Data Structures and Analysis **Q. P. Code: 24476**

(Time: 3 Hours) **[Total Marks: 80]**

N.B.: (1) Question No.1 is compulsory.

(2) Attempt **any three** out of remaining questions.

(3) Assume Suitable data if necessary.

(4) **Figures** to the **right** indicate full **marks**.

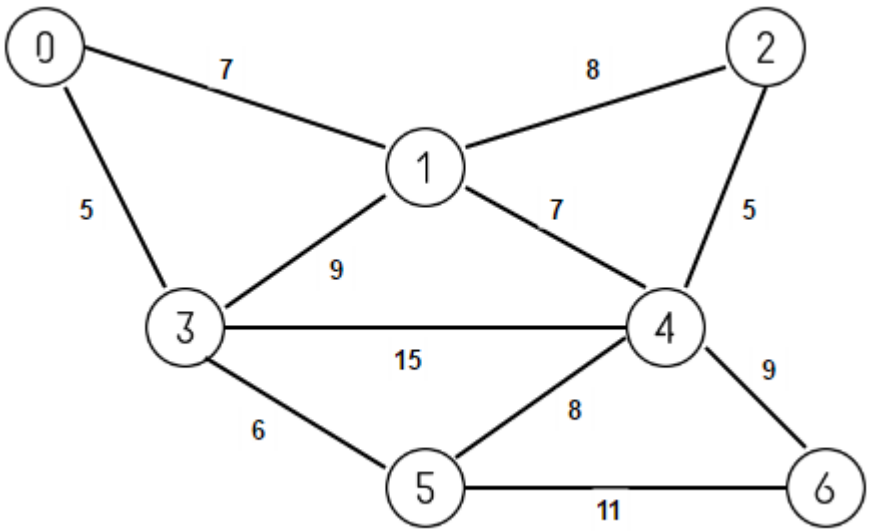
1.	(a)	What are the applications of Stack?	3
	(b)	What are the advantages of circular linked list?	3
	(c)	Differentiate between space complexity and time complexity.	3
	(d)	Explain linear and non linear data structures.	2
	(e)	What is expression tree? Give Example.	3
	(f)	Explain asymptotic notations.	3
	(g)	What is recursion? State its advantages and disadvantages.	3
2.	(a)	Write an algorithm for converting infix to postfix expression.	10
	(b)	Explain BFS and DFS algorithm with examples.	10
3.	(a)	Write an algorithm for following operations on singly linked List (1)Insertion (2)Deletion (3)Traversal	10
	(b)	Write an algorithm for implementing stack using array.	10
4.	(a)	Explain the properties of Binary search tree. Construct Binary search tree for following elements: **47,12,75,88,90,73,57,1,85,50,62**	10
	(b)	Explain Quick sort using an example. Write algorithm for it and comment on its complexity.	10

5. (a) What is collision? What are the methods to resolve collision? Explain Linear probing with an example. 10

   (b) Write an algorithm for merge sort and comment on its complexity. 10

6. (a) Write an algorithm for implementing Queue using array. 10

   (b) What is Minimum Spanning Tree? Draw the MST using kruskal's and prim's algorithm and find out the cost with all intermediate steps. 10



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