

MARK SCHEME

GCSE

PHYSICS

AQA - TRIPLE SCIENCE

P5 - TEST 1

Newtons Laws

Beginner

Mark schemes

| | | | |
|-----------|--|---|------------|
| 1. | (a) 3 (.0) | | |
| | | <i>allow 1 mark for correct substitution i.e. 25×0.12 provided no subsequent step</i> | |
| | | | 2 |
| | (b) (i) elastic potential | | |
| | | <i>correct order only</i> | 1 |
| | | kinetic | 1 |
| | (ii) increases | | 1 |
| | | to 80 (mm) (or more) | |
| | | <i>accept any number greater than 75</i> | |
| | | <i>an answer 'it (more than) doubles' gains both marks</i> | 1 |
| | (c) (i) weight | | 1 |
| | (ii) downward speed increases | | 1 |
| | | | [8] |
| 2. | B and D (either order) | | 1 |
| | B and D (either order) | | |
| | | <i>accept A and C</i> | 1 |
| | A or C | | 1 |
| | | | [3] |
| 3. | <ul style="list-style-type: none">gravityacceleratesfrictionfalls at a steady speed | | |
| | | <i>each for 1 mark</i> | |
| | | | [4] |
| 4. | (a) arrow drawn vertically downwards from the weight | | 1 |
| | | same length as given arrow | 1 |

- (b) **C**
reason only scores if C is chosen 1
- smallest force required for the same compression
steepest gradient is insufficient 1
- (c) 1.25 1
- (d) $\text{period} = \frac{1}{25}$
an answer of 0.8 (s) scores 2 marks 1
- period = 0.8 (s) 1
- (e) extension = 0.20 m 1
- $E_e = 0.5 \times 7.0 \times (0.20)^2$ 1
- $E_e = 0.14 \text{ (J)}$
an answer of 0.14 scores 3 marks 1

[10]

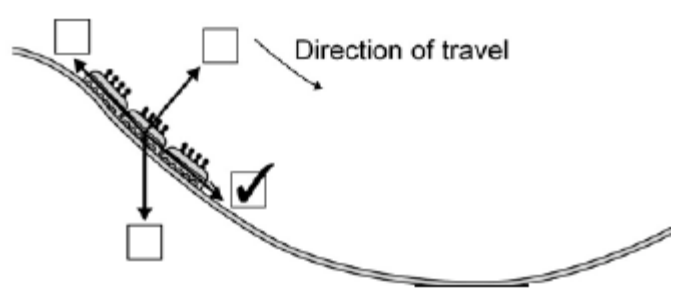
- 5.** (a) from K to L 1
- (b) the same as 1
- smaller than 1
- correct order only*
- (c) 4 N 1
- (d) the limit of proportionality is reached when a weight of 7N is added to the spring
accept any number from 6.8 to 7.2 inclusive 1
- (e) the extension is directly proportional to the weight. 1
- (f) **C** 1

[7]

- 6.** (a) (i) 50 (N)
ignore any units 1
- (ii) resultant force 1
- (iii) 4000
accept their (a)(i) × 80 correctly calculated for 2 marks
allow 1 mark for correct substitution i.e. 50 × 80 or their (a)(i) × 80
ignore any units 2
- (b) (i) joule 1
- (ii) heat 1

[6]

- 7.** (a) correct box ticked



- (b) (i) 30
ignore added units 1
- (ii) 2250 **or** their (b)(i) × 75 correctly calculated
allow 1 mark for correct substitution ie 75 × 30 or their (b)(i) × 75
provided no subsequent step shown
an answer of 750 gains 1 mark only if answer to (b)(i) is 10 2

[4]

- 8.** (a) 4 N to the right 1
- (b) (i) bigger than 1
- equal to 1
- (ii) reduces it 1

increases air resistance / drag / force C
accept parachute has large(r) (surface) area

1

[5]

9. (a) (i) horizontal arrow pointing to the left
judge by eye
drawn anywhere on the diagram

1

(ii) 60 (N)

1

(at steady speed) resultant force must be zero
accept forces must balance/are equal
accept no acceleration
do not accept constant speed

1

(b) 1680

allow 1 mark for correct substitution, ie 60 x 28 provided no subsequent step shown

2

joule

accept J
do not accept j

1

[6]

10. (a) 1800 (N)

allow 1 mark for correct substitution ie 180 x 10 provided no further steps shown

2

(b) 3780

or

their (a) x 2.1 correctly calculated

allow 1 mark for correct substitution
ie 1800 or their (a) x 2.1 provided no further steps shown

2

joule

accept J
accept any clear indication of correct answer

1

(c) 0

reason does not score if 0 not chosen

1

work is only done when a force makes an object move

accept distance moved is zero

accept no energy transfer (to the bar)

accept the bar is not moving/is stationary

'it' refers to the bar/weights

1

[7]

11.

(a) terminal

1

(b) 5.4 (kg)

correct substitution of $54 = m \times 10$ gains 1 mark

2

(c) (i) $0 < a < 10$

1

some upward force

accept some drag / air resistance

1

reduced resultant force

1

(ii) 0

1

upward force = weight (gravity)

1

resultant force zero

1

[9]