

①

Name	Manahil Khan
ID	14525
Subject	Design analysis & algorithms
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INSTRUCTOR	Muhammad Adil

Note: Attempt all questions.

Q No#1

part (a)

Q = How would you be defining a linked list?

\* linked list:-

A linked list is a list whose elements may not occupy continuous memory locations & elements are connected by means links between them.

\* link is actually address.

\* each element of the list is called a node.

\* each node has two fields

1 info field.

2 link field

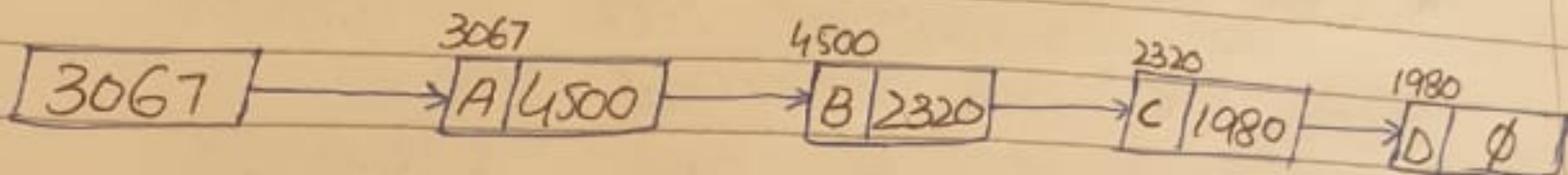
\* A LL in which nodes can be accessed only in forward direction.

(2)

part (B)

ONE way linked list:-

Execution:-

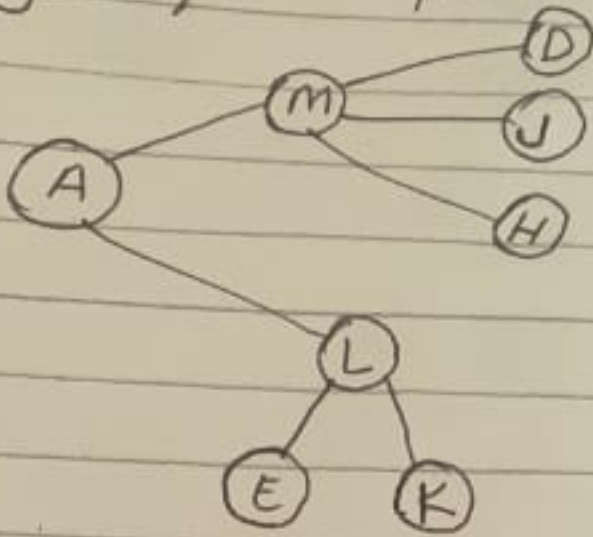


- ①  $p \leftarrow \text{getnode}(3067)$
- ②  $\text{Head} \leftarrow p$
- ③  $\text{info}(p) \leftarrow \text{data}$   
 $3067 \leftarrow A$   
 $4500 \leftarrow B$   
 $2320 \leftarrow C$   
 $1980 \leftarrow D$
- ④  $\text{link}(p) \leftarrow \phi$   
 $(3067) (4500) (2320) (1980)$
- ⑤  $q \leftarrow p (3067) (4500) (2320) (1980)$
- ⑥  $Y \cdot Y \cdot Y \cdot Y \cdot N$
- ⑦  $p \leftarrow \text{getnode}(4500) (2320) (1980)$
- ⑧  $\text{link}(q) \leftarrow p (4500) (2320) (1980)$
- ⑨  $\text{goto } 3$
- ⑩  $\text{exit}$

3

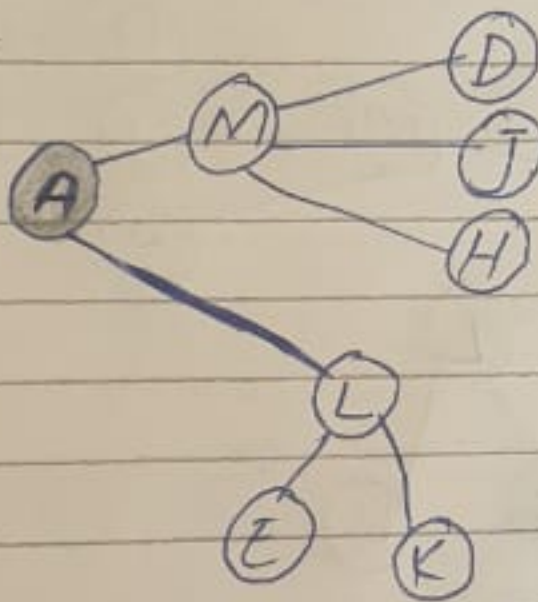
Q NO # 2

Q. Apply depth-first technique on the given tree



Solution:-

Step 1:-

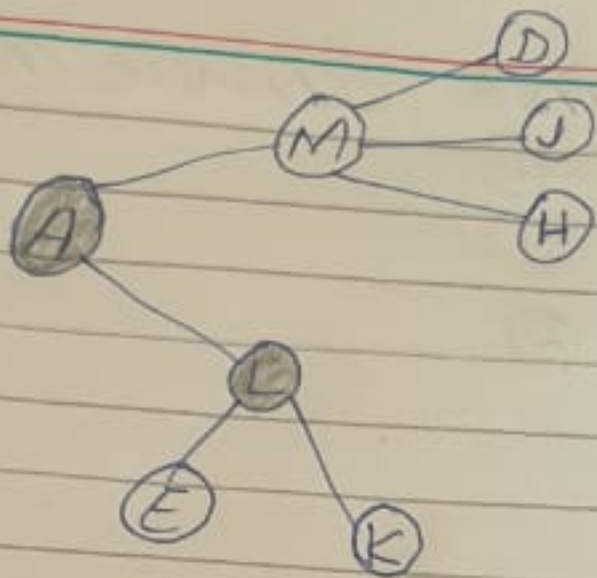


[A]

\* output Sequence:-  
A,

Step 2:-

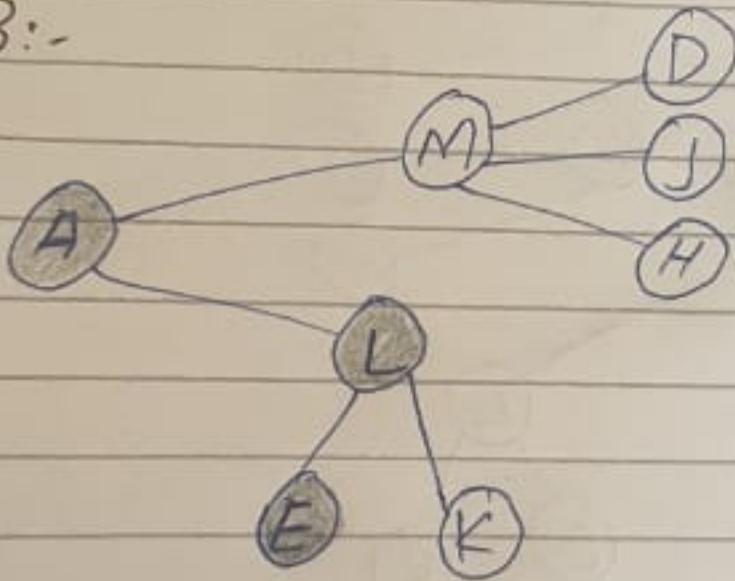
(4)



A | L

\* Output Sequence  
A, L

Step 3:-

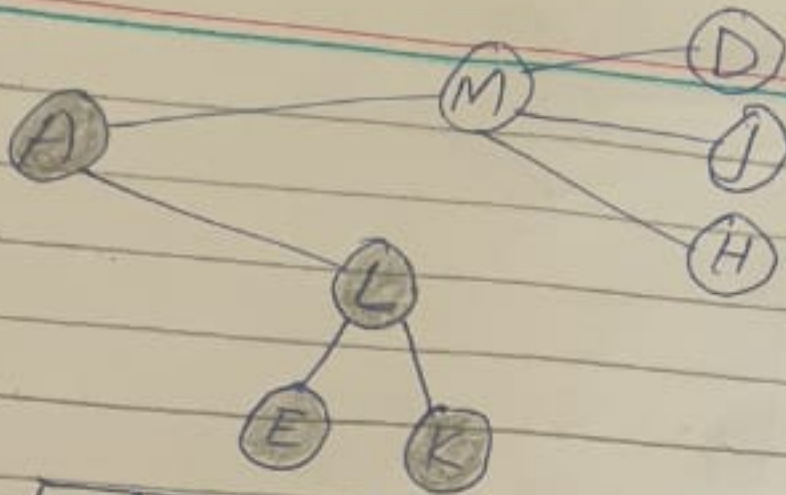


A | L | E | |

\* Output Sequence:-  
A, L, E

Step 4:-

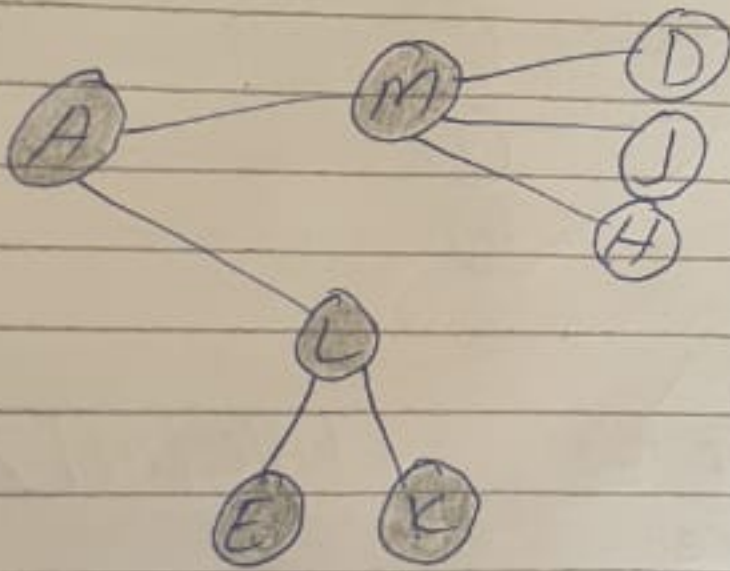
(5)



A L E K

\* Output Sequence :-  
A, L, E, K

Step 5

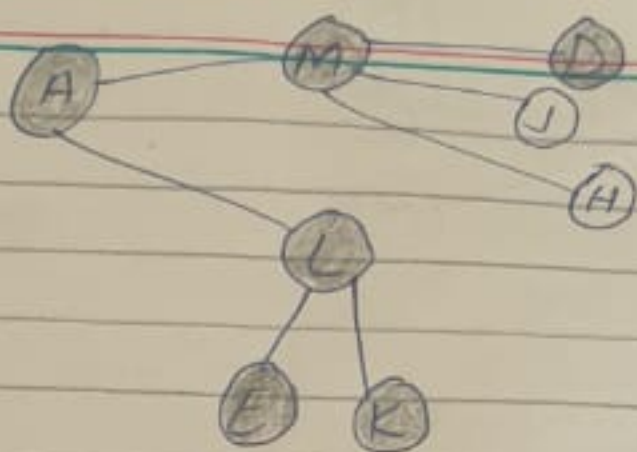


A L K M

\* Output Sequence :-  
A, L, E, K, M

Step 6 :-

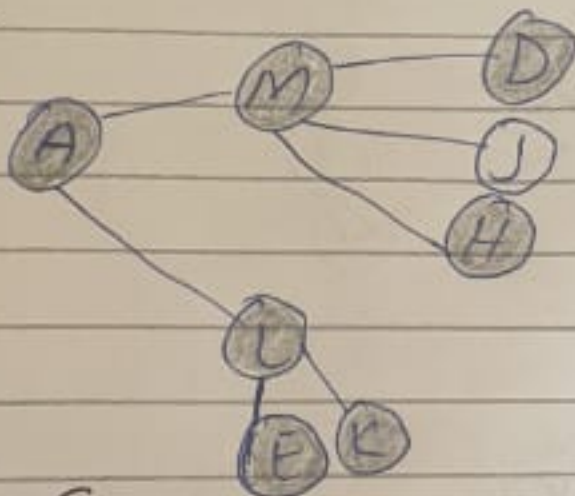
6



[A | L | M | D | ]

\* Output Sequence:-  
A, L, E, K, M, D

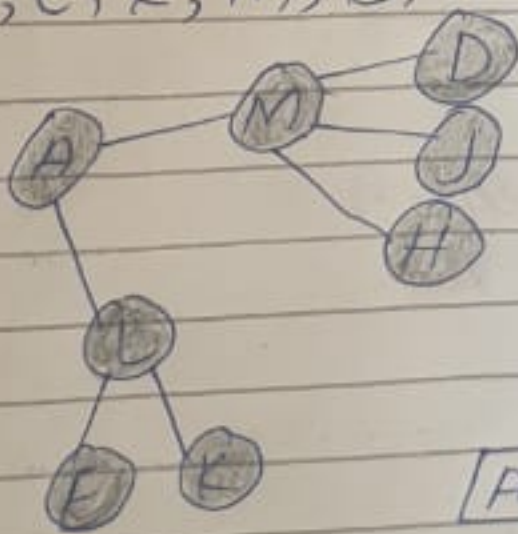
Step 7:-



[A | L | M | ~~D~~ | H | ]

\* Output Sequence:-  
A, L, E, K, M, D, H

Step 8:-



[A | L | M | ~~H~~ | J | ]

\* Output Sequence:-  
A, L, E, K, M, D, H, J

(7)

### Q NO #3

Q. How would you be a defining a Queue?  
Give some real life example Queues.

#### \* Queues:-

A Sequential list in which elements are inserted from one end & are retrieved from the other end is called Queues.

\* The end from ~~to~~ elements can be inserted is known as rear of the Queues.

\* The end from where elements can be retrieved is known as front of the queue.

\* Working principal is like "First in first out last in last out"

#### \* examples:-

\* people waiting to submit fees at bank window.

\* people in book shop, first customer should be served first.