Shah & Anchor Kutchhi Engineering College
Program: Electronics & Computer Science
Curriculum Scheme: Rev2019
Examination: SE Semester III
Sample Paper
Course Code:ECC304 and Course Name: Data Structures & Algorithms
Time: 2 hour 30 minutes **Max. Marks: 80**

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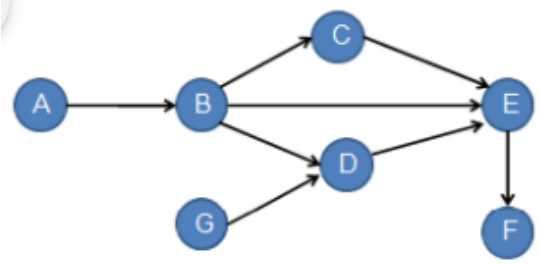
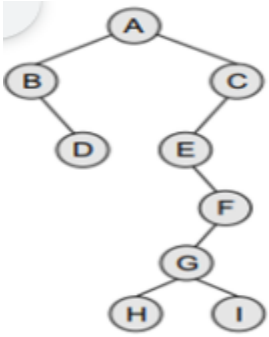
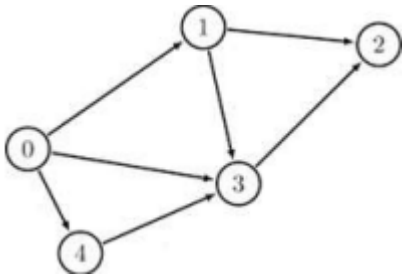
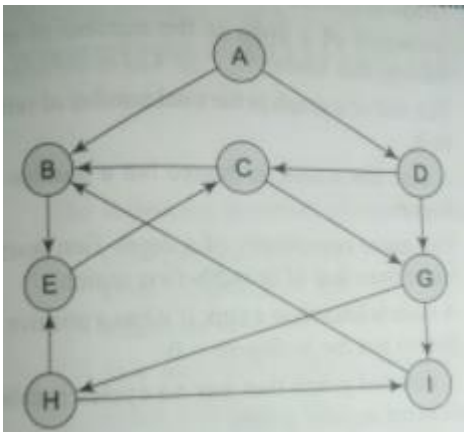
All Questions are compulsory. Each Question carry 2 Marks
1. Disked piled up one above the other represent a _____.
A. Stack
B. Queue
C. Linked List
D. Array
2. In Queue data structure ,the position in queue where insertion of data element is occur is known as _____end and another end at which deletion is occurs is known as _____ end.
A. Rear, Front
B. Front, Rear
C. Top ,Rear
D. Front,Top
3. Converting infix expression (A-B)*(C +D) into prefix expression is
A. AB-CD*
B. *-AB+CD
C. ABCD*-
D. *-ABCD
4. Hash function f defined as f(key)=key mod 11, with linear probing, is used to insert the keys 37,38,72,48,98,56 into a table index starting from 0. What will be the location of key 16?
A. 5
B. 6
C. 7
D. 8
5. Assume a binary search tree created by inserting the values 45,39,56,12,34,78,32,10,89,54,67,81 Number of nodes in the right subtree will be
A. 4

B. 5
C. 6
D. 7
6. The in-degree and out-degree of node D in directed graph is _____. 
A. 2,0
B. 2,1
C. 1,2
D. 0,2
7. Find the sequence of nodes that will be visited using post -order traversal 
A. A, B, D, C, E, F, G, I, and H
B. D,B,H,C,E,F,G,I and A
C. D,B,H,I,G,F,E,C, and A
D. A, B, D, C, E, F, G, H, and I
8. The Execution Time of bubble sort is _____.
A. o(n)
B. o(k)
C. o(n^2)
D. o(n/k)
9. Performance of the linear search algorithm can be improved by using a_____.
A. Stack
B. Queue
C. Linked List
D. Sorted Array

10. Which algorithm uses the divide ,conquer, and combine algorithm paradigm.
A. Selection Sort
B. Merge Sort
C. Bubble Sort
D. Heap Sort

Q2 (20 Marks)	**Attempt any Four Questions. Each question carries 5 Marks.**
A	Illustrate topological sorting for the following graph: 
B	An array contains the elements – 8,13,17,26,44,56,88,97. Using binary search algorithm, trace the steps followed to find numbers 56 & 9. At each step, show the contents of low, high & mid and array after each iteration
C	Explain deletion of a node in a binary search tree.
D	Define ADT. Write ADT for stack.
E	Explain the terms infix expression ,prefix expression and postfix expression.
F	Write a program to implement stack that stored name of student in the class.
Q3 (20 Marks)	**Attempt any two Questions. Each question carries 10 Marks.**
A	Create a Huffman tree and find Huffman codes for each character in the string “CONNECTION”.
B	Write a C program for Singly Linked list for performing following operations i. Create SLL ii. Display SLL iii. Delete last node from SLL iv. Insert a node at start of SLL

C	Explain breadth first and depth first traversal scheme in detail. and find out DFS and BFS for the below graph. 
Q4 (20 Marks)	**Attempt any Two Questions. Each question carries 10 Marks.**
A	Define recursion. Differentiate between iteration and recursion. Write a C program to check whether a string is palindrome or not, with the help of stack data structure.
B	Explain Bubble sort and Insertion Sort in Detail.
C	Write a program to create a binary search . and differentiate between binary tree and binary search tree.