Page No.
Date :

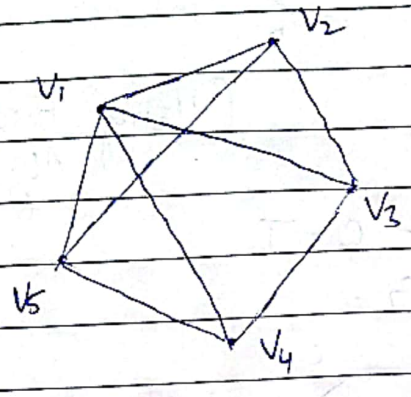
AIMAN SIDDIQUA - 2K18/MC/008

GRAPH THEORY

MC-405

CLASS TEST-3

1.



(i) There are λ choices for V_1.

(ii) V_2 and V_4 must be assigned a different color from V_1.

(iii) If V_2 and V_4 are assigned the same color then V_3 and V_5 cannot be assigned that color. V_3 and V_5 can have same or diff. colors.

(iv) If V_2 and V_4 are assigned different colors then V_3 and V_5 cannot be assigned those two colors. V_3 and V_5 can have same or diff colors

V_1 V_2 V_4 V_3 V_5

$$\lambda(\lambda-1)(\lambda-1)(\lambda-2)(\lambda-2) +$$

$$\underset{V_1}{\lambda}\underset{V_2}{(\lambda-1)}\underset{V_4}{(\lambda-1)}\underset{V_3}{(\lambda-2)}\underset{V_5}{(\lambda-3)} + \quad V_2 \text{ \& } V_4 \text{ same}, V_3 \text{ \& } V_5 \text{ different}$$

V_2 and V_4 different, V_3 & V_5 same: $\lambda(\lambda-1)(\lambda-2)(\lambda-3)(\lambda-3) +$

$\lambda(\lambda-1)(\lambda-2)(\lambda-3)(\lambda-4)$. A_4 different

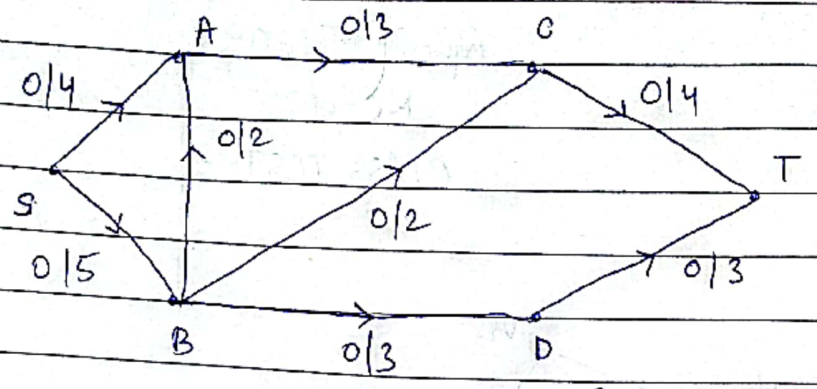
$$\lambda(\lambda-1)(\lambda-2)\left[\lambda^2-3\lambda+2+\lambda^2-4\lambda+3+\lambda^2-6\lambda+9+\lambda^2-7\lambda+12\right]$$

$$\lambda(\lambda-1)(\lambda-2)\left[4\lambda^2-20\lambda+26\right]$$

Scanned with CamScanner

Page No.
Date :

2.

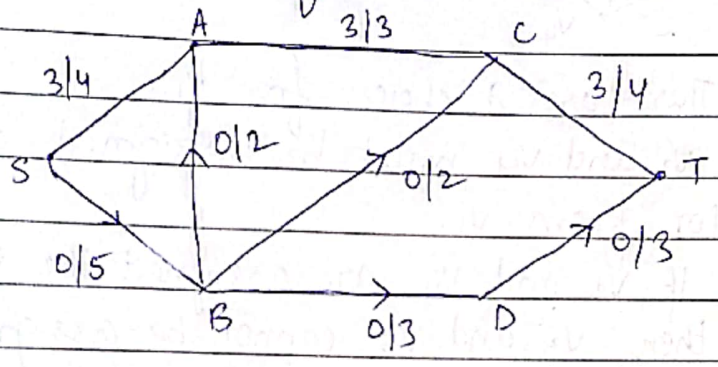


(Using Ford-Fulkerson Algorithm)

Step 1

Using path S - A - C - T

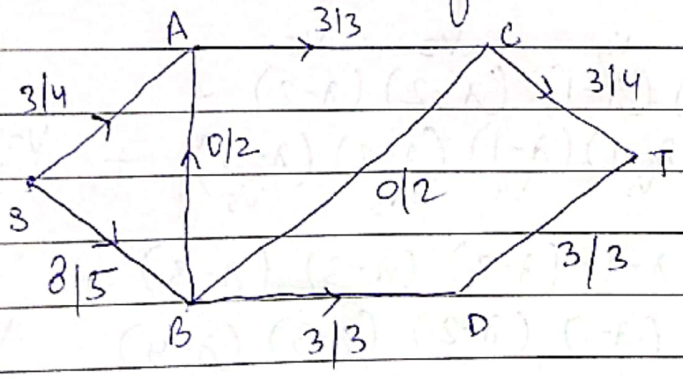
Bottleneck flow: 3.



Step 2

Using path S - B - D - T

Bottleneck flow: 3

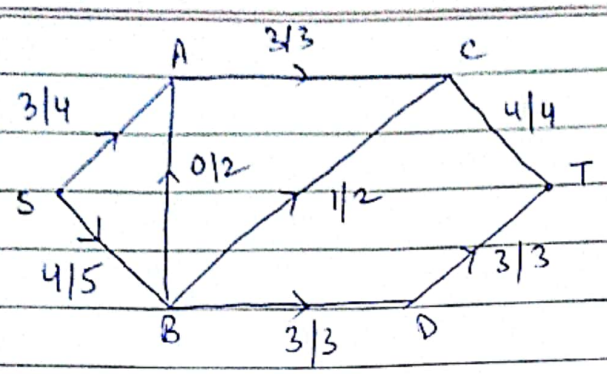


Step 3

Using path S - B - C - T

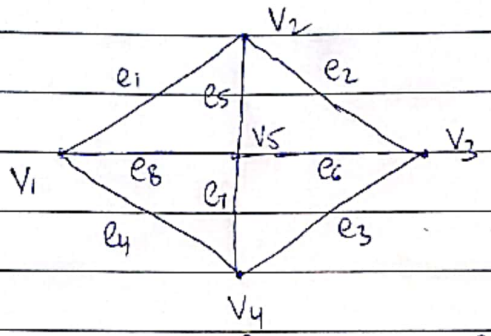
Bottleneck flow: 1

Scanned with CamScanner



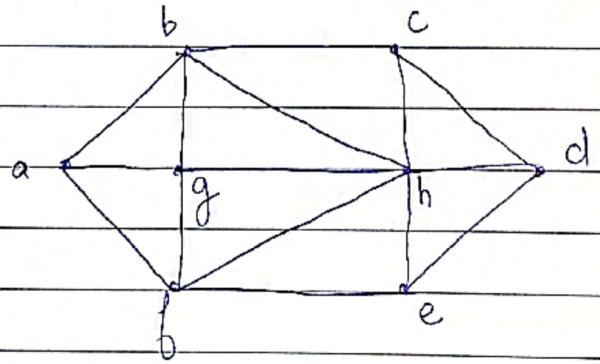
Since flow at T is maximum now, the maximum flow is $4+3=7$.

3. (a)



Cut set : $\{e_2, e_6, e_3\}$

(b)



(i) Matching with 6 vertices : {ab, gh, cd}

(ii) Perfect Matching : {ab, gh, cd, fe}

(iii) set of edge not a matching : {ab, bc, ed}

(iv) Maximum matching : {ab, gh, cd, fe}

Scanned with CamScanner