

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.

- (a) the forces of the bike on the trailer and the trailer on the bike are equal in size
allow the force of tension acts on the bike and the trailer 1
- and opposite in direction 1
- (b) any **two** from:
- the same trailer should be used
 - the weather conditions should be the same
allow a description of this, eg the wind should be the same
 - the same road (surface) should be used
 - the same gradient road should be used
 - the same speed should be used
 - the cyclist should be at the same level of alertness throughout the experiment
allow a description of a cause of this eg the cyclist should not drink coffee between experiments 2
- (c) straight line drawn above the original line, sloping upwards 1
- (d) the cyclist's reaction time increased 1
- so the thinking distance increased 1
- stopping distance is thinking distance plus braking distance 1
- [8]

Q2.

- (a) the time it took from seeing the green light to pressing a key 1
- (b) he could have been distracted 1
- (c) boys have a shorter reaction time than girls
- or**
- reaction time improves with practice

- (d) collect more data / larger sample size
must link to response in 1.3

or

take more repeat readings per person

1

- (e) reaction time will have less effect (as distance increases)

1

because it is a smaller proportion of the total race time

1

- (f) **Level 3 (5–6 marks):**

A coherent description of the race, which uses data from the graph, including discussion of the meanings of the changing gradient of both of the lines.

Level 2 (3–4 marks):

Multiple pieces of data taken from the graphs used to evidence a comparison between the runners. Likely to include discussion of the meaning of the (changing) gradient of one of the lines. Answer not coherently structured.

Level 1 (1–2 marks):

Some data taken from the graph, but may be limited to one aspect or simple readings. Lack of coherence in answer.

0 marks:

No relevant content.

Indicative content

- A starts at constant speed for 440 m / 60 s
- A then slows down from 60 s
- the gradient for B is lower at the start so B starts at a slower speed
- the gradient for B increases so B accelerates
- B overtook A at 700 m / 114 s
- B has a greater top speed because the maximum gradient is greater
- B won the race in 126 s / beat A by 34 s

6

- (g) tangent drawn at 60s

1

data obtained using correct information

1

5.5(m / s)

accept answer in range 5.3 to 5.7

1

[15]