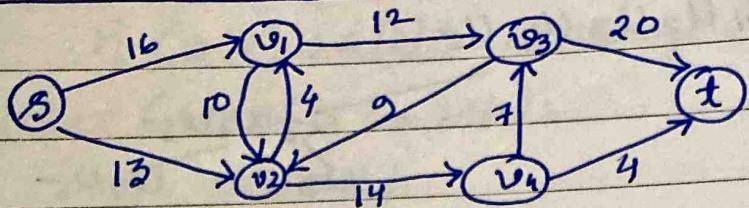
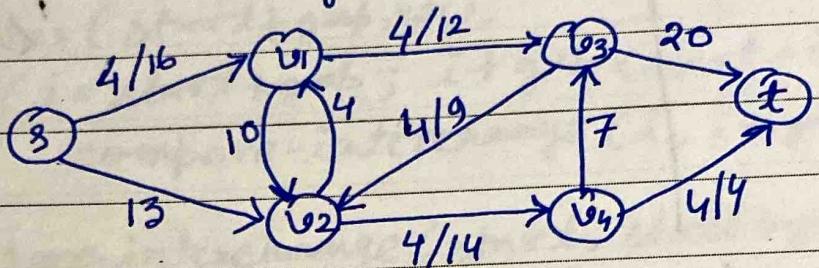


### Ford Fulkerson:

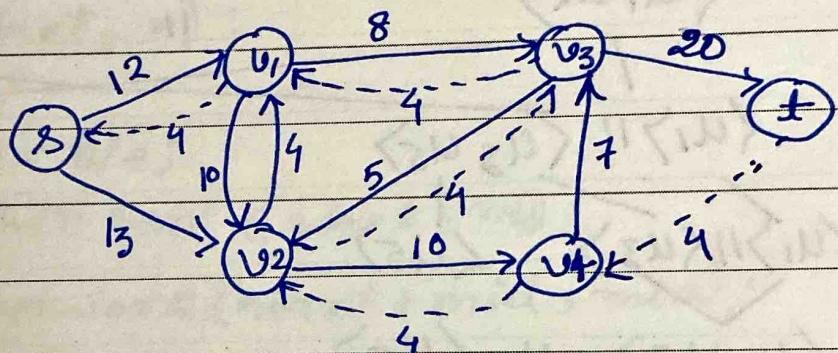


Augmenting path :  $s \rightarrow v_1 \rightarrow v_3 \rightarrow v_4 \rightarrow t$   
min capacity = 4

flow graph

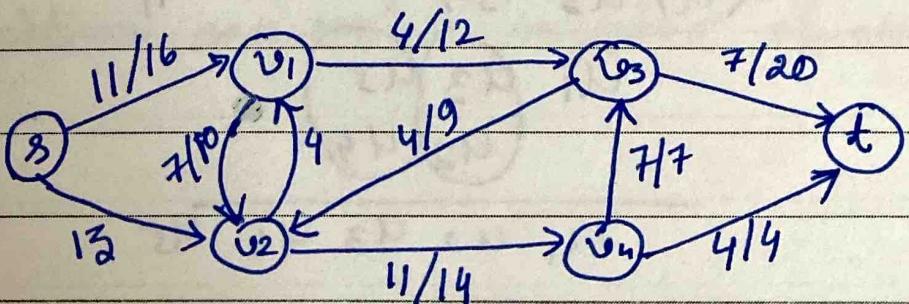


Residual graph



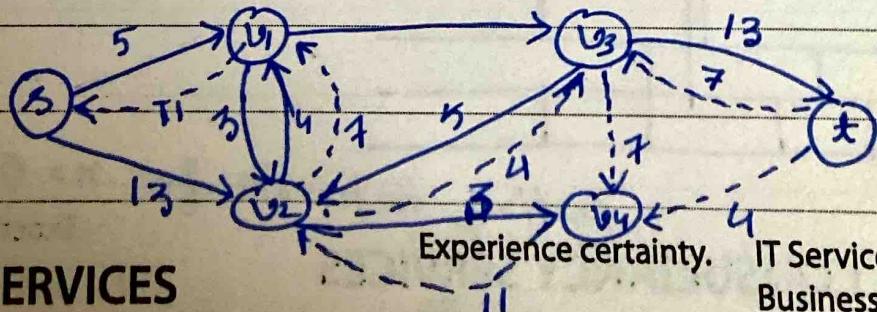
Augmenting path :  $s \rightarrow v_1 \rightarrow v_2 \rightarrow v_4 \rightarrow v_3 \rightarrow t$   
min capacity = 7

flow graph



$$\text{maxflow} = 4 + 7 = 11$$

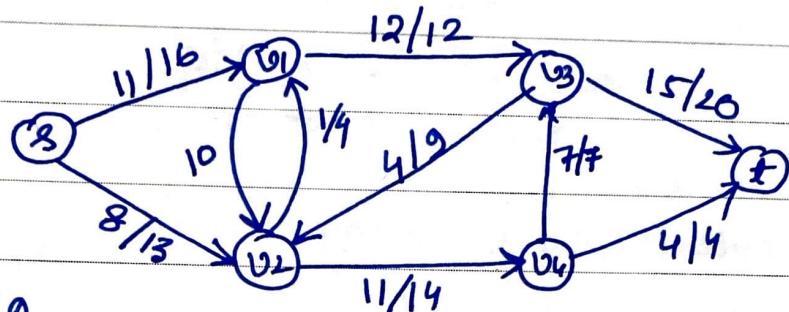
residual graph



Augmenting path : s v<sub>2</sub> v<sub>1</sub> v<sub>3</sub> t

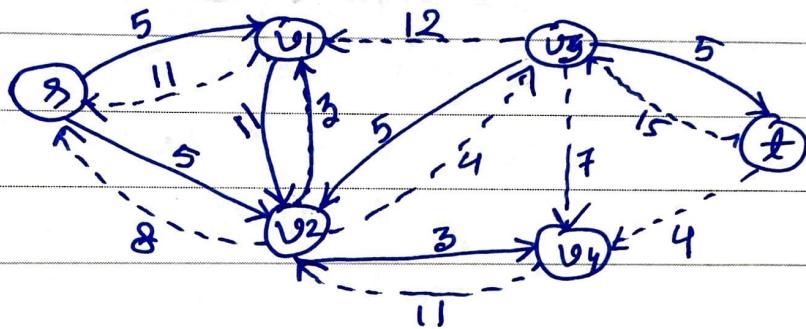
min-capacity = 8

flow graph



$$\text{maxflow} = 11 + 8 = 19$$

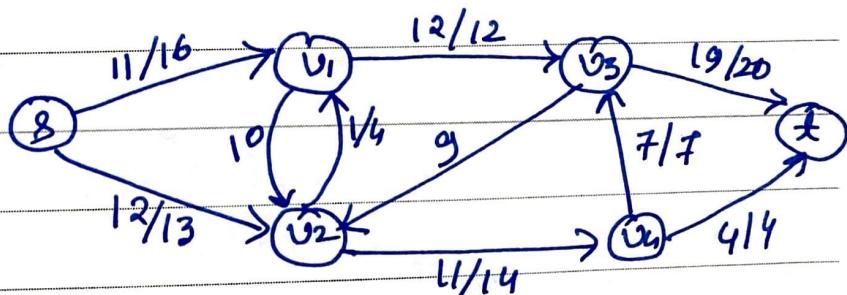
residual graph



Augmenting path : s v<sub>2</sub> v<sub>3</sub> t

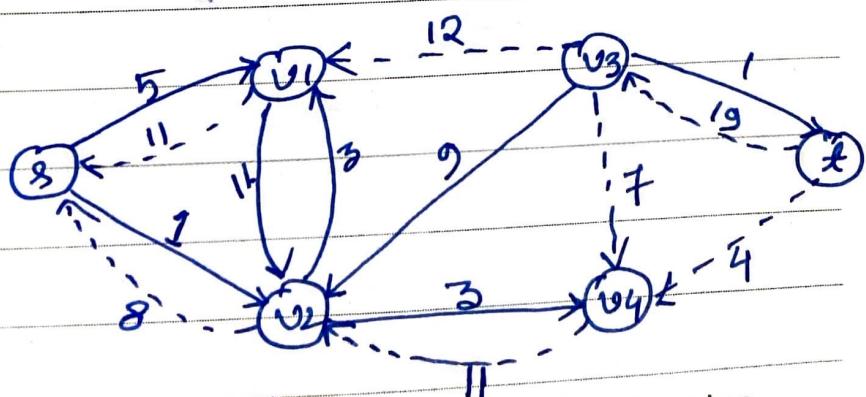
min-capacity = 4.

flow graph



$$\text{max flow} = 19 + 4 = 23$$

residual graph





bool bfs (adj, s, t, parent, V)

initialize q

for each  $v \in V$  do:

    colour [ $v$ ]  $\leftarrow$  white

    parent [ $v$ ]  $\leftarrow -1$

end for

colour [s]  $\leftarrow$  grey

enqueue (s)

while queue is not empty

    u  $\leftarrow$  dequeue()

    for  $v \in V$  do:

        if ( $adj[u][v] > 0$  and colour [v] == white)

            parent [v]  $\leftarrow u$

            colour [v]  $\leftarrow$  grey

            if ( $v == t$ )

                return true

        else

            enqueue (v)

        endif

    endif

    colour [u]  $\leftarrow$  black

end for

    return false

end while

return false

int

fordfulkerson (adj, s, t, N)

for  $u \in N$  do:

    for  $v \in N$  do:

        residual[u][v]  $\leftarrow$  adj[u][v]

    end for

end for

maxflow = 0

while bfs (residual, s, t, parent, N) is not false  
 min-capacity  $\leftarrow$  large number.

$v \leftarrow t$

while ( $v \neq s$ )

$u \leftarrow \text{parent}[v]$

    if (min-capacity > residual[u][v])

        residual[u][v]  $\leftarrow$  min-capacity

    end if

$v \leftarrow \text{parent}[v]$

end while

$v \leftarrow t$

while ( $v \neq s$ )

$u \leftarrow \text{parent}[v]$

    residual[u][v]  $\leftarrow$  residual[u][v] - min-capacity

    residual[v][u]  $\leftarrow$  residual[v][u]  
                  + min-capacity

$v = \text{parent}[v]$

end while

maxflow = maxflow + min-capacity

end while

return maxflow

Experience certainty.

IT Services  
Business Solutions  
Outsourcing