

①

Day: MTWTFSS

Date: \_\_\_/\_\_\_/\_\_\_

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Id	14472
Subject	Design and analysis of algorithm.
Department	BS (CS)
Semester	4 <sup>th</sup>

Q (1)

Ans:

Answers :-

- (i) Vertex
- (ii) Multiple / parallel edge
- (iii) Adjacent edges.
- (iv) Simple path
- (v) Cycle.
- (vi) Source node.
- (vii) Sink.
- (viii) Isolated or Null graph.
- (ix) Regular graph.
- (x) Labeled graph.

(2)

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Q (2)

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

Pre-fix

D - Y \* (F/G)

- D Y \* (F/G)

- D \* Y (F/G)

- D \* Y ( /FG )

Post-fix

D - Y \* (F/G)

D Y \* (F/G) -

DY ( F/G ) \* -

DY (FG / ) \* -

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

Pre-fix

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

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

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

+ T^WR - \* SM^YK

Post-fix

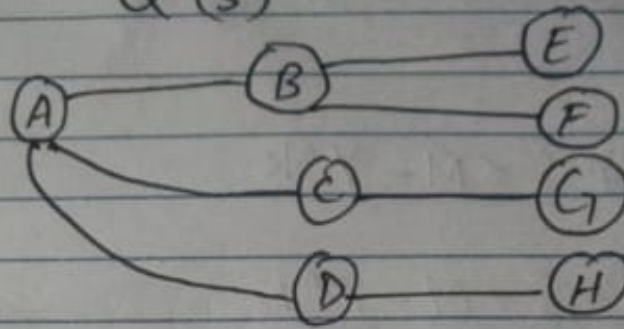
T/W^R + S \* M - Y^K

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

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

TWR^ / SM \* YK^ - +

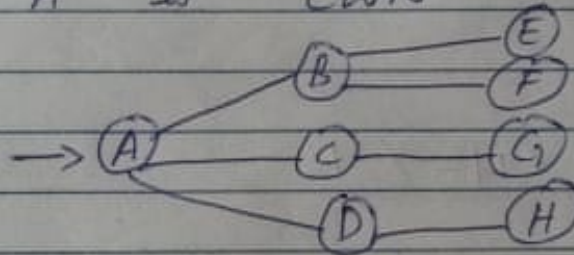
Q (3)



① \* Add root A to the output sequence

\* Mark A visited.

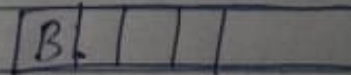
\* A is CWN



output sequence  
A

② \* A is adjacent to B, C and D

\* select B and push it into queue.



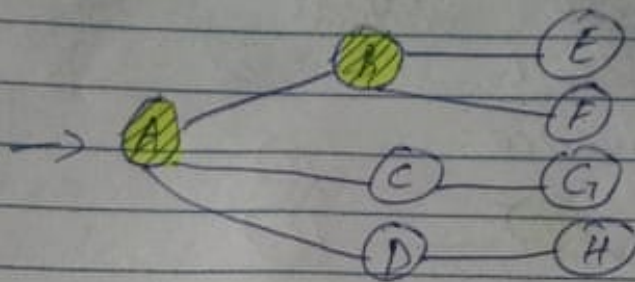
\* Add B to the output sequence

\* Mark B visited

(5)

Day: M T W T F S

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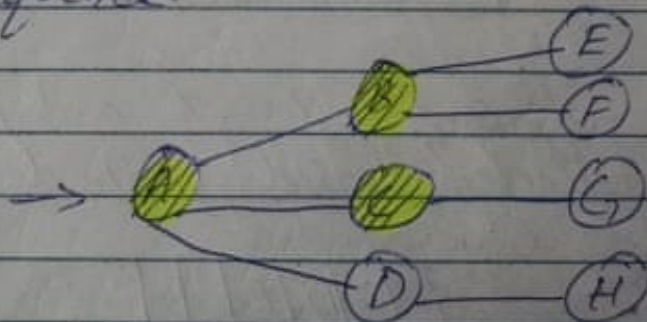


output sequence  
A, B

- (3) \* A 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.

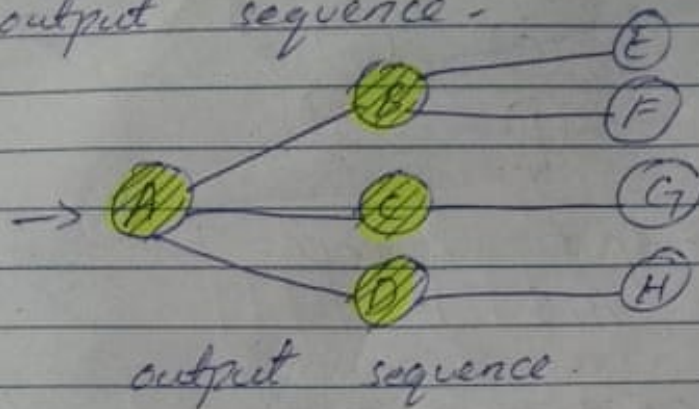


output sequence  
A, B, C

- (4) \* As 'D' is also adjacent to 'A'.  
\* D is pushed into the Queue

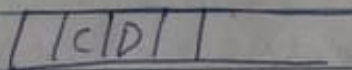
B | C | D | |

- \* D is mark visited.
- \* D is added to the output sequence.

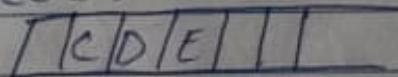


A, B, C, D

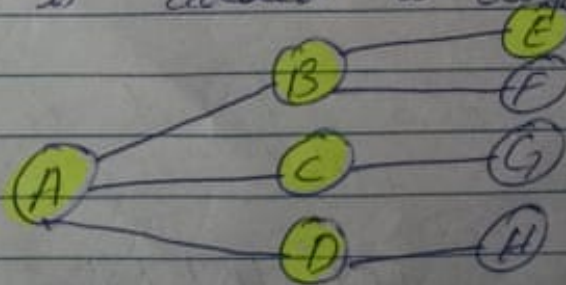
- \* Now CWN is updated.
- \* 'B' is selected as new CWN
- \* 'B' is popped from Queue.



- (5) \* B is adjacent to E and F
- \* 'E' is selected and pushed into the Queue.

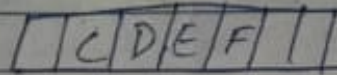


- \* 'E' is marked visited.
- \* 'E' is added to output sequence.

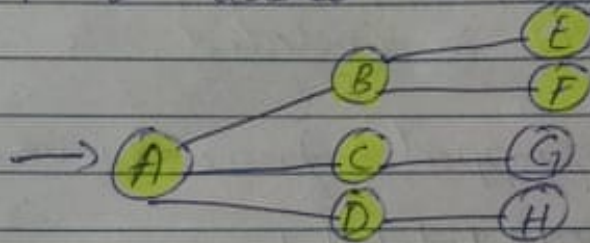


output sequence  
A, B, C, D, E

- ⑥ \* from CWN i.e 'B' the adjacent node 'F' is selected.
- \* 'F' is pushed into the Queue.

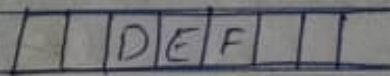


- \* 'F' is marked visited.
- \* 'F' is added to output sequence.

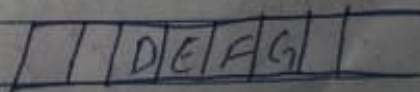


output sequence.  
A, B, C, D, E, F

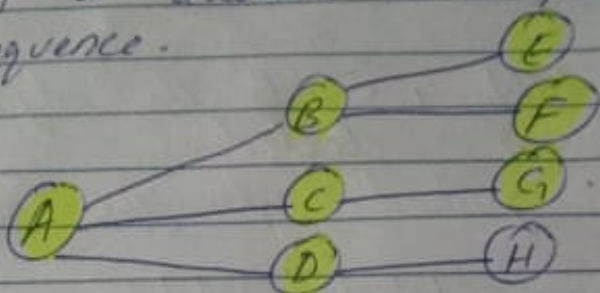
- \* Now CWN is ~~update~~ updated to 'C'
- \* 'C' is popped from Queue.



- ⑦ \* from CWN i.e 'C' is the adjacent node is 'G'
- \* 'G' is pushed into the Queue



\* 'G' is marked visited.  
 \* 'G' is added to output sequence.

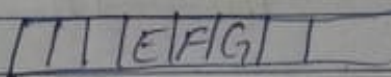


output sequence.

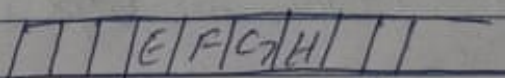
A, B, C, D, E, F, G

\* Now CWN is updated to 'D'

\* 'D' is popped from Queue.

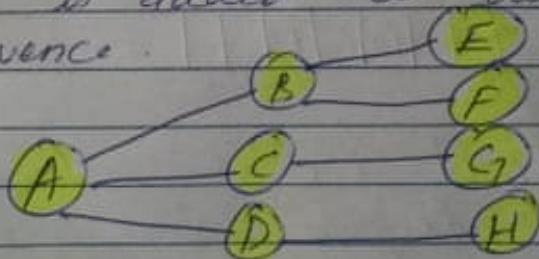


⑧ \* 'H' is adjacent node to 'D'  
 \* 'H' is pushed to Queue.



\* 'H' is mark visited.

\* 'H' is added to output sequence.



output sequence.

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



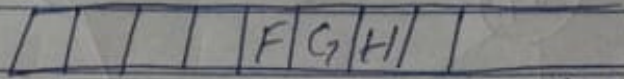
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\* Now CWN is added to 'E'.

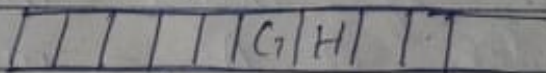
\* 'E' is popped from Queue.



\* No adjacent node to 'H'.

\* Now again CWN is updated to 'F'.

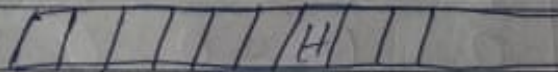
\* 'F' is popped from Queue.



\* No adjacent node to 'G'.

\* Now again CWN is updated to 'G'.

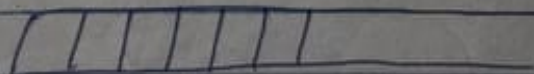
\* 'G' is popped from Queue.



\* No adjacent node to 'H'.

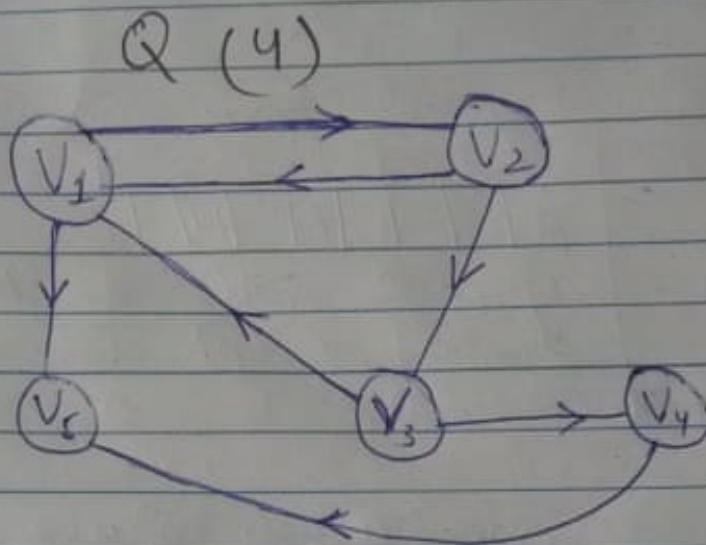
\* Now again CWN is updated to 'H'.

\* 'H' is popped from Queue.



\* No adjacent node to 'H'.

\* Queue is empty, so BFS stops.



Number of nodes =  $m = 5$   
 Order of  $A = m \times m$   
 $= 5 \times 5$

						out degree
$v_1$	0	1	0	0	1	<del>2</del> 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	(7)

Q (5)

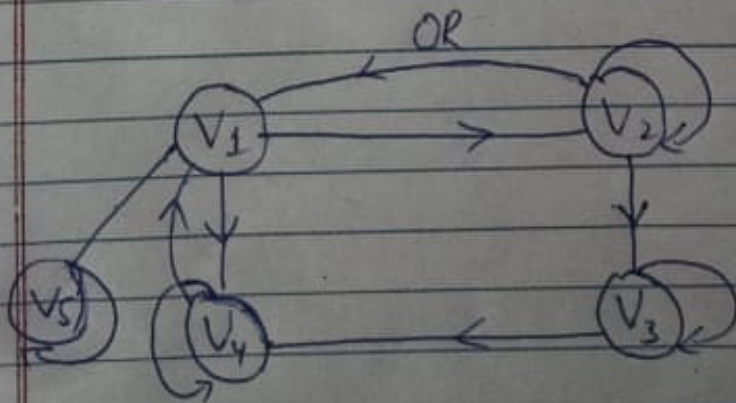
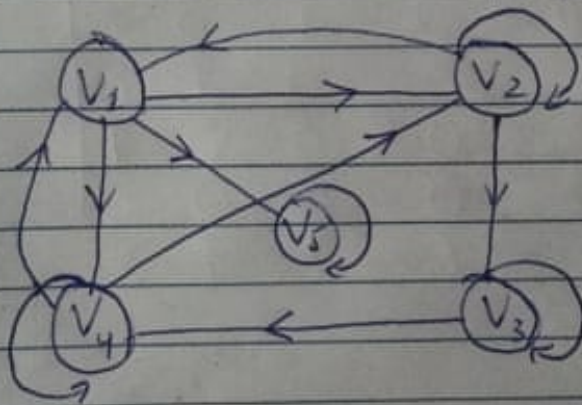
$$A[] = \begin{bmatrix} 0 & 1 & 0 & 1 & 1 \\ 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 \\ 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

As

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

no. of nodes = 5

let the nodes be  $V_1, V_2, V_3, V_4$  &  $V_5$



the required graph.