Question Number	Scheme	Marks
6.(a)	ACDFEBGHA length 192 ACDFEHGBA length 185	M1 A1 A1 A1
		(4)
(b)	ACDFEHGBA 185 as this is the shorter length.	B1ft
		(1)
(c)	BC CD DF FE EH HG or BC CD CE FE EH HG Length 127 (accept 22 + 18 + 21 + 17 + 25 + 24) Adds AB AC 127+19+24=170	M1 A1 dM1 A1
		(4)
(d)	$172 \leqslant d \leqslant 185$	B1ft
		(1)
		10 marks
	Notes for Question 6	
a1M1	Nearest Neighbour – first four arcs correctly chosen in order (AC, CD, DF, FE …) **or** first five nodes {A, C, D, F, E, … } correctly chosen in order. Order of nodes may be seen at the top of a matrix/table {1, -, 2, 3, 5, 4, -, - }.	
a1A1	One NN route correct, either listed as arcs or ACDFEBGHA or ACDFEHGBA	
a2A1	Both NN routes correct, either listed as arcs or ACDFEBGHA and ACDFEHGBA	
a3A1	Both lengths correct – must be clearly linked to the correct route	
b1B1ft	CAO Route and reason. Must have found two routes with distinct lengths.	
c1M1	Prim starting at B to find RMST – first four arcs correct either (BC, CD, DF, FE …) or (BC CD CE FE …) or first five nodes {B, C, D, F, E, … } or {B, C, D, E, F …} Order of nodes may be seen at the top of a matrix/table, where A may or may not have been crossed out, either { -, 1, 2, 3, 5, 4, -, - } or {-, 1, 2, 3, 4, 5, -, - }.	
c1A1	CAO RMST and 127 (or 22 + 18 + 21 + 17 + 25 + 24) seen (if 127 with no working then M0) – arcs for RMST must be stated, not just seen e.g. circled in table.	
c2dM1	Dependent on previous M – adds two shortest arcs from A (AB and AC). Sight of '127'+19 +24 or '127+43' or '22 + 18 + 21 + 17 + 25 + 24 + 19 + 24' is sufficient here.	
c2A1	CAO Note: M1A0M1A1 is possible in (c).	
d1B1ft	CAO – allow strict inequalities Follow through their smaller value from (a) as the upper bound and the larger of 172 and their answer to (c) for their lower bound. Their lower bound must be less than their upper bound.	