Ford-Fulkerson Algorithm

Initially, the flow of value is 0. Find some augmenting Path p and increase flow f on each edge of p by residual Capacity c_f (p). When no augmenting path exists, flow f is a maximum flow.

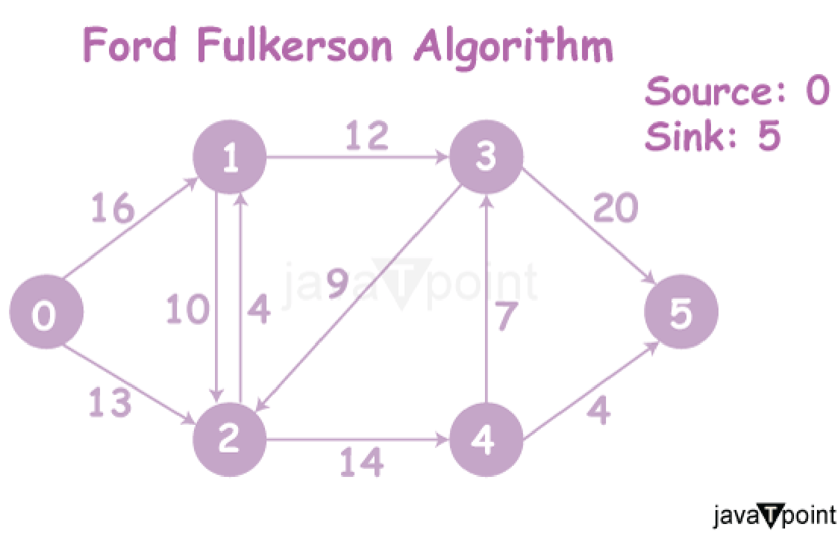
FORD-FULKERSON METHOD (G, s, t)

```
Initialize flow f to 0
while there exists an augmenting path p
do argument flow f along p
Return f
```

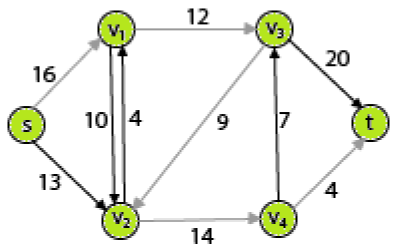
FORD-FULKERSON (G, s, t)

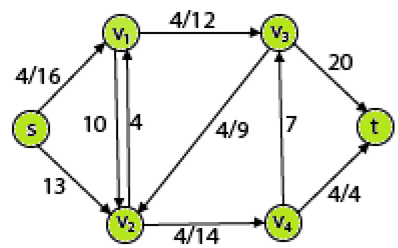
```
for each edge (u, v) ∈ E [G]
do f [u, v] ← 0
f [u, v] ← 0
while there exists a path p from s to t in the residual network G_f.
do c_f (p)←min?{ C_f (u,v):(u,v)is on p}
for each edge (u, v) in p
do f [u, v] ← f [u, v] + c_f  (p)
f [u, v] ←-f[u,v]
```

Example: Each Directed Edge is labeled with capacity. Use the Ford-Fulkerson algorithm to find the maximum flow.

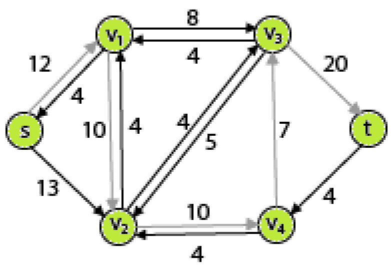


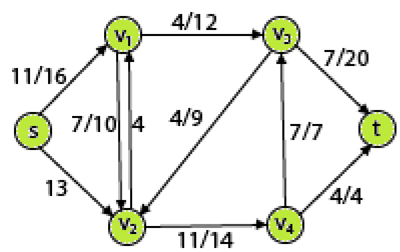
Solution: The left side of each part shows the residual network G_f with a shaded augmenting path p,and the right side of each part shows the net flow f.



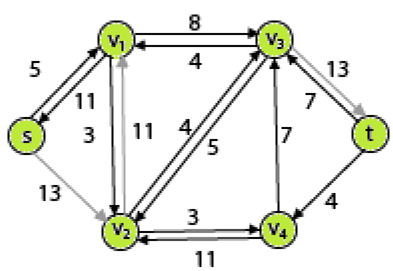


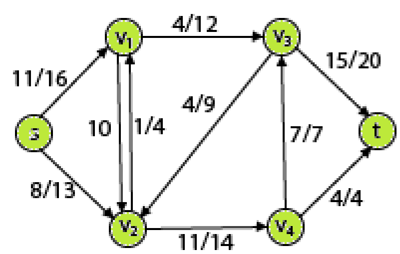
(a)





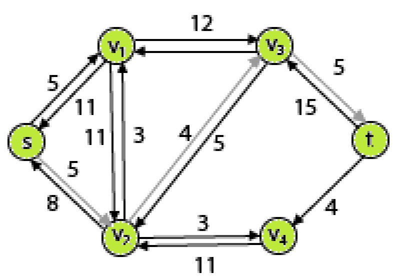
(b)



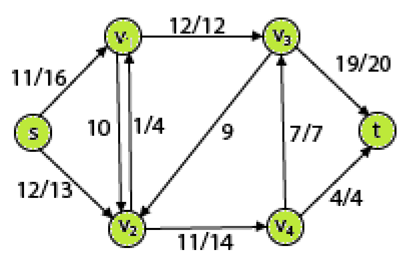


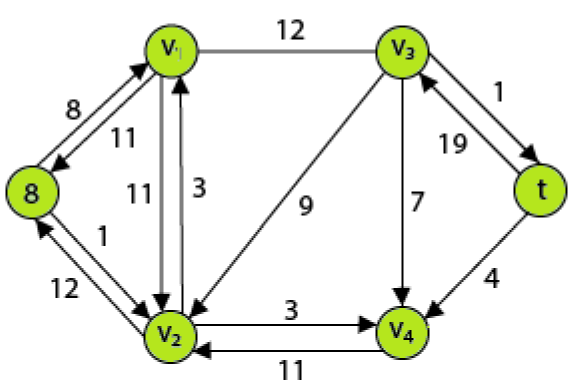
(c)

(In this , 8 is break into 7 and 1 and 7 is canclled by $v_1v_2$flow)



(d)





(e)

Now , it has no augmenting paths .So, the maximum flow shown in (d) is 23 is a maximum flow .