

NAME

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Subject

Design & Analysis
of Algorithms

Dept

BS (CS)

Q1

- i) Vertex
- ii) Multiple / Parallel Edge
- iii) Adjacent edges
- iv) Simple Path
- v) Cycle
- vi) Source node
- vii) Sink
- viii) Solated or null graph
- ix) Regular Graph
- x) Labeled Graph.

Q2 Convert the following from In-fin to Pre-fin & Post-fin notations.

i) $D - Y^* (F/G)$

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Pre - fin

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

$$- \underline{Dy * (F/G)}$$

$$- D * y (F/G)$$

$$- D * y (1/FG)$$

Post - fin

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

$$Dy * (F/G) -$$

$$Dy (F/G) * -$$

$$Dy (FG) * -$$

$\frac{D}{H}$

M-B
ID

T

R

T

+

+/T

+/T

Post

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Q2

ii)

$$T/W^R + S * M - Y^K$$

Pre-fin:-

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

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

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

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

Post fin:-

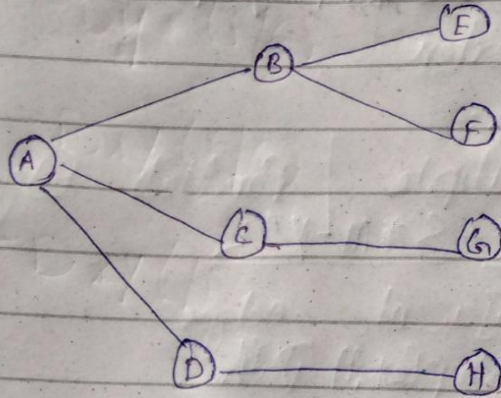
$$\underline{T/W^R + S * M - Y^K}$$

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

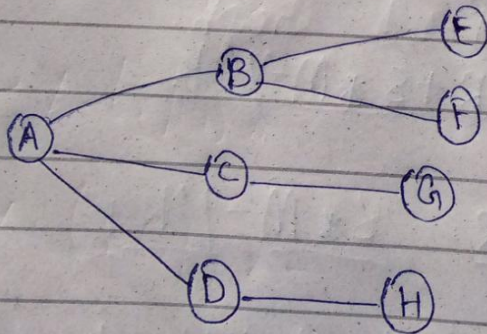
$$\underline{T/W^R} / \underline{S * M} \quad \underline{Y^K} - +$$

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

Q3



- 1) Add root A to the output sequence
Mark A visited
A is CNW



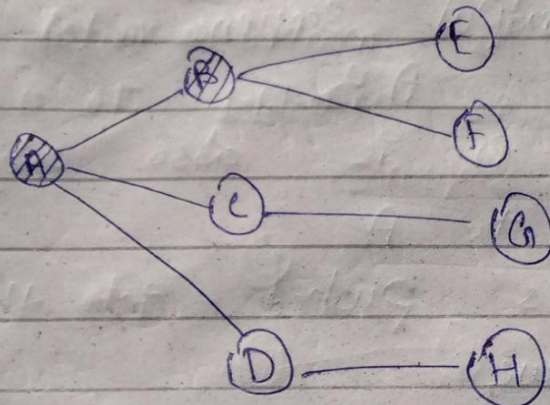
Output sequence
A

- 2) A is adjacent to B, C & D
Select B & Push it into queue.

B		
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Add B to the output sequence

Mark B visited



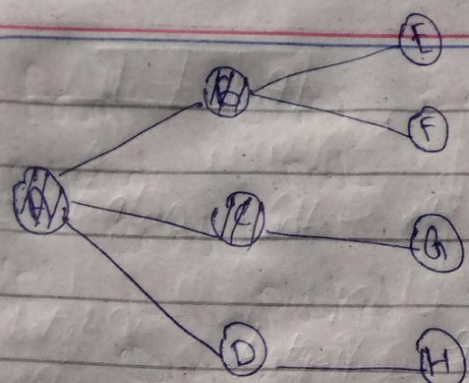
Output Sequence
A, B

3) from CWN i.e 'A' the adjacent node is 'C' 'C' is pushed into the Queue.

B		C
---	--	---

'C' is marked visited

'C' is added to output sequence.



output Sequence

A, B, C

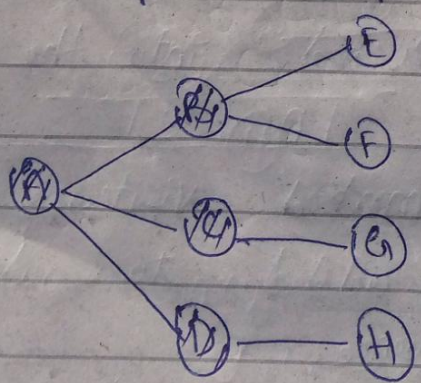
4) As 'D' is also adjacent to A

D is pushed into the Queue

B | C | D

D is mark visited

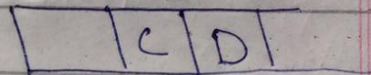
D is added to the output Sequence.



Output sequence
A, B, C, D

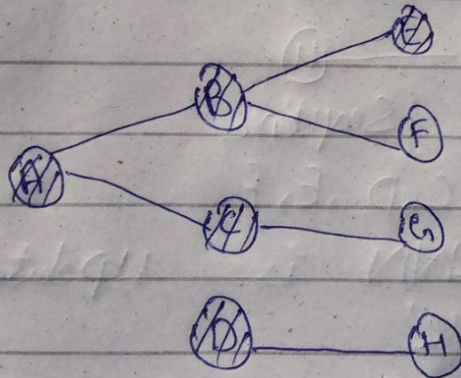
Now CWN is updated
'B' is selected as now
CWN

B is Popped from Queue



5) B is subject to E & F

E is add to output
sequence



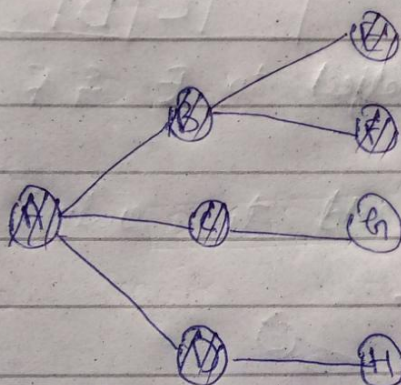
Output sequence
A, B, C, D, E

3) From CWN in 'B' the adjacent node 'F' is selected.

'F' is pushed into the Queue.

'F' is marked visited

'F' is added to output Sequence.

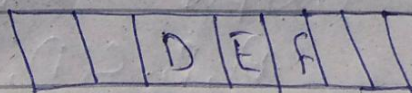


output Sequence

A, B, C, D, E, F

Now CWN is updated to 'e'

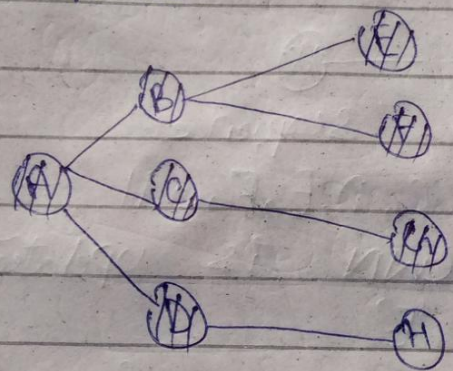
'e' is Popped from Queue



7) From CNV in 'e' the adjacent node is 'G'

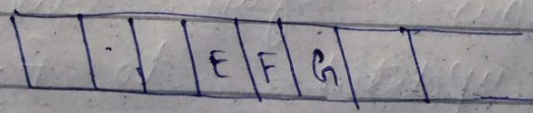
'G' is pushed into the Queue.

'G' is added to output Sequence.

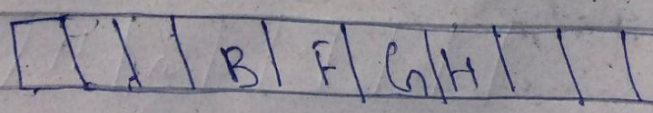


A, B, C, D, E, F, G

Now CNV is updated to 'D'
'D' is popped from Queue.

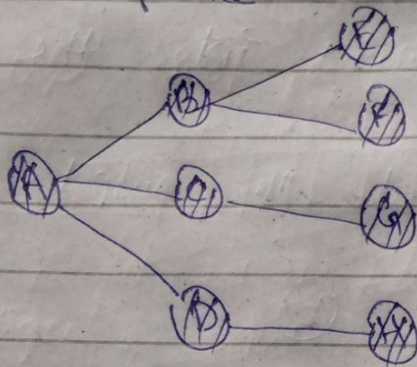


'H' is adjacent node to 'D'
'H' is Popped to Queue



'H' is visited
'H' is added to output

Sequence



Output sequence:

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

Now cwn is updated
to 'E'

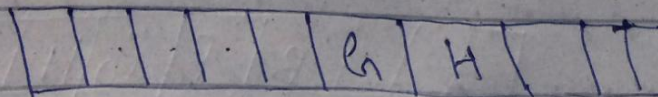
'E' is Popped from Queue.



No adjacent node to 'H'

Now again cwn is
updated to f.

'f' is Popped from Queue



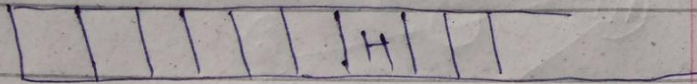
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No adjacent node to 'f'

Now again cwn is updated
to 'G'

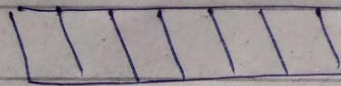
'G' is popped from Queue.



No adjacent node to 'G'

Now again cwn is updated
to 'H'

'H' is popped from Queue.



No adjacent node to 'H'

Queue is empty, so BFS
stops.

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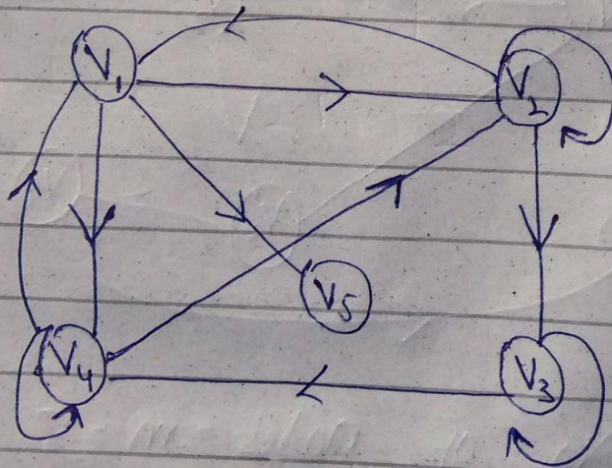
Q5

$$A = \begin{bmatrix} 0 & 1 & 0 & 1 & 1 \\ 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 \\ 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

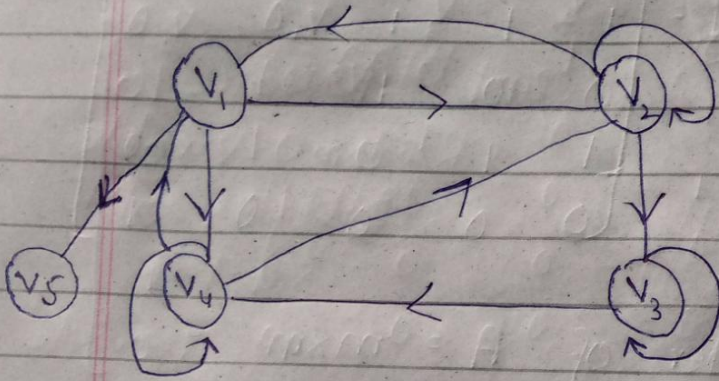
$$\begin{aligned} \text{Order of } A &= m \times m \\ &= 5 \times 5 \\ &= 25 \end{aligned}$$

No of Nodes = 5

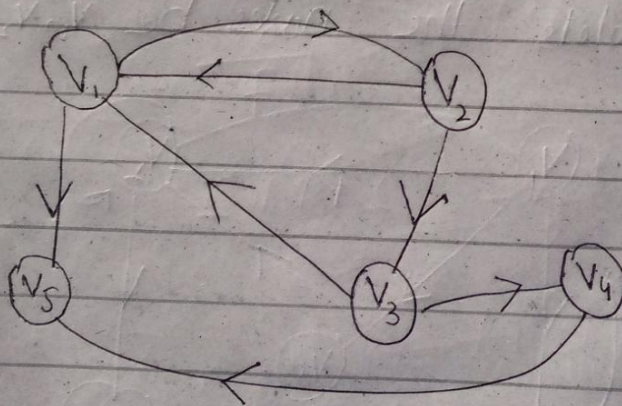
lets the nodes be v_1, v_2, v_3, v_4



MR



Q4



No of nodes = $m = 5$
order of $A = m \times m$
 $= 5 \times 5$
 $= 25$

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v_1	v_2	v_3	v_4	v_5
0	1	0	0	1
1	0	1	0	0
1	0	0	1	0
0	0	0	0	1
0	0	0	0	0

Out-degree

2
2
2
1
0
<hr/>
7

In-degree 2 1 1 1 2