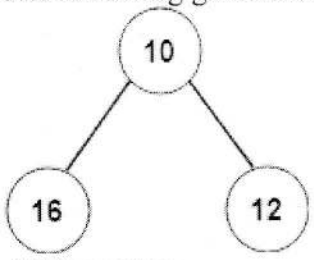
RETEST EXAMINATION (OLD Syllabus)
Semester: 4th
Subject code: CO 402
Subject: Data Structure Using C
Full Marks: =70 (part A - 25 + Part B - 45)
Duration: 3 hours

Instructions:
Questions on Part A are compulsory
Attempt any Five Questions from Part B

	PART-A **MARK-25**	
Questions no.	Questions	Marks
Question 1	**State TRUE or FALSE**	1x5=5
a)	Removing items from an empty stack is termed as stack underflow.	
b)	Recursion is the name given to the phenomenon of defining a function in terms of other function.	
c)	Sparse Matrix also known as Dense Matrix.	
d)	Dynamic memory management techniques allow to allocate additional memory space or to release unwanted space at run time.	
e)	Graphs are Linear data structure.	
Question 2	**Define the following Terms**	1x 5 =5
a)	Polish notation.	
b)	Priority queue .	
c)	Leaf node .	
d)	Heap.	
e)	Calloc.	
Question 3	**Choose the most appropriate answer**	1X 10=10
a)	An array m is declared as int m[3][4] ; Array m has a) 2 elements b) 4 elements c) 12 elements a) 16 elements	

b)	Linked lists are best suited for a) relatively permanent collections of data. b) the size of the structure and the data in the structure are constantly changing. c) both of the above situation. d) none of above.	
c)	The Data structure that can be used to implement priority queue is a) Array b) List c) Heap d) Tree	
d)	If the given input array is sorted or nearly sorted, the algorithm that gives the best performance is a) Insertion sort b) Selection sort c) Quick sort d) Merge sort	
e)	If the elements "P", "Q", "R" and "S" are placed in a Stack and are deleted one at a time, the order they will be removed is a) PQRS b) SRQP c) SQRP d) PQSR	
f)	The following given tree is an example of  a) Binary tree b) Binary search tree c) Fibonacci tree d) AVL tree	
g)	The matrix that has most of the elements (not all) as Zero is a) Identity Matrix b) Unit Matrix c) Sparse Matrix d) Zero Matrix	

h)	Merge sort uses a) Divide-and-conquer b) Backtracking c) Heuristic approach d) Greedy approach	
i)	Heap can be used as a) Priority queue b) Stack c) A decreasing order array d) Normal Array	
j)	In general the number of orders of traversal applicable to a binary tree is a) 1 b) 4 c) 2 d) 3	
Question 4	**Fill up the blanks.**	1x 5 = 5
a)	Process of deleting an element from stack is called _____.	
b)	The end where deletion of elements can take place in a queue is called _____ .	
c)	The process of writing the operators of an expression either before their operands or after them is called _____.	
d)	Linked list is a collection of data element called nodes ,each pointing to the next node by means of _____ .	
e)	Number of edges incident on a vertex/node is the _____ of the node.	

PART-B
MARK-45

Instructions: Attempt any 5 (five) Questions

Questions no.		Questions	marks
5	a	Explain briefly different types of data structures with example.	5
	b	Explain what is time complexity and space complexity of an algorithm?	2+2=4
6	a	What is a string? Write a function for concatenating two strings STR1 and STR2 to get new strings STR3.	2 + 4=6
	b	What do you mean by multi dimensional array? Explain with example.	3

7	a	What do you mean by Linked List ? Write a function to insert a node at a the beginning of a linked list.	2+4=6
	b	Write some differences between linked list and array.	3
8	a	What is a Stack ? Write function for POP operation of Stack .	5
	b	Define a Circular Queue and Priority queue.	2+2= 4
9	a	What is a binary tree? Write some properties of binary tree.	2+2=4
	b	What are the different ways of traversing a binary tree? Write a function for traversing a binary tree in any order.	5
10	a	Write an algorithm and function for Binary Search.	5
	b	Write a function to implement insertion sort.	4
11	a	Define weighted graph and adjacency matrix.	4
	b	What do you mean by Traversal of graphs ? Write briefly about Depth First Search technique.	5
12		Write short notes on any 3 (Three) i) Garbage Collection ii) Bubble sort iii) Binary Search Tree iv) Merging sort v)Adjacency Matrix	3 X 3 = 9