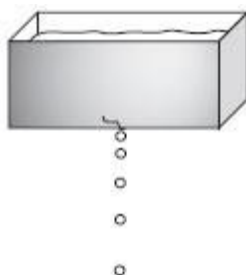
iii Calculate how far the cyclist travels in metres during the first 40 seconds.

(1 mark)

b A different cyclist accelerates for 8 s. During this time they accelerate from 3 m/s to 14.2 m/s.

Calculate the acceleration during this time. (3 marks)

3 A water tank drips water.



a Scientists could use four quantities to describe the movement of the water drops.

Three of these quantities are vectors.

The other quantity is a scalar.

acceleration	force	mass	velocity
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i Complete the sentence by putting a cross (☒) in the box next to your answer.

The scalar quantity is...

- | | |
|-----------------------|--------------------------|
| A acceleration | <input type="checkbox"/> |
| B force | <input type="checkbox"/> |
| C mass | <input type="checkbox"/> |
| D velocity | <input type="checkbox"/> |

(1 mark)

iii State any vector quantity **not** listed above.

(1 mark)

iv Complete the following sentence using one of the quantities from the word box above.

In a vacuum, all bodies falling towards the Earth's surface have the same

_____.

(1 mark)

- b** The mass of one water drop is 0.00008 kg.
Calculate its weight in Newtons.
(Gravitational field strength is 10 N/kg)

(2 marks)

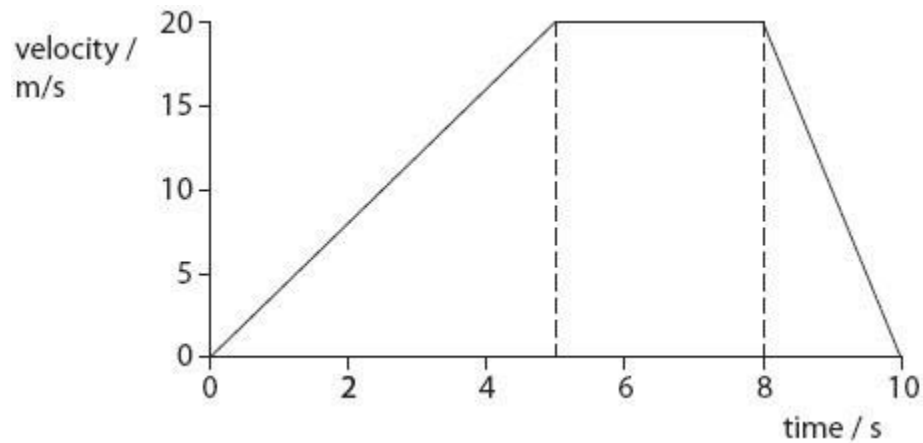
- c** The water drop falls to the ground, 13 m below, in 1.7 s.
Calculate the average speed in m/s of the drop while it is falling.

(2 marks)

- d** Assuming the droplet starts at rest calculate the velocity just before it hits the ground. Ignore air resistance.
($g = 10\text{m/s}^2$)

(3 marks)

- 4** The graph shows how the velocity of a small car changes with time.



- a** Use the graph to estimate the velocity of the car at three seconds.

(1 mark)

- b** Calculate the acceleration in m/s^2 of the car when it is speeding up.

(2 marks)

- c** Explain why the units of acceleration are m/s^2 .

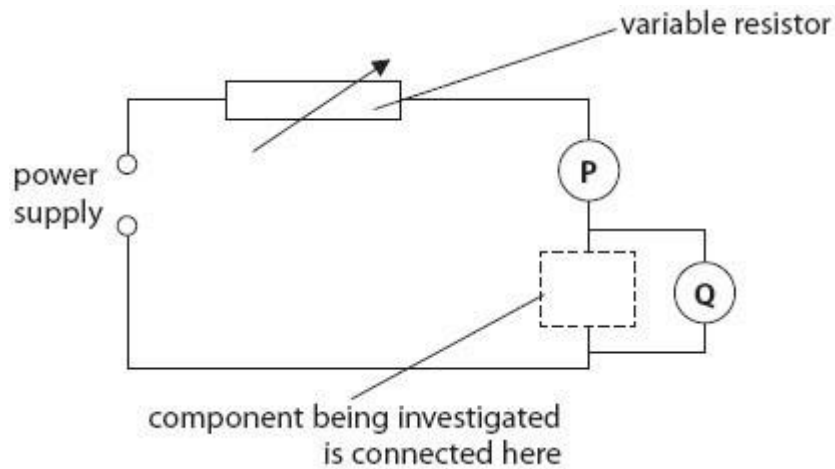
(2 marks)

- d** Show that the car travels further at a constant velocity than it does when it is slowing down.

(3 marks)

Electricity

- 1) Some students investigate the electrical resistance of different components using this circuit.



- a) Which row of the table is correct for both meters P and Q? Place a cross (⊗) in the box next to your answer.

	meter P is	meter Q is
i) <input type="checkbox"/>	an ammeter	an ammeter
ii) <input type="checkbox"/>	an ammeter	a voltmeter
iii) <input type="checkbox"/>	a voltmeter	a voltmeter
iv) <input type="checkbox"/>	a voltmeter	an ammeter

(1 mark)

- b) One of the components being investigated is a 12 ohm resistor.
When it is in the circuit, the ammeter reading is 0.50 A.
Calculate the voltmeter reading.

(2 marks)

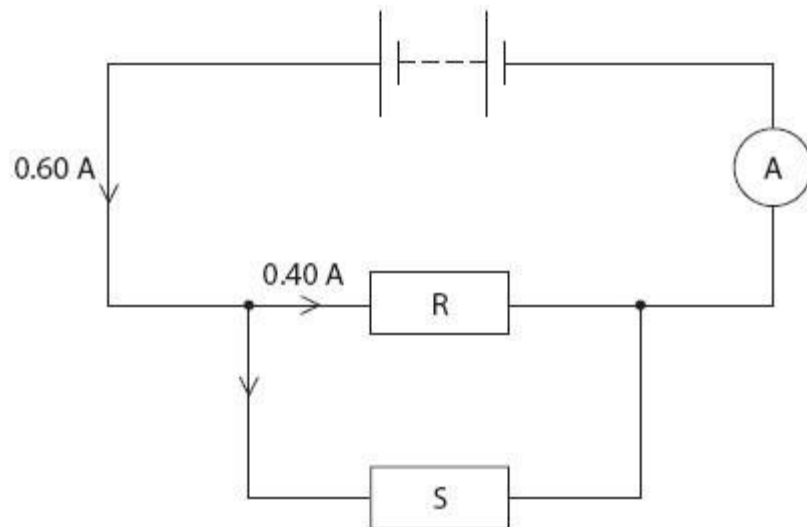
- c) The students reduce the resistance of the variable resistor.
State what happens to the readings on each of the meters P and Q. Explain what happens to P.

(2 marks)

- d)** The students then reduce the voltage of the power supply. State what happens to the current in the circuit.

(1 mark)

- 2) a** The diagram shows an electric circuit with two resistors, R and S.



- i** R has a resistance of 11 ohms.
Calculate the potential difference across R.

(2 marks)

- ii** Use information from the diagram to calculate the current in S.

(1 mark)

- iii** Calculate the resistance of S.

(2 marks)

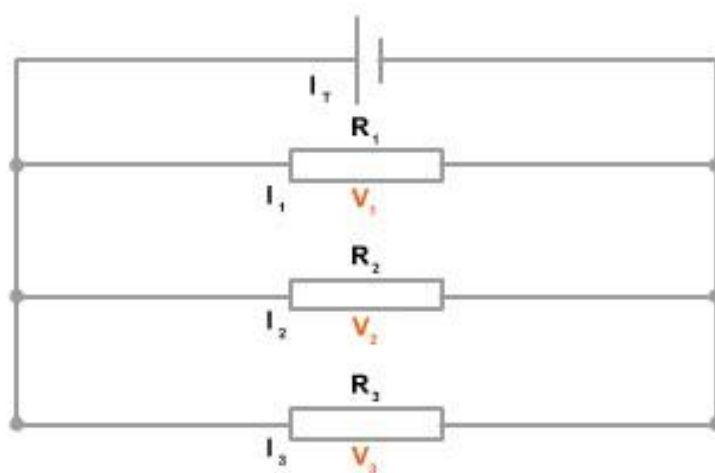
b Complete the sentence by putting a cross (☒) in the box next to your answer.

A student wants to measure the battery voltage with a voltmeter. The voltmeter should be placed...

- | | | |
|-----|---------------------------------------|--------------------------|
| (1) | in series with the battery | <input type="checkbox"/> |
| (2) | in parallel with the battery | <input type="checkbox"/> |
| (3) | in parallel with the ammeter | <input type="checkbox"/> |
| (4) | in series with either resistor R or S | <input type="checkbox"/> |

(1 mark)

3) The diagram shows an electric circuit with three resistors, R_1 , R_2 and R_3 .



a) i R_1 has a resistance of 5 ohms. The current flowing in it is 2A. Show that the potential difference across R_1 is 10V.

(2 marks)

ii State the voltage provided by the battery

(1 mark)

b) i The resistance of R_2 is 10 ohms and R_3 is 4 ohms. Calculate the current flowing in R_2

ii) Calculate the current flowing in R_3

iii) Calculate the current flowing through the battery.

(4 marks)

ii Calculate the combined resistance of R_1 , R_2 and R_3 in this arrangement.

(2 marks)

-End of assessment-
