

Page #

4

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CLASS ID :- 14937

SUBJECT :- Design & Analysis
of Algorithm

DEPARTMENT :- BS(CS)

SEMESTER :-

4th

Question / Answer

Question No (1)

Q: How would you be defining a Linked list?

Answer:

Defination:-

A linked list is a sequence of data structures, which are connected together, via links.

Linked lists is a sequence of links which contains items.

Each link contains a consist to another link.

Explanation:-

Linked lists are among the simplest and most common data structures. They can be used to implement several other common abstract data types, including list, stacks, queue though it is not uncommon to implement those data structure directly without using a linked list as the basis. "A linked list is a list whose elements may not occupy continuous memory locations and whose element are connected by means of links between them

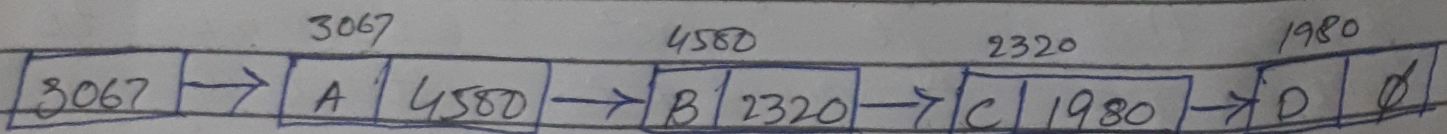
- * Each element of a linked list is called a node.
- * Each node has at least 2 fields.
 - i) info field :- keep data
 - ii) Link field :- keep address of link field to next node.
- * A pointer "Head" is used to keep the address of 1st node.

←————→
Question No (1) Part (B)

Q:- Design a Diagrammatic One way Linked List for the given data.

Node #	Node Address	Node data
1	3067	A
2	4580	B
3	2320	C
4	1980	D

One way linked list :-
Execution :-



① $P \leftarrow \text{getnode}(3067)$

② $\text{Head} \leftarrow P$

(3) info (P) ← data

3067 ← A

4580 ← B

2320 ← C

1980 ← D

(4) Link (P) ← ∅

(3067) (4580) (2320) (1980)

(5) q ← P (3067) (4580) (2320) (1980)

(6) Y.Y.Y.Y.N

(7) P ← getnode (4580) (2320) (1980)

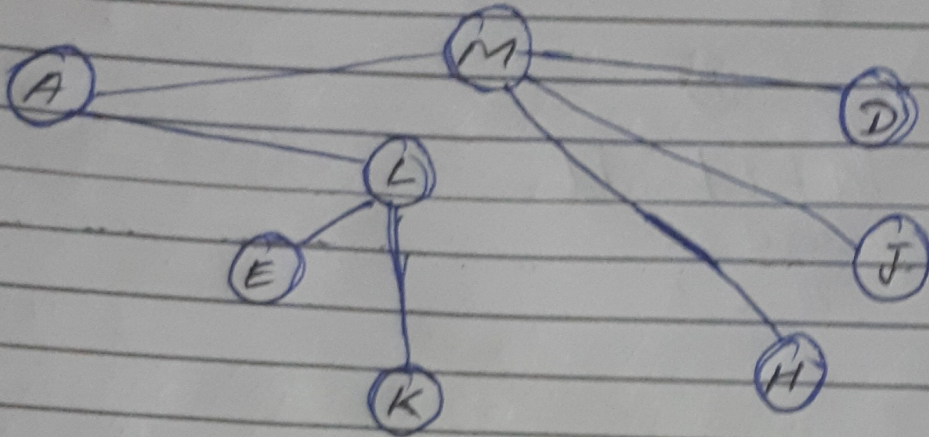
(8) Link (q) ← P (4580) (2320) (1980)

(9) goto 3

(10) exit.

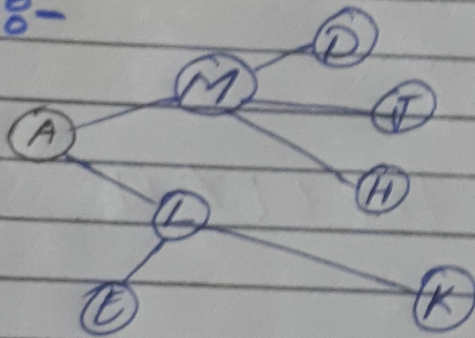
Question # 2

Q: Apply Depth-First Technique on the given Tree



Solution:-

Step (i)

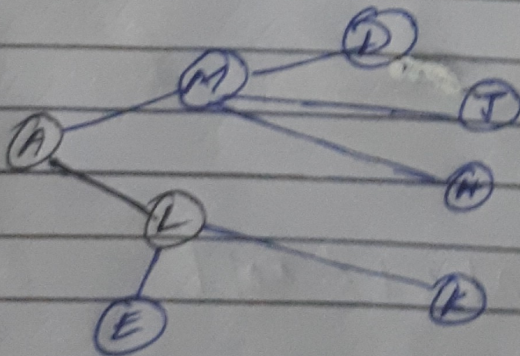


A

Output sequence :-

A,

Step (ii)

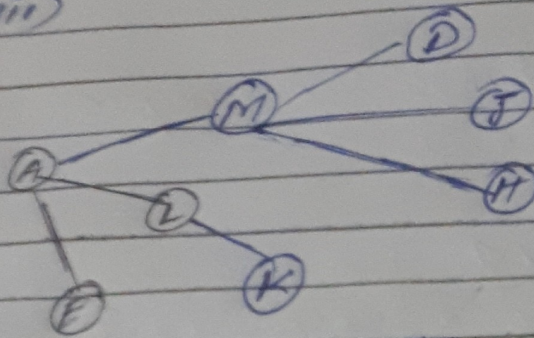


A | L

Out sequence :-

A, L

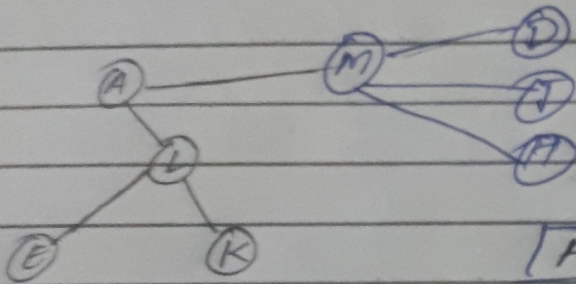
Step (iii)



A | L | E |

Output sequence :-
A, L, E

Step (iv) :-

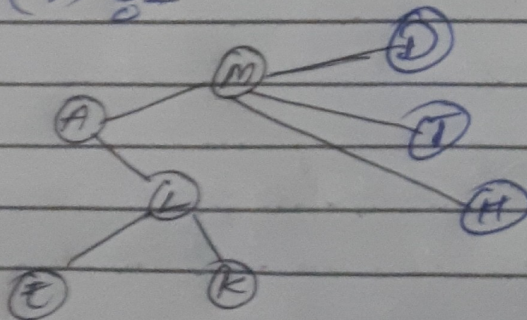


A | L | E | K |

Output sequence :-

A, L, E, K

Step (v) :-

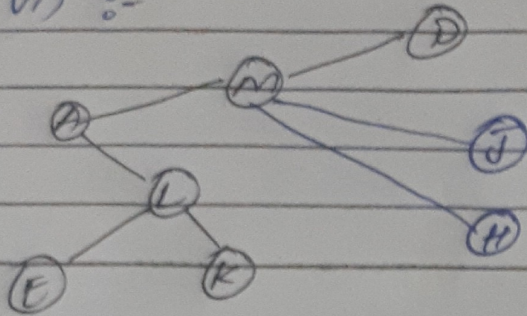


A | L | E | K | M |

Output sequence :-

A, L, E, K, M

Step (vi) :-

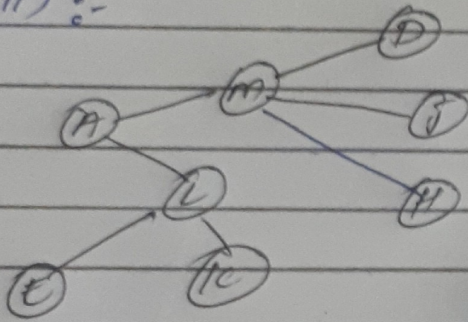


A | L | M | D |

Output sequence :-

A, L, E, K, M, D

Step (vii) :-

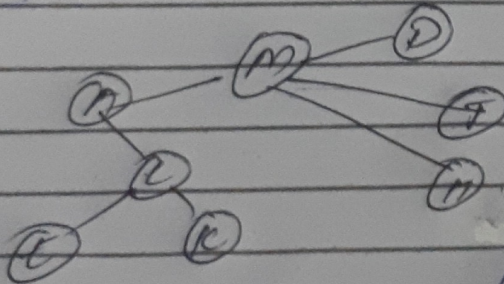


A | L | M | D | H |

Output sequence :-

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

Step (viii) :-



A | L | M | H | J |

Output sequence :-

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

Question # 3

Q:- How would you be defining a Queue?
Give some real life examples of Queues.

Answer:- **Queue:-**

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

* The end from where an element can be inserted is called Rears of the queue.

The end from where an element can be retrieved is called front of the queue

"First in first out"

Examples:-

A car is waiting to pass through a signal.

People waiting to submit their bills at bank window.