2:

	P	Q	R	S	T	U	V
P	–	105	90	195	270	95	155
Q	105	–	195	295	370	190	255
R	90	195	–	110	185	180	245
S	195	295	110	–	75	115	170
T	270	370	185	75	–	180	245
U	95	190	180	115	180	–	65
V	155	255	245	170	245	65	–

The table shows the least distances, in metres, between seven signposts, P, Q, R, S, T, U and V.

Aisha must visit each signpost to check that it has not been damaged. She needs to find a route which minimises the distance travelled, starting and finishing at P.

(a) Use Prim's algorithm, starting at P, to obtain a minimum spanning tree for the network. You must clearly show the order in which you select arcs.

(2)

(b) Use the answer to part (a) to obtain an initial upper bound for the length of Aisha's route.

(2)

(c) Use the nearest neighbour algorithm, starting at P, to find a second upper bound for the length of Aisha's route. You should state both the route and its length.

(3)

(d) By deleting T and all of its arcs, and using the answer to part (a), obtain a lower bound for the length of Aisha's route.

(2)

(Total for Question 2 is 9 marks)

2:

	P	Q	R	S	T	U	V
P	–	105	90	195	270	95	155
Q	105	–	195	295	370	190	255
R	90	195	–	110	185	180	245
S	195	295	110	–	75	115	170
T	270	370	185	75	–	180	245
U	95	190	180	115	180	–	65
V	155	255	245	170	245	65	–

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Question 2 continued

	P	Q	R	S	T	U	V
P	–	105	90	195	270	95	155
Q	105	–	195	295	370	190	255
R	90	195	–	110	185	180	245
S	195	295	110	–	75	115	170
T	270	370	185	75	–	180	245
U	95	190	180	115	180	–	65
V	155	255	245	170	245	65	–

(Total for Question 2 is 9 marks)

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