POKHARA UNIVERSITY

Level: Bachelor | Semester: Fall | Year : 2024
Programme: BE | Full Marks : 100
Course: Data Structure and Algorithm | Pass Marks : 45
Time : 3 hrs.

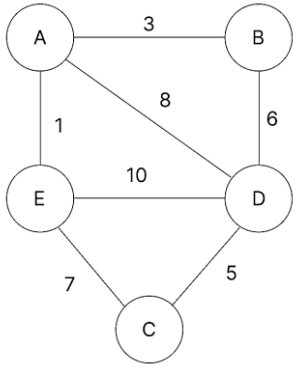
Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1.	a)	What is abstract data type (ADT)? Explain the role of data structure in computer science.	7
	b)	Evaluate the expression ABCD-*+ using stack with A = 5, B = 4, C = 3 and D = 7.	8
2.	a)	Implement enqueue and dequeue operations in circular queue using C/C++ language.	8
	b)	Define a linked list. Write an algorithm to insert a node at the end.	7
3.	a)	Write an algorithm to insert a node at the beginning of the doubly circular linked list.	7
	b)	Explain the base case and recursive case in the recursive algorithm for solving the Tower of Bhramha.	8
4.	a)	Define a complete binary tree. Why do you need to balance a binary search tree? Explain with example.	7
	b)	Construct an AVL tree from following sequence of numbers inserted in an order: 30,11,5,22,17,18,50,45	8
5.	a)	Define internal sorting. Sort the data 40,30,12,21,4,5,78,6,5 using Insertion Sort.	7
	b)	What is Hashing? With given input {4371, 1323, 1222, 3424, 6173, 4199, 4344, 9679, 1989} and hash function: h(x) = x mod 10, show the following. i. Hash table using linear probing ii. Hash table using quadratic probing	8

6. a) Define directed graph. Find minimum spanning tree of following graph using Kruskal's Algorithm. 7



b) When do we use Breadth First Search and Depth First Search in graph problem? Explain any one with example. 8

7. Write short notes on: (**Any two**) 2×5

a) Push and POP operations

b) Divide and Conquer algorithm

c) B Tree