Question Number	Scheme	Marks
5.(a)	**Semi-Eulerian** as there are exactly **two nodes** with **odd** degree	B1 **(1)**
(b)(i)	Repeat D(CGJ)K length 23 Total 338 + 23 = 361 (km)	M1 A1
(b)(ii)	DC, CG, GJ and JK	A1 **(3)**
(c)(i)	A(BC)D + K(LM)N = 44 A(BCGJ)K + D(CGJI)N = 69 A(FM)N + D(CGJ)K = 55 Total 338 + 44 = 382 (km)	M1 A1 A1 A1ft
(c)(ii)	AB, BC, CD, KL, LM and MN	A1 **(5)**
		9 marks
	Notes for Question 5	
a1B1	CAO – must state reason (as a minimum must see the words in bold and should imply exactly/only two) (accept equivalent wording) (accept reasons e.g. all vertices apart from D and K are even) (must use correct technical language so nodes or vertices but not points) (Any reference to specific vertices must be to the correct vertices only, D K)	
bi1M1	Calculates shortest path for DK	
bi1A1	CAO (361 implies both marks)	
bii1A1	CAO – must be arcs so do not accept DCGJK	
ci1M1	Three pairings of the correct four nodes (A, D, K and N) including totals	
ci1A1	Two rows correct including pairings **and** totals	
ci2A1	All three rows correct including pairings **and** totals	
ci3A1ft	338 + their shortest from a choice of 3 totals	
cii1A1	CAO – must be arcs so do not accept ABCD KLMN	