

University of Mumbai
Examination First Half 2022
Examinations Summer 2022

Program: **Electronics Engineering**

Curriculum Scheme: Rev2019

Examination: TE/V

Course Code: ELDO501 and Course Name: Data Structures

Time: 2 hour 30 minutes

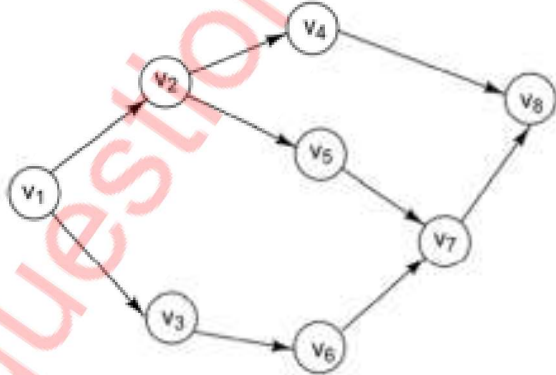
Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which of the following hash function uses remainder operator for generation of hash key?
Option A:	Mid square
Option B:	Modulo N
Option C:	Folding
Option D:	Digit Analysis
2.	For list with n elements, Bubble sort involves _____ passes and _____ comparisons in every pass.
Option A:	n-1 , n-1
Option B:	n , n
Option C:	n-2 , n-2
Option D:	n-1 , 1
3.	In 1D array representation of binary tree, if the index of a node is 'r' then the index of its left child is given by _____
Option A:	r + 1
Option B:	2r + 1
Option C:	2r + 2
Option D:	r / 2
4.	In non- empty Singly Linked List if a node pointer cur is initialized with address of first node , then the loop while(cur->next != NULL) will terminate when cur pointer starts pointing to _____
Option A:	NULL
Option B:	Last node
Option C:	Second last node
Option D:	First Node
5.	In Preorder traversal of binary tree , the sequence is _____
Option A:	Node Left Subtree Right Subtree
Option B:	Left Subtree Right Subtree Node
Option C:	Left Subtree Node Right Subtree
Option D:	Node Right Subtree Left Subtree
6.	Let the following circular queue can accommodate maximum six elements with the following data :

	front = 2 rear = 4 queue = _____; L, M, N, ____, ____ What will happen after INSERT O operation takes place?
Option A:	front = 2 rear = 5 queue = _____; L, M, N, O,
Option B:	front = 3 rear = 5 queue = L, M, N, O,
Option C:	front = 3 rear = 4 queue = _____; L, M, N, O,
Option D:	front = 2 rear = 4 queue = L, M, N, O,
7.	To convert an expression from infix to postfix form using STACK, If an operator is encountered , then the action will be
Option A:	Put it in postfix expression
Option B:	Ignore it.
Option C:	Push it on stack
Option D:	Push it only if its precedence is ABOVE the residing operator else perform pop till the condition becomes TRUE.
8.	DFS graph traversal uses _____ whereas BFS graph traversal uses _____.
Option A:	Linked List , Stack
Option B:	Queue , Stack
Option C:	Stack , Queue
Option D:	Stack , Stack
9.	Circular queue is used to avoid _____ which happens in linear queue.
Option A:	Queue Full Problem
Option B:	Memory wastage
Option C:	Empty Queue problem
Option D:	Single direction traversal
10.	_____ is an open-addressing scheme where we look for i^2 slot in i 'th iteration, if the given hash value x collides in the hash table.
Option A:	Linear Probing
Option B:	Double Hashing
Option C:	Quadratic Probing
Option D:	Chaining

Q2	Solve any Two out of Three (10 marks each)
A	Explain binary tree representation techniques with suitable examples.
B	Write an algorithm for Singly Linked list to perform the following operations: i. Create SLL ii. Display SLL iii. Delete a node from SLL
C	Design(Construct) a Binary Search Tree for the following list of elements: 30, 20, 40, 50, 10, 75, 85, 5, 15, 25, 45

Q3	Solve any Two out of Three (10 marks each)
A	Explain the Preorder, Inorder and Postorder Traversal with suitable examples.
B	Design a Huffman Tree for the word “STRUCTURE”.
C	Explain any two applications of stack with examples.

Q4	Solve any Four out of Six (5 marks each)
A	Explain various Linear & Nonlinear Data Structures with their Real World Applications.
B	Explain the concept of Arrays. Compare Static Arrays with Dynamic Arrays
C	Write an algorithm for the BFS (Breadth First Search) graph traversal method. Apply BFS on the following Graph 
D	Define Graph. What is an adjacency matrix? Derive adjacency matrix for the following directed Graph.

E	How is binary search different from linear search? Write the algorithm for binary search.
F	What is a collision in hashing? Explain any two collision resolution techniques in hashing.

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