Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(a) the spring will return to its original length when the force is removed

1

(b) measure the original length of the spring **and** the extended length of the spring (with the metre rule)

1

extension = extended length – original length

1

(c) e = 0.080 m

1

$E_e = 0.5 \times 40 \times (0.080)^2$

allow a correct substitution using an incorrectly / not converted value of e

1

$E_e = 0.128$ (J)

allow a correct calculation using an incorrectly / not converted value of e

1

(d) force = spring constant × extension
or
F = k e

1

(e) 300 = k × 0.40

1

$$k = \frac{300}{0.40}$$

1

k = 750 (N/m)

1

[10]

Q2.

(a) a quantity with both magnitude and direction

1

(b) displacement

1

(c) gradient = $\frac{(4-0)}{}$

1

acceleration = 2.5 m/s^2

allow use of $a = \Delta v / t$

1

(d) constant deceleration

allow large deceleration allow decelerates to a stop

1

(e) resultant force = mass × acceleration

or

F = ma

allow force = mass × acceleration

1

(f) 1800 = m × 25

1

$$m = \frac{1800}{25}$$

1

m = 72 (kg)

1

(g) performance can be monitored during the game

allow do not have to wait until the end of the game to download data

1

[10]