COER University

END SEMESTER EXAMINATION, EVEN SEM 2022-23

Time : 3 hours
Program Name : BCA
Course Name : Data Structures using C

Total Marks : 100
Semester : II
Course Code : BCA201/SOC152

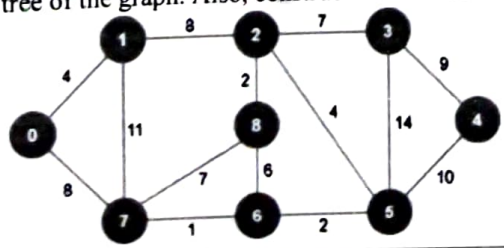
Note: All questions are compulsory. No student is allowed to leave the examination hall before the completion of the time.

Q. No 1	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	What is a data structure? Why do we need data structures?	CO 1	1
(b)	Describe abstract data type (ADT) with example. Mention the features of ADT.	CO 1	1
(c)	What do you mean by Asymptotic Notations for complexity of algorithm? List the commonly used asymptotic notations and explain any one.	CO 1	2
(d)	What do you mean by Algorithm Analysis? List the type of Algorithm Analysis and explain any one.	CO 1	1
(e)	Compare linear and non-linear data structure. Give examples of each. What are common operations that can be performed on a data-structure?	CO 1	4

Q. No 2	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	Describe array? How to declare and initialize one dimensional array?	CO 2	2
(b)	Differentiate Array and Link list in context of memory representation.	CO 2	4
(c)	Define Stack. What are the applications of the stack?	CO 2	1
(d)	Write down the prefix and postfix forms of each of the following infix expressions: A*B-(C+D)-(E-F)+G/H.	CO 2	3
(e)	Illustrate an algorithm to push and pop an element in a stack.	CO 2	4

Q. No 3	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	Define queue. What are the operations of a queue?	CO 3	1
(b)	Construct a C program to remove duplicates from a single unsorted linked list.	CO 3	3
(c)	What are the types of linked lists? How the singly linked listscan be represented?	CO 3	1
(d)	Evaluate how the singly linked lists can be traverse represented. Explain with the help of C code.	CO 3	5
(e)	Write an algorithm to insert an element in a circular queue.	CO 3	3

Q. No 4	Attempt Any Two Parts. Each Question Carries 10 Marks.	CO	BL
(a)	(i) Differentiate the linear search and binary search techniques to search an element in Array. (ii) Explain the linear search technique with a suitable example.	CO 4	2
(b)	What is a Binary Search Tree (BST)? What are the different ways of representing a Binary Tree? Apply BST for the following sequence of numbers. 47, 55, 23, 17, 39, 11, 50, 9, 19, 74, 33, 28	CO 4	3
(c)	Explain selection sort algorithm with suitable example.	CO 4	3

Q. No 5	Attempt Any Two Parts. Each Question Carries 10 Marks.	CO	BL
(a)	Explain Prim's algorithm with an example?	CO 5	3
(b)	Given an undirected weighted graph, write Kruskal's algorithm to find the minimum spanning tree of the graph. Also, construct the minimum spanning tree for the given graph: 	CO 5	3
(c)	Illustrate the steps of Depth-first search technique of graph withsuitable example.	CO 5	4

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