

Name of the Student: _____

Max. Marks : 27 Marks

Time : 27 Minutes

Mark Schemes

Q1.

- (a) resultant force = zero
or
 upward force = downward force
accept forces are balanced
accept weight for downward force 1

- (b) (i) 84
allow 1 mark for correct substitution ie $840 = m \times 10$ 2

- (ii) 12
accept 12.02 for both marks
or
 1010 ÷ their (b)(i) correctly calculated
a resultant force of 1010 (N) gains 1 mark
an answer 22(.02) gains 1 mark 2

m/s^2
accept m/s/s 1

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Q2.

- (a) elastic potential 1

- (b) (i) line is straight
accept line does not curve 1

- (ii) 400
allow 1 mark for correct substitution of any pair of numbers correctly taken from the graph e.g. $160 = k \times 0.40$ 2

newtons per metre **or** N/m
if symbols are used they must be correct 1

- (iii) 300

allow 1 mark for correctly obtaining force on 1 spring = 100N

2

(c) 52

allow 2 marks for calculating change in gpe for 1 chin-up as 260 (J) or for 12 chin-ups as 3120 (J)

an answer 4.3 gains 2 marks

allow 1 mark for correct substitution into gpe equation ie $gpe = 65 \times 10 \times 0.4 (\times 12)$

or

correct use of power equation with an incorrect value for energy transferred

3

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Q3.

(a) (i) decreases (to zero)

1

resultant force acts in opposite direction to motion

accept air resistance and weight for resultant force

accept resultant force acts downwards

do **not** accept air resistance increases

1

(ii) velocity includes direction

or

velocity is a vector (quantity)

1

(b) (i) 3.6

allow 1 mark for correct substitution i.e.

$\frac{1}{2} \times 0.05 \times 12^2$ provided no subsequent step

2

(ii) 3.6 **or** their (i)

1

(iii) 7.2

or

their (ii) $\div 0.5$ correctly calculated

allow 1 mark for correct substitution i.e.

3.6 or their (ii) = $0.05 \times 10 \times h$

2

(iv) **B**

1

(c) range increases up to 45°

1

range decreases from 45°

the range is a maximum at 45° gains both marks

for any two angles that add up

to 90° the range is the same gains both marks

the range increases then decreases gains 1 mark

1

[11]