

Date: / /

Final Assignment

Name Asad Khan

ID 14944

Sub: Analysis and
Algorithm

Dept BS(CS) 4th

Date 23/06/2020

Name Asad Khan

ID 74944

page 1

Q No 1 Fill in the blanks??

i) A Vertex is a adjunction where something takes place in Graph.

ii) Node that share the same edge are called Multiple/parallel edge

iii) Two edges that are incident on same node are called adjacent edges

iv) A path between two nodes covering minimum number of nodes is called Simple path

v) A closed path with more than three edges is called cycle

vi) A node with zero in degree is called Source node

vii) A node with zero out-degree is called Sink

Name Asad Khan

ID 14944

Page 2

viii) Isolated/Null is a Graph with no pair of vertices having a common edge.

ix) Regular Graph is a Graph where each node is of the same degree.

x) Labelled Graph is a Graph where each edge is assigned a title.

Q No 2 Convert to pre- and post fix. n.l.

i) $D - Y * (F / D)$
prefix Notation.

$D - Y * (F / D)$

⇒ $- D Y * (F / D)$

⇒ $- D * Y (F / D)$

⇒ $- D * Y (\bullet / F D)$

Name Asad Khan

ID

14944

page 3

post-fix notation

$$\underline{D} - \underline{Y} * (\underline{F/D})$$

$$\underline{D} \underline{Y} * (\underline{F/D}) -$$

$$\underline{D} \underline{Y} (\underline{F/D}) * -$$

$$\underline{D} \underline{Y} (\underline{F/D}) * -$$

$$iii) \underline{T / W \wedge R + S * M - Y \wedge K}$$

$$+ \underline{T / W \wedge R} \underline{S * M - Y \wedge K}$$

$$+ \underline{T / W \wedge R} - \underline{S * M} \underline{Y \wedge K}$$

$$+ \underline{T} \underline{W \wedge R} - \underline{S * M} \underline{Y \wedge K}$$

$$+ \underline{T} \wedge \underline{W R} - * \underline{S M} \wedge \underline{Y K} \quad \underline{\text{Ans}}$$

post fix notation:

$$\underline{T / W \wedge R + S * M - Y \wedge K}$$

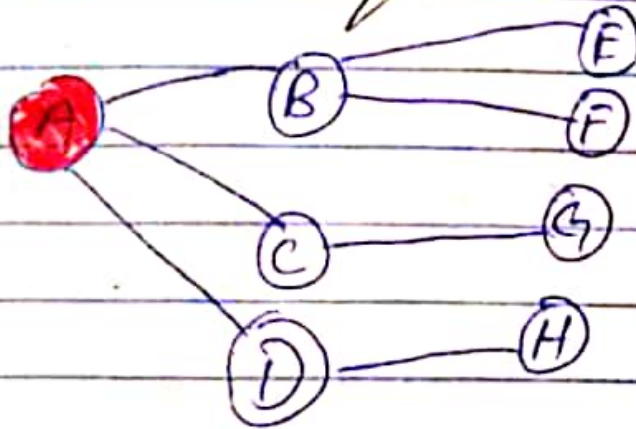
$$\underline{T / W \wedge R} \underline{S * M - Y \wedge K} +$$

$$\underline{T \wedge R} / \underline{S * M} \underline{Y \wedge K} - +$$

$$\underline{T \wedge R} / \underline{S M} * \underline{Y \wedge K} - + \quad \underline{\text{Ans}}$$

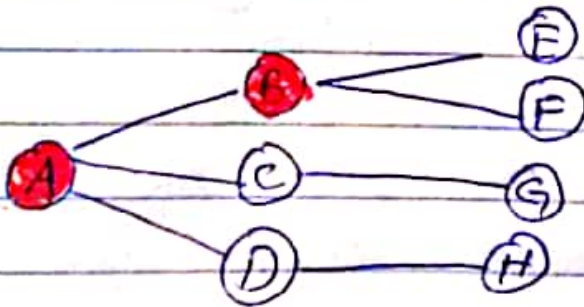
Ques 3.

Breadth first Search techniques..



1) Root "A" is our current working node (CWN)
Mark 'A' visited.

Add 'A' to the output Sequence -



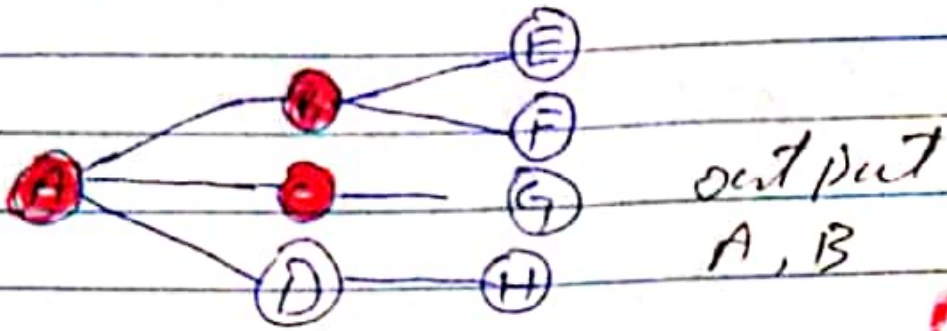
Output Sequence: A

2) A is adjacent to B, C and D
Select 'B' and push it into Q.



Mark 'B' visited

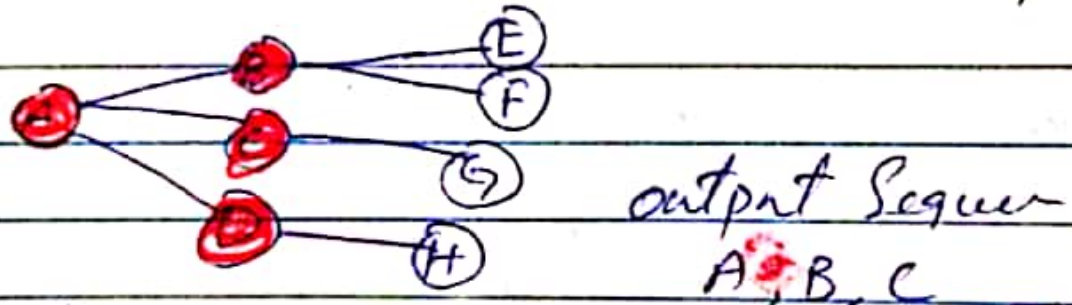
Add 'B' to the output



3) Accessing 'C' from CNV i.e.
 (A) push 'C' into Q.

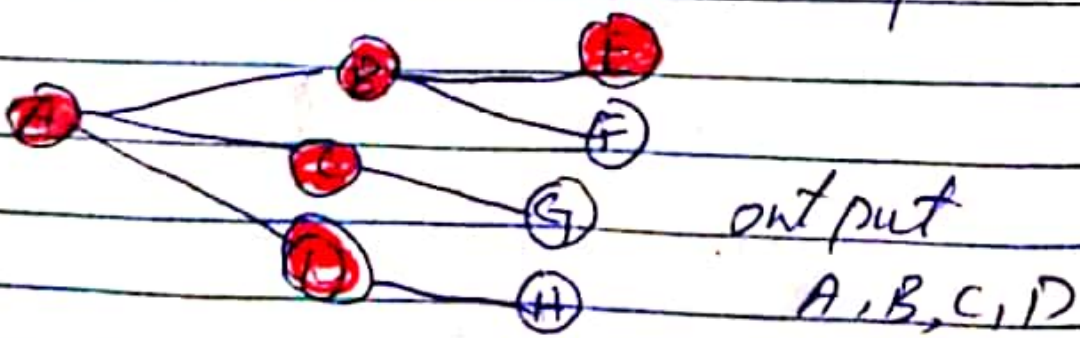


Mark 'C' visited
 add 'C' to the output sequen—



4) from CNV i.e A, the adjacent node 'D' is selected

'D' is marked visited
 'D' is added to the output sequen



Name : Asad Khan

ID : 14944

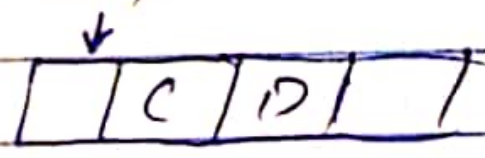
page 6

Now as there are no more nodes adjacent to CNM i.e 'A'

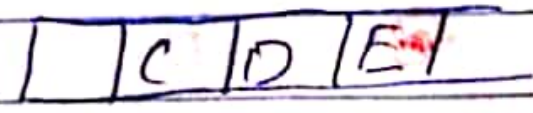
So update CNM

Select 'B' as CNM

Pop it from Q.

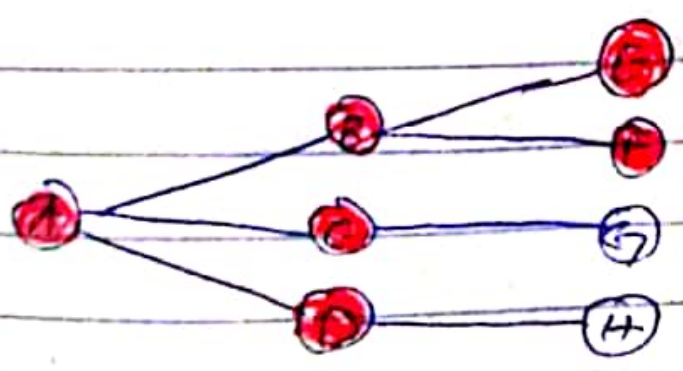


'B' is adjacent to E and F. Select E and push it into Q.



Add 'E' to the output Sequence

Mark E visited.

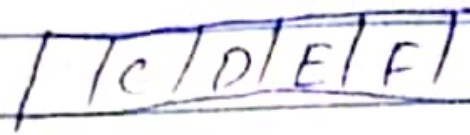


output Seq
A, B, C, D, E

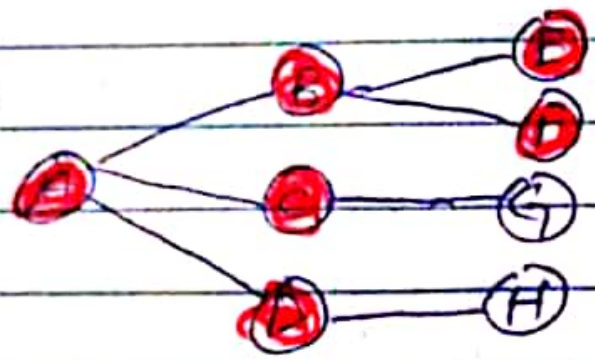
Name Asad Khan

ID 14944 page 7

6 from CNV i.e 'B' access 'F'
push F into Q

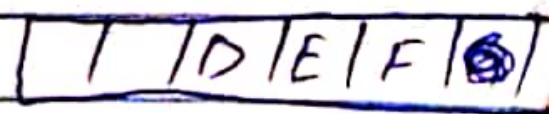


Mark 'F' visited
Add F to the output Sequence -



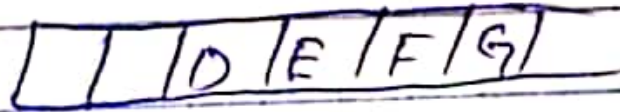
output
A, B, C, D, E, F.

As There are no more nodes adjacent
to CNV i.e 'B' So update
CNV again
Select 'C' is popped from Q



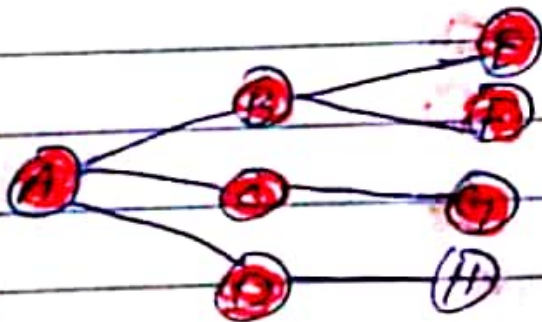
⑦ Now 'c' is adjacent to G
 select 'G' and push it into the

Q



'G' is marked visited

'G' is added the output sequence.

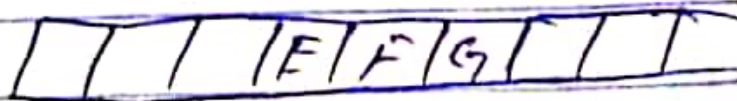


output Seq
 A, B, C, D, E, F, G

Again there are no more nodes adjacent to CNN i.e 'C', so update CNN

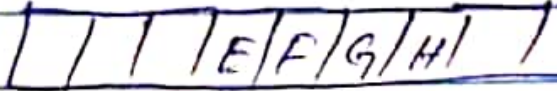
* 'D' is selected as new CNN

'D' is popped from Q.



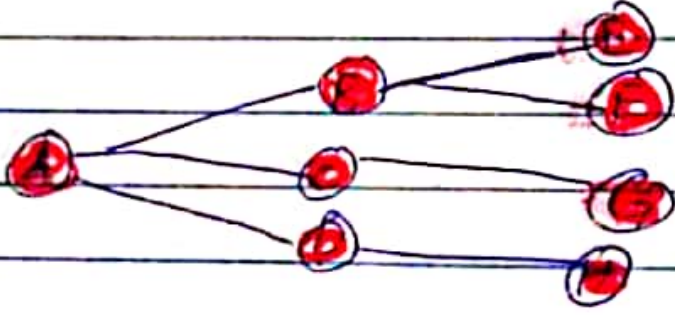
8) from CWN i.e 'D' adjacent node is 'H'

'H' is selected as ^{and} new CWN
Bos push it into the Q



'H' is marked visited

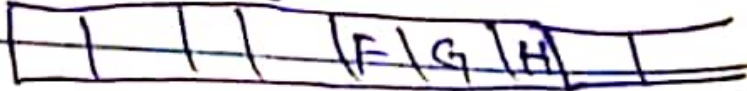
'H' is added to output sequen



output A, B, C, D, E, F, G, H.

Now CWN is update to 'E'

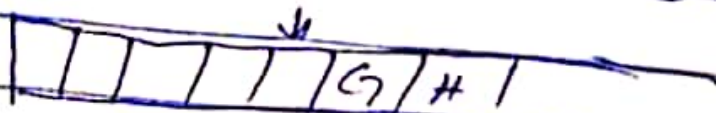
'E' is popped from Q



No adjacent node to 'E'

again CWN is update to 'F'

'F' is popped from Q



Asad Khan

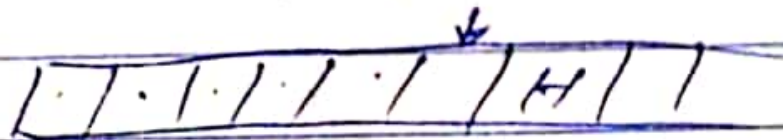
14944

page 10

No adjacent node to (F)

Now, again CNV is update to (G)

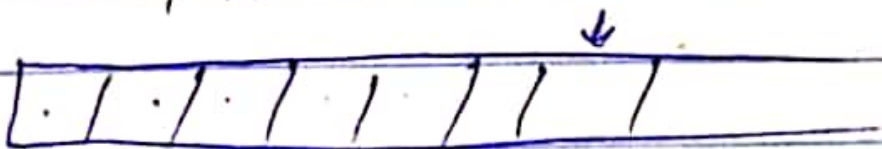
(G) is popped from Q



No adjacent node to (G)

Now again CNV is update to (H)

(H) is popped from Q.



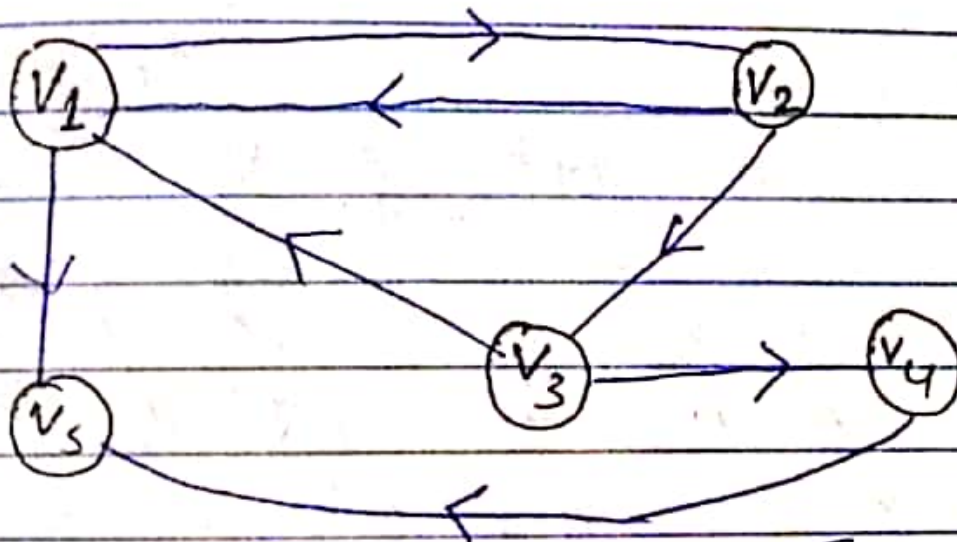
Q is now empty so Breadth first Search stops.

Name Asad Khan

ID 14944

page 11

Qno 4 Design adjacency Matrix
from given Graph



Number of nodes = $n = 5$
order of $A = n \times n$
 5×5

its mean the matrix we will
design now will be 5 rows and
5 columns. like

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} & a_{15} \\ a_{21} & a_{22} & a_{23} & a_{24} & a_{25} \\ a_{31} & a_{32} & a_{33} & a_{34} & a_{35} \\ a_{41} & a_{42} & a_{43} & a_{44} & a_{45} \\ a_{51} & a_{52} & a_{53} & a_{54} & a_{55} \end{bmatrix}$$

Name Asad Khan

ID 14944

page 12

Now we have to find the values of a_{11} a_{12} a_{13} etc.

a_{11} mean v_1 to v_1 and it's zero because no loop of v_1 .

$a_{11} = 0$: As there is no edge from v_1 to v_1 ,

$a_{12} = 1$: As there is an edge from v_1 to v_2

$a_{13} = 0$ As there is no edge etc.

And the final matrix is given below.

	v_1	v_2	v_3	v_4	v_5	out degree
v_1	0	1	0	0	1	2
v_2	1	0	1	0	0	2
v_3	1	0	0	1	0	2
v_4	0	0	0	0	1	1
v_5	0	0	0	0	0	0

in-degree

2 1 1 1 2

Total degree
7

Name Asad Khan

ID 24944

Page 13

Qno 5

	V_1	V_2	V_3	V_4	V_5
V_1	0	1	0	1	1
V_2	1	1	1	0	0
V_3	0	0	1	1	0
V_4	1	1	0	1	0
V_5	0	0	0	0	1

As order of A is equal to $= m \times m$
 5×5

that is why Number of nodes = 5
 let's the nodes be:

V_1, V_2, V_3, V_4, V_5

