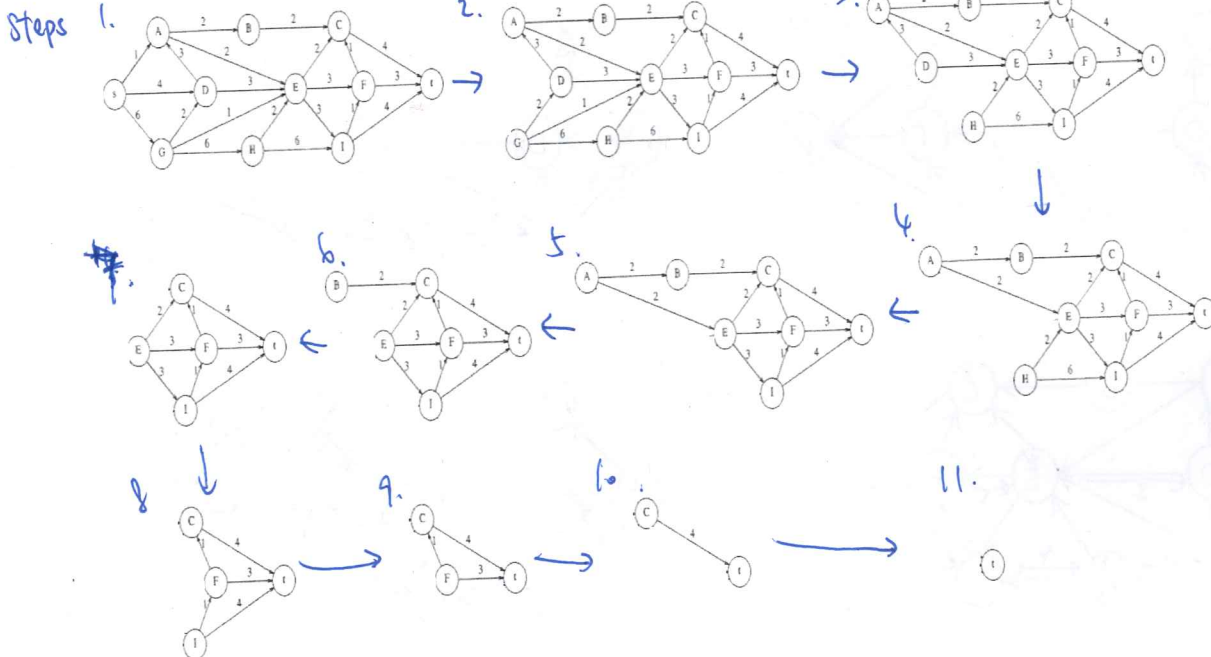


7.1) Indegree Table:

Vertex\Step	1	2	3	4	5	6	7	8	9	10	11
s	0	0	0	0	0	0	0	0	0	0	0
A	2	1	1	0	0	0	0	0	0	0	0
B	1	1	1	1	1	0	0	0	0	0	0
C	3	3	3	3	3	3	2	1	1	0	0
D	2	1	0	0	0	0	0	0	0	0	0
E	4	4	3	2	1	0	0	0	0	0	0
F	2	2	2	2	2	2	2	1	0	0	0
G	1	0	0	0	0	0	0	0	0	0	0
H	1	1	0	0	0	0	0	0	0	0	0
I	2	2	2	2	1	1	1	0	0	0	0
t	3	3	3	3	3	3	3	3	2	1	0
Enqueue	s	G	D, H	A		B, E		I	F	C	t
Dequeue	s	G	D	H	A	B	E	I	F	C	t



Topological ordering: s, G, D, H, A, B, E, I, F, C, t

7.3) 1) (With Priority Queue)

Vertex\Step	1	2	3	4	5	6	7	8	9
A	inf	0	0	0	0	0	0	0	0
B	inf	inf	5	5	5	5	5	5	5
C	inf	inf	3	3	3	3	3	3	3
D	inf	inf	inf	10	10	10	9	9	9
E	inf	inf	inf	10	10	7	7	7	7
F	inf	inf	inf	inf	inf	inf	8	8	8
G	inf	inf	inf	inf	6	6	6	6	6
Enqueue	A	B, C	D, E	G		F			
Dequeue		A	C	B	G	E	F	D	

Shortest path from A to:

- B: 5 (A to B)
- C: 3 (A to C)
- D: 9 (A to B to G to E to D)
- E: 7 (A to B to G to E)
- F: 8 (A to B to G to E to F)
- G: 6 (A to B to G)

7.3) 2)

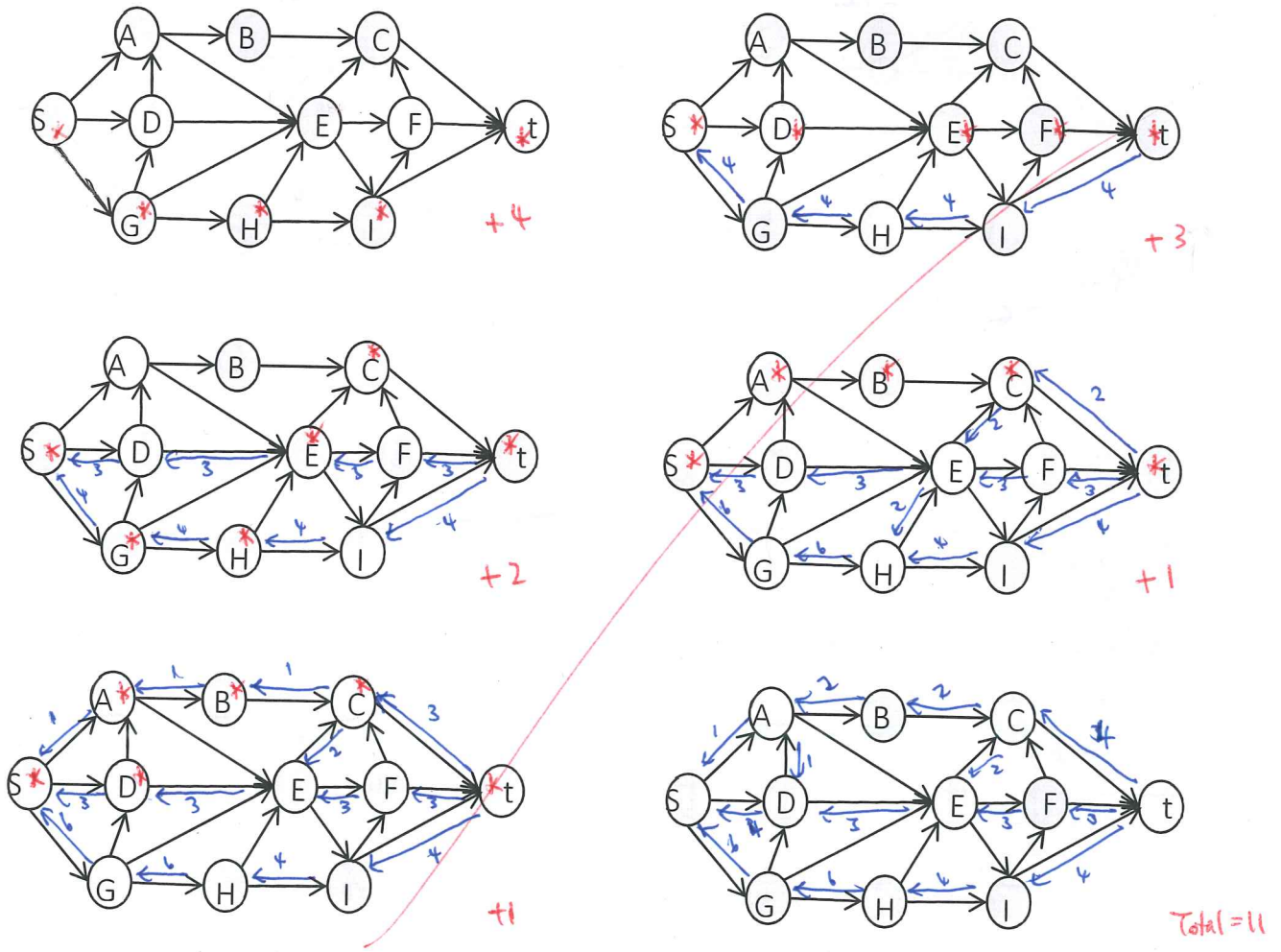
Vertex\Step	1	2	3	4	5	6	7	8	9
A	inf	inf	inf	inf	inf	inf	3	3	3
B	inf	0	0	0	0	0	0	0	0
C	inf	inf	1	1	1	1	1	1	1
D	inf	inf	inf	2	2	2	2	2	2
E	inf	inf	1	1	1	1	1	1	1
F	inf	inf	inf	inf	2	2	2	2	2
G	inf	inf	1	1	1	1	1	1	1
Enqueue	B	C,E,G	D		F	A			
Dequeue		B	C	E	G	D	F	A	

(Priority Queue)

Shortest path from B to:
 A: 3 (B to C to D to A)
 C: 1 (B to C)
 D: 2 (B to C to D)
 E: 1 (B to E)
 F: 2 (B to E to F)
 G: 1 (B to G)

7.4

Maximum Flow = 11



7.5) 1)

Prims

A	0										
B	3										
C	inf	10	10	10	10		6	1			
D	4	4	4	4	4	4	4	4	4		
E	4	2									
F	inf	3	3	3	3						
G	inf	inf	inf	inf	inf	2					
H	inf	inf	2	2							
I	inf	inf	1								
J	inf	inf	inf	7	7	7	7	7	7	7	7

MST is formed with {B,F}, {C,G}, {A,D}, {B,E}, {F,B}, {G,F}, {H,E}, {I,E}, {J,I}.

Kruskal's

- Length 1: C,G E,I
- Length 2: B,E F,G E,H
- Length 3: A,B B,F F,I
- Length 4: H,I A,D A,E
- Length 5: D,E
- Length 6: D,H C,F
- Length 7: I,J
- Length 8: G,J
- Length 10: B,C
- Length 11: E,F F,J

MST is formed with {C,G}, {E,I}, {B,E}, {F,G}, {E,H}, {A,B}, {B,F}, {A,D}, {I,J}.

The minimum spanning tree is not unique, as seen from the difference in the above two MST formed.