AQA GCSE PHYSICS (HIGHER) · 8463

PHYSICS



MARK SCHEME

4.5.1.2 CONTACT AND NON-CONTACT FORCES

SCORE	PERCENTAGE
/30	%

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Mark schemes

Q1.

(a) work done = 11 500 × 2.60

1

work done = 29 900 (J)

1

*an answer of 29 900 scores **2** marks*

(b) 13 800

1

(c) moment (of a force) = force × distance

allow M = F d

1

(d) 13 800 = 11 500 × distance

1

$$\text{distance} = \frac{13\,800}{11500}$$

1

distance = 1.2(0 m)

1

*of an answer 1.2(0) scores **3** marks*

[7]

Q2.

(a) D

1

(b) C

1

(c) W = 300 × 45

1

W = 13 500

1

*allow 13 500 with no working shown for **2** marks*

(d) straight line drawn from 13 m / s to 0 m / s

1

finishing on x-axis at 65 s

1

[6]

Q3.

(a) the distance travelled under the braking force

1

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(b) the reaction time will increase

1

increasing the thinking distance (and so increasing stopping distance)

(increases stopping distance is insufficient)

1

(c) No, because although when the speed increases the thinking distance increases by the same factor the braking distance does not.

1

eg

increasing from 10 m / s to 20 m / s increases thinking distance from 6 m to 12 m but the braking distance increases from 6 m to 24 m

1

(d) If the sled accelerates the value for the constant of friction will be wrong.

1

(e) only a (the horizontal) component of the force would be pulling the sled forward

1

the vertical component of the force (effectively) lifts the sled reducing the force of the surface on the sled

1

(f) $-u^2 = 2 \times -7.2 \times 22$

award this mark even with 0^2 and / or the negative sign missing

1

$u = 17.7(99)$

1

18

1

*allow 18 with no working shown for **3** marks*

*allow 17.7(99) then incorrectly rounded to 17 for **2** marks*

[11]

Q4.

(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

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*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]

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