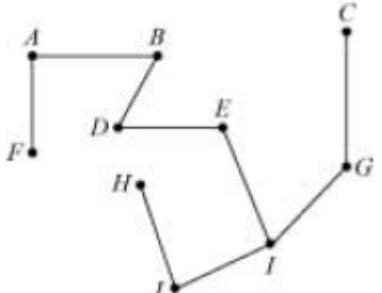
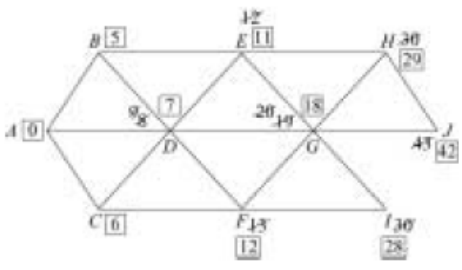
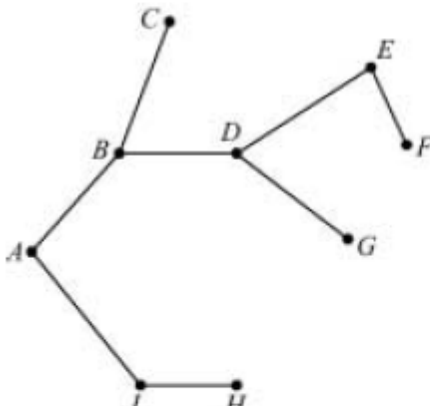


Decision 1 Minimum Spanning Trees Answers

3(a)(i)	9	B1	1	
	(ii) $n - 1$	B1	1	
(b)(i)	<i>GI</i> 5 <i>AB</i> 6 <i>EI</i> 7 <i>BD</i> 8 <i>EG</i> 9 <i>LJ</i> 10 <i>HJ</i> 11 <i>HI</i> 12 <i>AF</i> 13 <i>DE</i> 14 <i>CG</i> 15	B1 M1 A1 A1 A1	1 5	9 edges SCA start with <i>GI</i> <i>LJ</i> fifth all correct
	(ii) 89	B1	1	
(iii)		M1 A1	2	9 edges
Total			10	

3(a)(i)	<i>AB</i> 5 <i>BD</i> 3 <i>DC</i> 1 <i>DE</i> 4 <i>DF</i> 5 <i>FG</i> 6 <i>GI</i> 10 <i>GH</i> 11 <i>HJ</i> 13	M1 B1 A1 A1	5	SCA 9 edges <i>DC</i> 3 rd <i>DE</i> 4 th All correct
	(ii) 58	B1	1	
(b)(i)		M1 M1 A1 M1 A1 B1	6	SCA 3 values at <i>D</i> All correct at <i>D</i> 3 values at <i>G</i> All correct 42 at <i>J</i> – or in script
	(ii) $28 + x < 42$ O.E. $x < 14$ ISW	M1 A1	2	Allow \leq SC $x \leq 13$ B1
Total			14	

1(a)	AB 5.5 BC 8 AI 9 BD 13 DE 9 DG 11 DF, EF, GF 12 IH 16.5	B1 M1 A1 A1 A1	5	8 edges SCA AI 3rd BD 4th All correct
(b)	84	B1	1	
(c)		M1 B1 A1	3	Minimum spanning tree 8 edges All correct including labelling (or including DF or GF instead of EF)
(d)	2	B1	1	
Total			10	

4(a)(i)	<i>SD</i>	12	M1		Prim's (first 4 edges, allow 1 slip)
	<i>SC</i>	13			
	<i>SA</i>	14	B1		12 edges
	<i>SB</i>	16			
	<i>DH</i>	75			
	<i>HG</i>	23	A1		<i>HG</i> 6 th
	<i>GF</i>	22			
	<i>FE</i>	24			
	<i>EI</i>	81	A1		<i>EI</i> 9 th
	<i>IJ</i>	12			
	<i>GK</i>	83			
	<i>KL</i>	16	B1	5	All correct
(ii)		391	B1	1	
(iii)			M1		MST (10 + edges)
			A1		12 edges
			A1	3	All correct
(iv)	<i>GF</i> 7 th (22) <i>HG</i> 8 th (23)		B1		
			B1	2	
(b)	Odd vertices (<i>E, H, J, K</i>) $EH + JK = 69 + 131 = (200)$ $EJ + HK = 93 + 106 = (199)$ $EK + JH = 129 + 142 = (271)$ Repeat $EJ + HK$ Total $1135 + 199 = 1334$		E1		PI
			M1		2 correct sets of pairings
			A3,2,		
			1,0		
			B1	6	
Total				17	