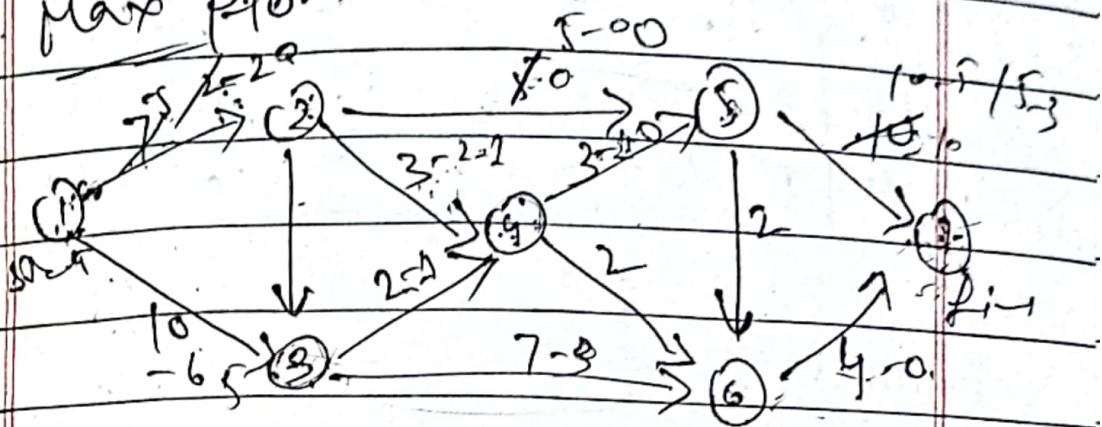
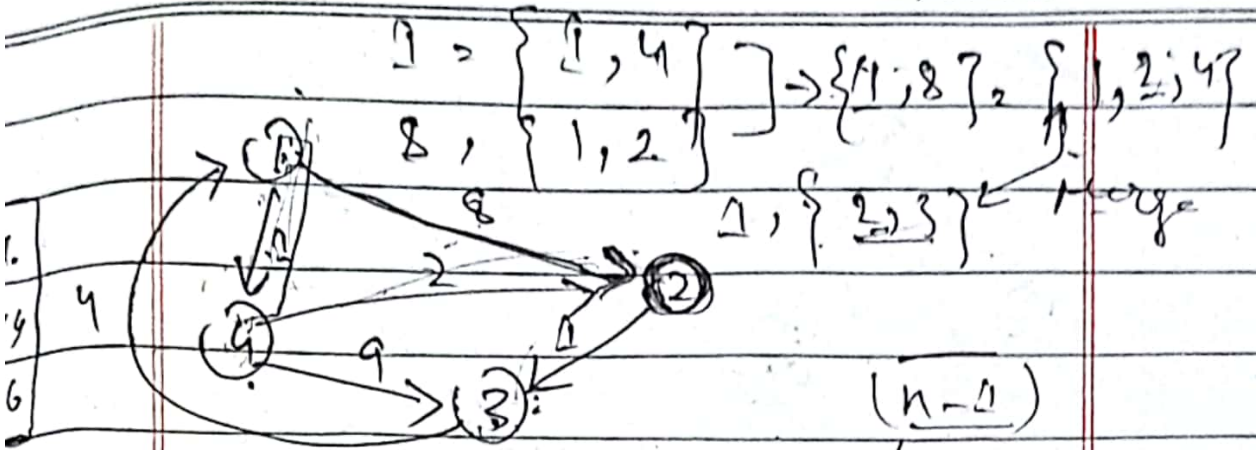


0, (1 2 3) →

Max Flow



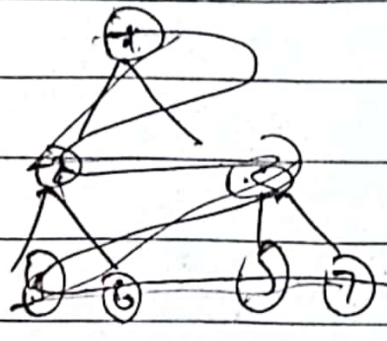
Path	Flow
1 → 2 → 5 → 7	5
1 → 2 → 4 → 5 → 7	2
1 → 3 → 6 → 7	4
1 → 3 → 4 → 5 → 7	1
(12)	



BFS & Breath

$(n-1)$
↓
vertices

$n-1$
 $4-1=3$

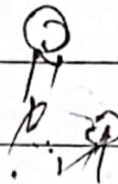


$E = n-4$

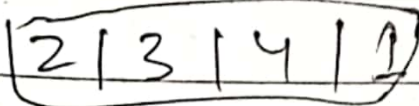
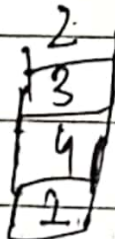
$4-1$

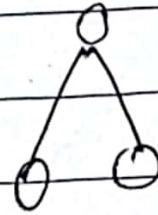
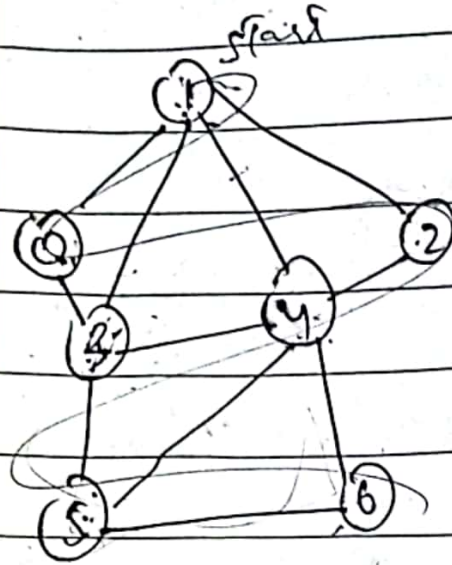
(3)

FIFO, Queue



DFS, LIFO, stack





BFS

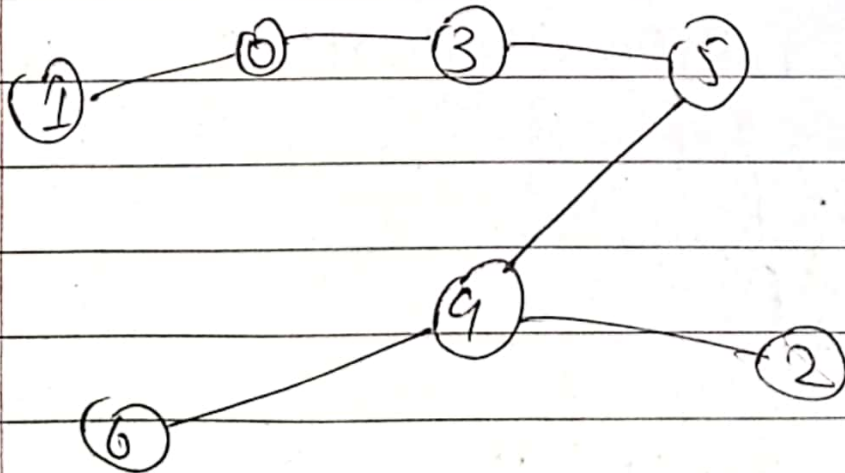
1 → 1 0 → 1 0 3 →

1 0 3 4 2 5 6

DFS

Kruskal $n-1 = 6$

7



Dijkstra

1.	0	3	4	2	5	6
1, 0	(7)	9	7	8	∞	∞
1, 0, 4	7	9	(7)	8	∞	∞
1, 0, 4, 2	7	9	7	(8)	12	16
1, 0, 4, 2, 3	7	(9)	7	8	12	16
1, 0, 4, 2, 3, 5	7	9	7	8	(12)	16
1, 0, 4, 2, 3, 5, 6	7	9	7	8	12	(16)

Shortest Distance from single -

1 \rightarrow 0 \rightarrow 4 \rightarrow

Prims

Optimal BST

Keys = 1, 2, 3, 4, 5
 frequencies = 4, 1, 2, 9, 2

$$C[x, y] = \min[C(x, i) + C(i, y)] + w(x, y)$$

	0	1	2	3	4	5
0	0	4 ⁽²⁾	15 ⁽²⁾	19 ⁽²⁾	39 ⁽²⁾	48 ⁽²⁾
1		0	7	11 ⁽²⁾	29 ⁽⁴⁾	33 ⁽⁴⁾
2			0	2	13 ⁽⁴⁾	17 ⁽⁴⁾
3				0	9	13 ⁽⁴⁾
4					0	2
5						0

$$\begin{aligned}
 C[0, 2] &= \min \{ C[0, 0] + C(1, 2), \\
 &\quad C[0, 1] + C(2, 2), \} + w[0, 2] \\
 &= \min \{ 0 + 7, \\
 &\quad 4 + 0 \} + 11 \\
 &= 4 + 11 = 15
 \end{aligned}$$

$$C[1,3] = \begin{bmatrix} C(1,1) + C(2,3) \\ C(1,2) + C(3,3) \end{bmatrix} + \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$= \begin{bmatrix} 0 + 2 \\ 2 + 0 \end{bmatrix} + \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$= 2 + 1 = 3$$

$$C[2,4] = \begin{bmatrix} C(2,2) + C(3,4) \\ C(2,3) + C(4,4) \end{bmatrix} + \begin{bmatrix} 2 \\ 2 \end{bmatrix}$$

$$= \begin{bmatrix} 0 + 9 \\ 2 + 0 \end{bmatrix} + \begin{bmatrix} 2 \\ 2 \end{bmatrix}$$

$$= \begin{bmatrix} 9 \\ 2 \end{bmatrix}$$

$$= 2 + 11 = 13$$

$$C[3,5] = \begin{bmatrix} C(3,3) + C(4,5) \\ C(3,4) + C(5,5) \end{bmatrix} + \begin{bmatrix} 3 \\ 3 \end{bmatrix}$$

$$= \begin{bmatrix} 0 + 2 \\ 9 + 0 \end{bmatrix} + \begin{bmatrix} 3 \\ 3 \end{bmatrix}$$

$$C[0, 4] = \left[\begin{array}{l} (0, 0) + (0, 4) \\ (0, 1) + (1, 4) \\ (0, 2) + (2, 4) \\ (0, 3) + (3, 4) \end{array} \right] + C[0, 0]$$

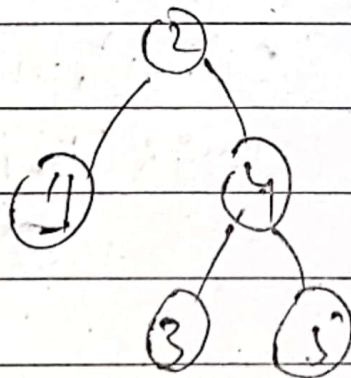
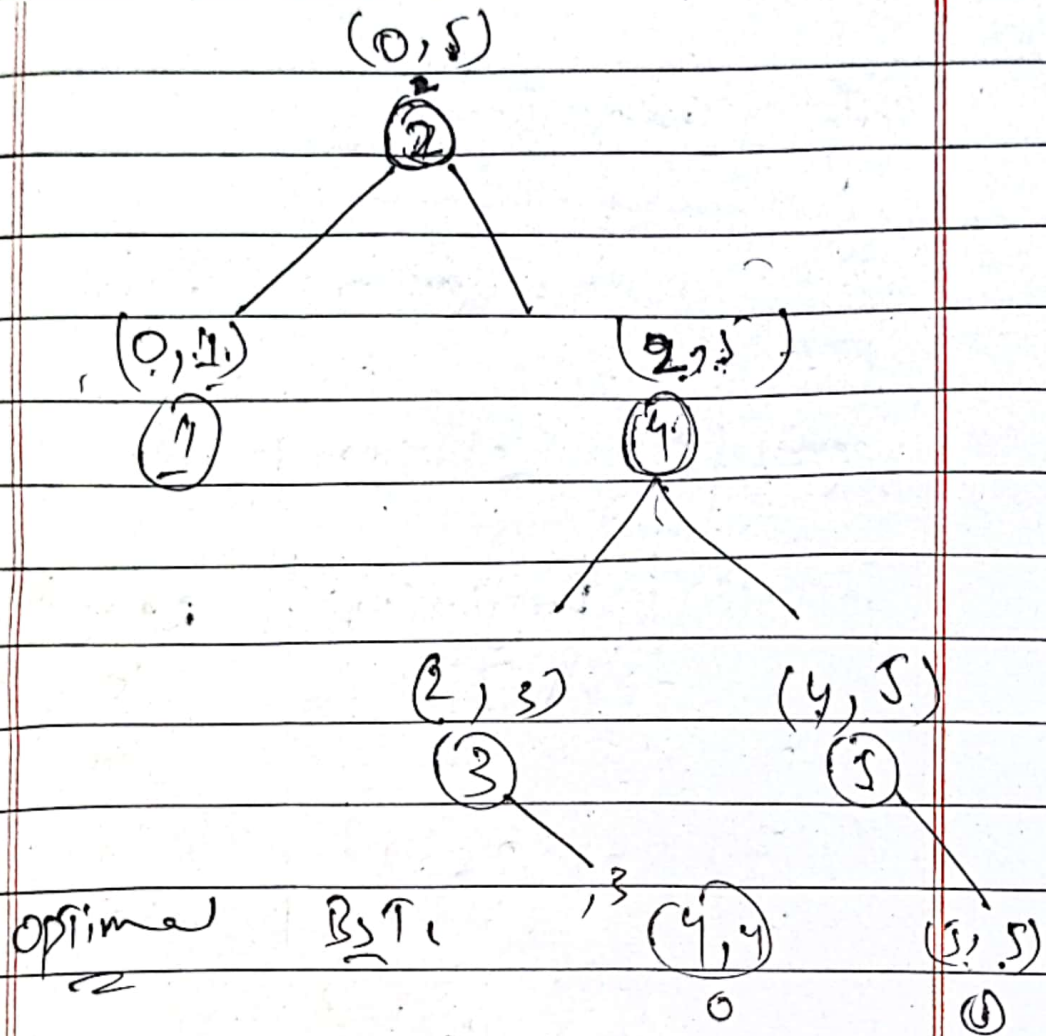
$$= \left[\begin{array}{l} 0 + 29 \\ 7 + 23 \\ 15 + 9 \\ 19 + 0 \end{array} \right] + 22$$

$$= 39$$

$$C[0, 5] = \left[\begin{array}{l} (0, 0) + (0, 5) \\ (0, 1) + (1, 5) \\ (0, 2) + (2, 5) \\ (0, 3) + (3, 5) \\ (0, 4) + (4, 5) \end{array} \right] + C[0, 0]$$

$$= \left[\begin{array}{l} 0 + 33 \\ 7 + 17 \\ 15 + 13 \\ 19 + 2 \\ 39 + 0 \end{array} \right] + 24$$

$$= 45$$



Activities selection

Activity	1.	2.	3.	4.	5.	6.	7.	8.
Start time	1	4	0	5	6	8	2	12
End time	4	6	7	9	9	12	14	16

$$Set 1 = \{A_1, A_2, A_5, A_8\}$$

$$Set 2 = \{A_1, A_4, A_8\}$$

$$Set 3 = \{A_2, A_6\}$$

$$Set 4 = \{A_3, A_6\}$$

$$Set 5 = \{A_4, A_8\}$$

$$S_5 = \{A_5, A_8\}$$

$$S_6 = \{A_6\}$$

$$S_7 = \{A_7\}$$

$$S_8 = \{A_8\}$$