

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Mark Schemes

Q1.

- (a) distance is a scalar and displacement is a vector

or

distance has magnitude only, displacement has magnitude and direction

1

- (b) 37.5 km

accept any value between 37.0 and 38.0 inclusive

1

062° or N62°E

accept 62° to the right of the vertical

1

accept an angle in the range 60° – 64°

accept the angle correctly measured and marked on the diagram

- (c) train changes direction so velocity changes

1

acceleration is the rate of change of velocity

1

- (d) number of squares below line = 17

accept any number between 16 and 18 inclusive

1

each square represents 500 m

1

distance = number of squares × value of each square correctly calculated – 8500 m

1

[8]

Q2.

- (a) the distance travelled under the braking force

1

- (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]