Code No. : 14146 AS (B)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade

B.E. IV-Semester Advanced Supplementary Examinations, September-2022.
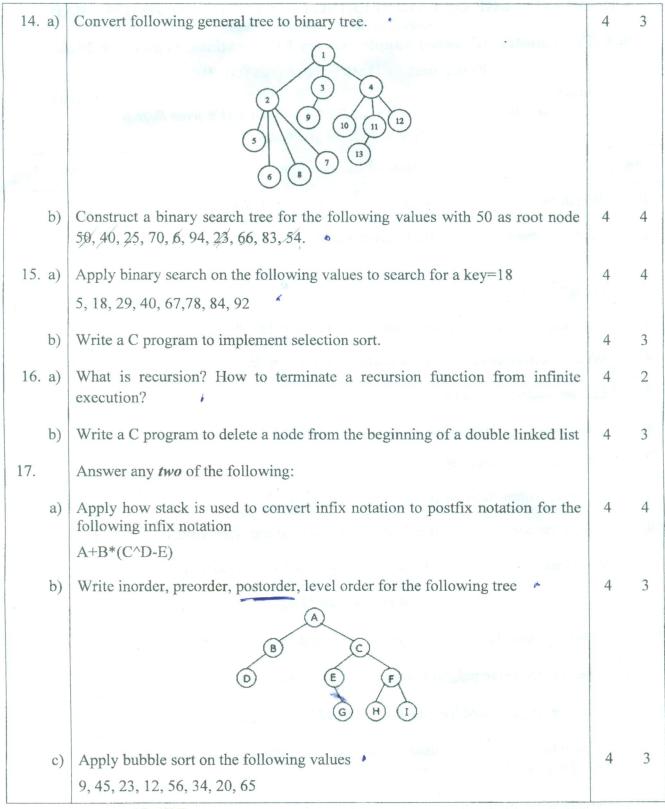
Principles of Data Structures (OE-II)

Time: **3 hours**

Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any FIVE from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L
1.	Which factors are used to identify an efficiency of an algorithm?	2	1

2.	Find out time complexity for following code
	for(i=1;i<=n;i++)
	print("It is DS");
		2	2

3.	How single linked list differs from circular linked list?	2	1
4.	Write structure code to create a double linked list node.	2	2
5.	List applications of stack.	2	1
6.	Write postfix and prefix notation of (a+b)*(c/d)	2	2
7.	What are properties of binary tree?	2	2
8.	Write algorithm steps for tree postorder traversal.	2	1
9.	Write time complexity of linear search in best case and worst case.	2	1
10.	Which sorting techniques follows divide and conquer approach?	2	2

Part-B (5 × 8 = 40 Marks)

11. a)	Compare linear data structures and non-linear data structures.	4	2
b)	Write a C recursive program to print N^{th} Fibonacci number.	4	3
12. a)	Compare single linked list and double linked list.	4	2
b)	Explain how a tail node is used to decrease time complexity to insert a node at end of the circular linked list.	4	3
13. a)	Explain what are the operations can be performed on stack with an example.	4	2
b)	Find the result of following postfix expression using stack 4572+-*	4	4

			M	L
14.	a)	Convert following general tree to binary tree.	4	3
	b)	Construct a binary search tree for the following values with 50 as root node 50, 40, 25, 70, 6, 94, 23, 66, 83, 54.	4	4
15.	a)	Apply binary search on the following values to search for a key=18 5, 18, 29, 40, 67, 78, 84, 92	4	4
	b)	Write a C program to implement selection sort.	4	3
16.	a)	What is recursion? How to terminate a recursion function from infinite execution?	4	2
	b)	Write a C program to delete a node from the beginning of a double linked list	4	3
17.		Answer any *two* of the following:		
	a)	Apply how stack is used to convert infix notation to postfix notation for the following infix notation A+B*(C^D-E)	4	4
	b)	Write inorder, preorder, postorder, level order for the following tree	4	3
	c)	Apply bubble sort on the following values 9, 45, 23, 12, 56, 34, 20, 65	4	3

M : Marks;   L: Bloom's Taxonomy Level;   CO; Course Outcome;   PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	12.5%
ii)	Blooms Taxonomy Level – 2	32.5%
iii)	Blooms Taxonomy Level – 3 & 4	55%

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