

Mid-West University  
**Examinations Management Office**

Semester End Examinations 2081

Bachelor level/ B.E. Computer/ 5<sup>th</sup> Semester

Time: 3 hours

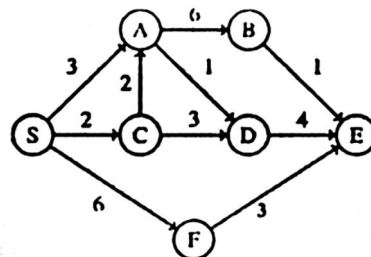
**Subject: Data Structure and Algorithm (CO452/CO512)**

Full Marks: 50

Pass Marks: 25

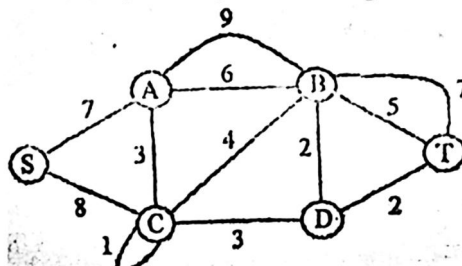
- Attempt all the questions
- Figures in the margin indicate full marks.
- Assume suitable values, with a stipulation, if necessary.
- Candidates are required to answer the questions in their own words as far as possible.

1. How can you describe ADT and algorithm? Write down the difference between linear and non-linear data structure. [2+3]
2. Describe linear queue with an example. Convert the expression  $A+B-C*D+E-(F/G)$  into prefix and evaluate  $A=1, B=4, C=2, D=8, E=3, F=9, G=3$ . [2+3]
3. Differentiate between a static and dynamic list structure. Write algorithm for different operations in array implementation of list. [2+3]
4. How do you delete a node at beginning of double link list? Write algorithm of linked stack for PUSH and POP operations. [2+3]
5. What is recursion? Write a program to find the  $N^{\text{th}}$  Fibonacci number using recursion. [1+4]
6. Write an algorithm to insert data in Red-Black tree. Construct a binary tree from its give pre-order and post-order traversal  
Pre-order: ABDGHKCEF  
Post-order: GKHDBEFCA [2+3]
7. Discuss the relevancy of Huffman algorithm in trees. Construct AVL tree using data sets 14,12,20,18,23,4,44,64,66. [2+3]
8. Write algorithm of Radix sort. Sort the numbers 40, 90,20, 10, 30, 5,50, 100, 80 using max heap sort method. [2+3]
9. Define hashing and hash collision. Consider a hash table of size 10, using linear probing insert the key 62,37,36,44,67,91,82 and 107. [1+4]
10. Explain Breadth first traversal search techniques. Find the shortest paths for given directed graph with source node 'S' to E using Dijkstra's directed graph algorithm. [2+3]



OR

Write the importance of growth function in algorithm. Describe theta. Find the minimum spanning tree for the following graph using Kruskal algorithm.



The End