5. The points O, A, B and C are on a rough horizontal surface where $OABC$ is a straight line.

A particle is projected horizontally from O and slides across the surface, passing through A, B and C in that order.

The particle passes through

- A with speed $U\,\text{m s}^{-1}$
- B with speed $\frac{U}{2}\,\text{m s}^{-1}$

The coefficient of friction between the particle and the surface is $\frac{1}{7}$

It takes 0.75 s for the particle to move from A to B.

(a) Show that $U = 2.1$ to 2 significant figures.

(6)

The particle passes through C with speed $\frac{U}{3}\,\text{m s}^{-1}$

(b) Find the time taken to move from B to C.

(3)

(c) Find the distance AC.

(3)

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Question 5 continued

(Total for Question 5 is 12 marks)