6. A train travels for a total of $270\,$s along a straight horizontal track between two stations A and B. The train starts from rest at A and moves with constant acceleration for $60\,$s until it reaches a speed of $V\,\mathrm{m\,s^{-1}}$. The train then travels at this constant speed $V\,\mathrm{m\,s^{-1}}$ before it moves with constant deceleration for $30\,$s, coming to rest at B.

(a) Sketch below a speed-time graph for the journey of the train between the two stations A and B.

(2)

Given that the distance between the two stations is $4.5\,$km,

(b) find the value of V,

(3)

(c) find how long it takes the train to travel from station A to the point that is exactly halfway between the two stations.

(4)

The train is travelling at speed $\dfrac{1}{4}V\,\mathrm{m\,s^{-1}}$ at times T_1 seconds and T_2 seconds after leaving station A.

(d) Find the value of T_1 and the value of T_2

(5)

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Question 6 continued

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Question 6 continued

Question 6 continued

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Q6

(Total 14 marks)

P 5 4 8 2 9 A 0 1 9 2 4