Paper / Subject Code: 50923 / Data Structure

SE Sem III (R-2019 C Scheme) "Computer" May'2023

30/5/2023

(3 Hours) **Total Marks: 80**

N.B: (1) Question No. 1 is compulsory
(2) Attempt any three questions out of the remaining five questions

Q.1 (a) Explain various types of data structures with example. **5**

(b) Define Graph and explainvarious graph representationtechniques. **5**

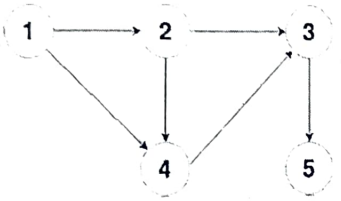
l Convert the following expression to postfix. **5**
(f-g) * ((a+b) * (c-d))/e

(d) Differentiate between B tree and B+ tree. **5**

Q.2 (a) Apply linear probing and quadratic probing hash functions to insert values in the Hash table of size 10. Show number of collisions occurs in each technique. **10**
27, 72, 63, 42, 36, 18, 29,101

(b) Construct B+ tree of order 3 for the following dataset **10**
90, 27, 7, 9, 18, 21, 3, 4, 16, 11, 1, 72

Q.3 (a) Write BFS algorithm. Show BFS traversal for the following graph with all the steps. **10**



(b) Write a C program to implement linear queue using array. **10**

Q.4 (a) Write a program to perform the following operations on the Singly linked list: **10**
i. Insert a node at the end
ii. Delete a node from the beginning
iii. Search for a given element in the list
iv. Display the list

(b) Write a C program to implement Stack using Linked List **10**

Q.5 (a) Write a program to evaluate postfix expression using stack data structure **10**

(b) Construct AVL for following elements **10**
50, 25, 10, 5, 7, 3, 30, 20, 8, 15

Q.6 (a) Construct Binary Tree from following traversal. **10**
In–order Traversal: D B H E I A F J C G
Post order Traversal: D H I E B J F G C A

(b) Write a C program for polynomial addition using a Linked-list. **10**
