

Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

Mark Schemes

Q1.

- | | |
|---|---|
| (a) tiredness of the driver | 1 |
| using a mobile phone | 1 |
| (b) increases reaction time | 1 |
| so increases the thinking distance | 1 |
| so more likely to have a collision | |
| <i>allow travels a greater distance before stopping (in an emergency)</i> | 1 |
| (c) 23 m/s | 1 |
| (d) directly proportional | |
| <i>allow 1 mark for as speed increases thinking distance increases</i> | 2 |
| (e) straight line from the origin with a greater gradient | 1 |
| through (15,21) | |
| <i>allow a line that passes within half a small square of (15,21)</i> | |
| <i>dependent on MP1</i> | 1 |
| (f) $v^2 - 0^2 = 2 \times 5.0 \times 45$ | 1 |
| $v^2 = 450$ or $v = \sqrt{450}$ | 1 |
| $v = 21.21320343$ | 1 |
| $v = 21$ (m/s) | |
| <i>allow a correctly rounded value of v calculated using the correct equation</i> | 1 |

[14]

Q2.

- (a) electrostatic force 1

- (b) the downward force is the same size as the upward force 1

- (c) normal contact force 1

- (d) $W = 55 \times 9.8$ 1

539 (N) 1
allow 540 (N)

- (e) the weight decreased 1

- (f) centre of mass 1

- (g) 300 (N) 1

[8]