S.E. (Computer) 2008 Course
Data Structure and Problem Solving

**Time: 2 Hours**   **Max. Marks : 50**

Instructions to the candidates:
  1) *Answers Q.1 or Q.2,Q.3 or Q.4,Q.5 or Q.6,Q.7 or Q.8.*
  2) *Neat diagrams must be drawn wherever necessary.*
  3) *Figures to the right side indicate full marks.*
  4) *Assume Suitable data if necessary*

SECTION I

Q1)	a)	Find the frequency count for the following code.
		for(i=1;i<=n;i++)
		{
		for(i=1;i<=n;i++)
		{
		for(i=1;i<=n;i++)
		{
		sum=sum+I;
		}
		}
		}
			[3]

	b)	Write a function for selection sort using templates.	[3]
	c)	What is ADT? Write an ADT for Deques.	[6]
		OR	
Q2)	a)	Explain different Asymptotic notations.	[3]
	b)	**Convert the following tree into Binary tree** 	[6]
	c)	Consider the following tree given in the problem. Show a Postorder, Preorder and In order Traversal of the tree	[3]
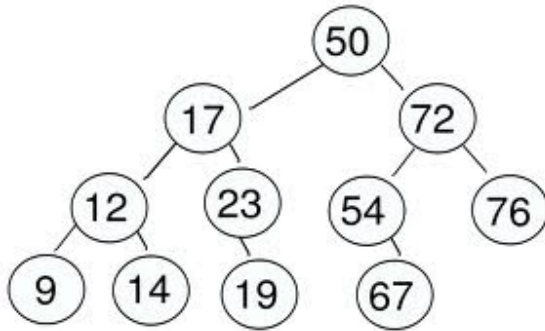
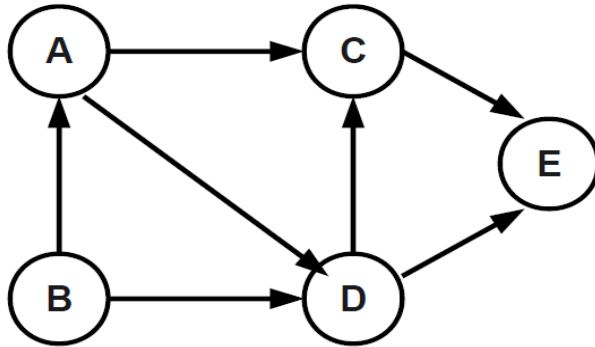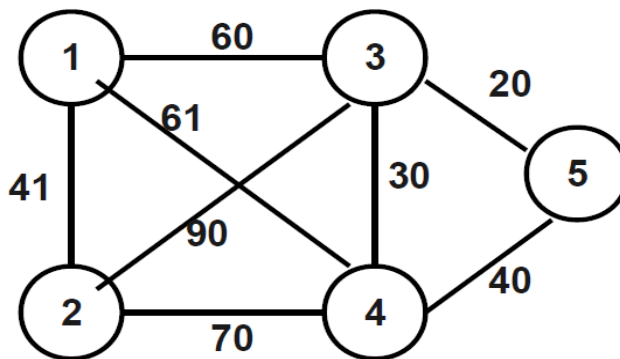|			
Q3)	a)	Sort the digraph for topological sort refer figure 1 below FIGURE 1	[3]
	b)	Convert given graph into MST refer figure 2 below. FIGURE 2	[3]
	c)	What is collision? What Are different collision resolution techniques?	[3]
	d)	Draw a binary search tree for the following data 10, 08, 15, 12, 13, 07, 09, 17, 20, 18, 04, 05	[3]
		OR	
Q4)	a)	Explain with suitable example the various storage structures for the graph	[6]
	b)	Construct the AVL tree for the following data by inserting each data item one at a time. 15, 20, 24, 10, 13, 7, 30, 36, 25	[6]
Q5)	a)	Sort the following data in ascending order using heap sort.15, 19, 10, 7, 17, 16	[6]
	b)	Write an algorithm to search an element in a B Tree	[4]
	c)	Define sequential file organization and state its advantages and disadvantages	[3]
		OR	
Q6)	a)	What is ISMA in file organization? Explain Advantages & Disadvantages of	[6]

		sequential file organization.	
	b)	What is a B+ tree? Give structure of its internal node. What are the order of B+ tree & Characteristics of B+ tree.	[7]
Q7)	a)	Explain in detail the models used for parallel computation	[6]
	b)	Write a parallel algorithm to perform the addition of the given numbers using complete binary tree method	[7]
		OR	
Q8)	a)	Write a parallel algorithm for pointer doubling. Explain with suitable example	[7]
	b)	Write a parallel algorithm for odd-even merge sort.	[6]