IQRA NATIONAL UNIVERSITY

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Semester   :   4th

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Assignment   : Mid Term

Subject   :   Design and Analysis

Of Algorithm

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Design and Analysis of
Algorithm

Con(v):

Ans linked list:-

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

x each elements of a linked list
is called node.

* Each node has at least two
fields / parts

① Info field:

Info field keeps data

② link field:-

link field keeps address
of next node.

. link field of last node is kept
Ø.

Head:

A pointer "head" is used
to keep the address of 1st node

Types of linked list:-

There are three
types of linked list

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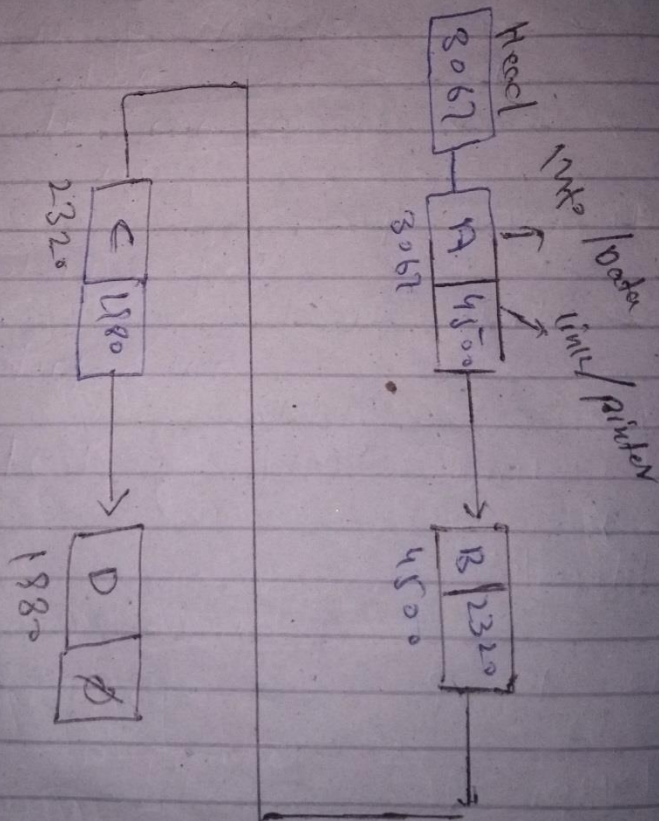
① : one   way   linked list

② Two   way   linked list.
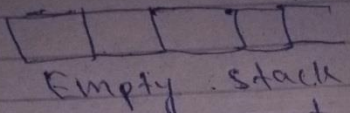
③ Circular   linked   list.
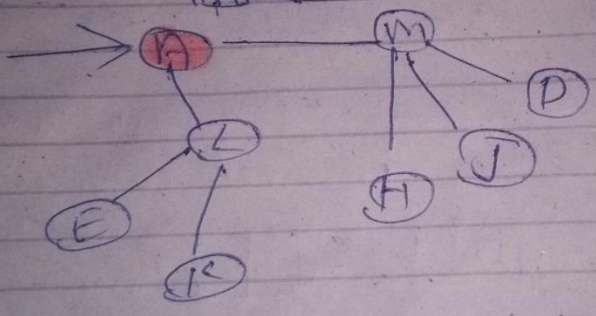
Q1
Ans (b)   Diagrammatic one   way linked
list :

Head
3067

link/data   link/pointer

3067
A | 4500

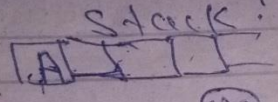B | 2320
4500

C | 4500
2320

D | ∅
1880

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Q2:-

Ans Depth - first Technique

Solution:

first we take an empty stack:

Empty stack

① Start from root node "A"
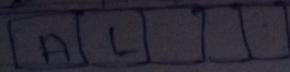- Highlight this node "A"
- Now we push "A" into stack.

output Sequence
"A"

② Now "A" is adjacent to "M" and "L"
- We follow alphabetically. we select "L"
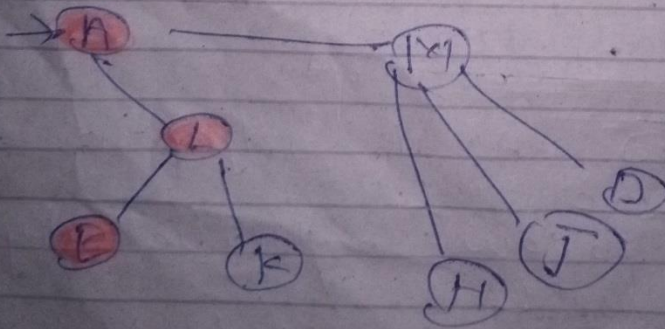- Highlight this node "L"
- Now we push "L" onto the top of stack.

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| A | L | | | |

Output Sequence :

A, L"

③ now "L" is adjacent to "E"
and "K"

• we follow alphabetically. we
Select "E"

• Highlight this node "E"

• Now we push "E" on the
Top of

| A | L | E | | |

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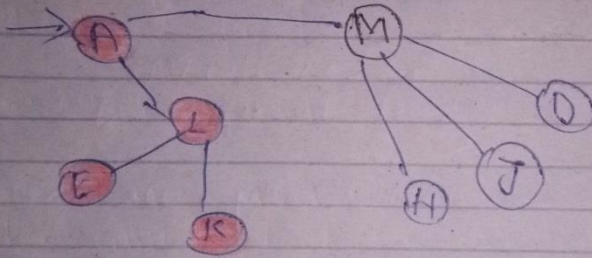
Output Sequence:

A . L . E .

④ As "E" is leaf, so we pop it
from stack.

- We get back to "L".

- Now we Push "K" on top of
the Stack.

- highlight node "K".

| A | L | E̶ K |

Output Sequence:

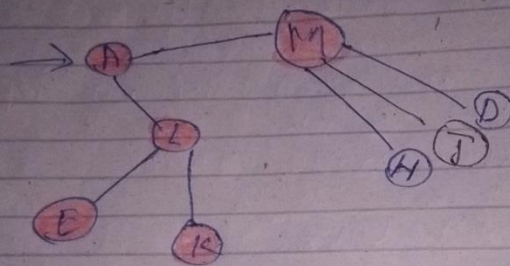A, L, E, K,

⑤ "K" is also a leaf, so we
pop it from Stack.

- we get back to "L".

- As "L" has two no other are
adjacent elements, which we
are Pushed. So we get
back to "A".

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- We push 'M' on top of the stack
- Highlight this node "M"
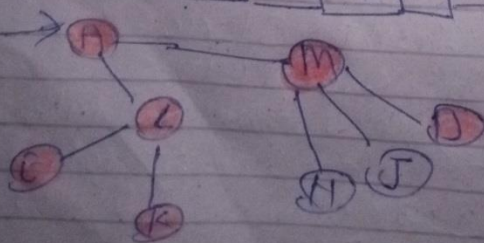
A	L	K	M

Output Sequence:
$$A, L, E, K, M,$$

6 "M" is adjacent to "D", "J" and "H"

- We follow alphbetically, we select "D"

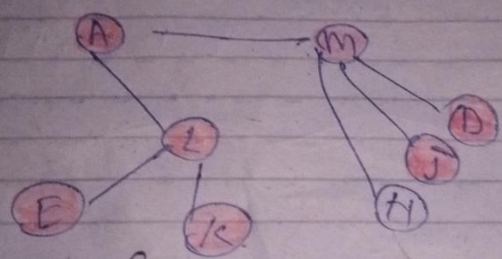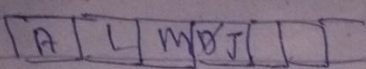- We push "D" on the top of the stack.
- Highlight this node 'D'

A	L	M	D	

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output Sequence

A, L, E, K, M, D

⑦ As "D" is leaf, so we pop it from stack.
· we get back to "M"
· Now we push "J" on top of the Stack.
· Highligh this node "J"
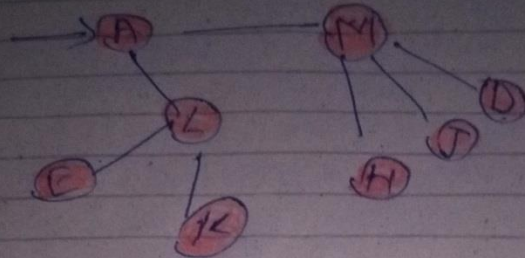
A	L		M	D	J			

output Sequence:

A, L, E, K, M, D, J

⑧ "J" is also leaf so we pop it from stack.

· we get back to 'm"

· Now we push "H" on top of the Stack.

· Highlight this node "H"

| A | L | m | J | M | | |

Output Sequence

A, L, E, K, M, D, J, H

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③

Ans   Queue:-

A Sequential list in which elements are inserted from one end and are deleted /retrieved from other end is called queue.

Rear:- The end from where an elements can be inserted is called rear of the Queue.

Front The end from where an element can be deleted/retrived is called front of the queue.

Working Principal:

The working principal of a queue is.

" first In- first out" or

" last in - last out"

Memory Representation

* A linear array a[] is used to represent a queue.

* Two variables "F" and "R" are used to denote front and Rear. of a[].

Examples:-

* Automobiles waiting to pass through a signal make up a queue.

* people waiting to sub mit bills at a bank is window.

* Patients waiting out side the doctor's clinic

* Luggage checks by luggage checking machine.

The End