Mid-West University

Examinations Management Office

Semester End Examinations 2081

Bachelor level/ B.E. Computer/ 5th Semester — Full Marks: 50

Time: 3 hours — Pass Marks: 25

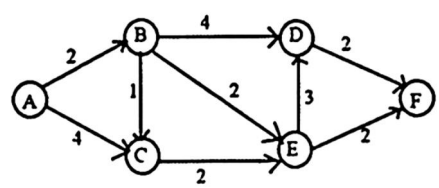
Subject: Data Structure and Algorithm (CO512/CO452)

- *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. Define data structure with importance. Differentiate between primitive and non-primitive data structure. **[5]**
2. Write an algorithm for Top of Stack Fixed method. Evacuate the infix expression (A+B-C)*D+E-(F/G) where value of A=1,B=4, C= 2, D=8, E= 3, F=9, G=3 using stack data structure. **[5]**
3. Explain static data structure. Write algorithms to create, insertion and deletion of data in array implementation of list. **[5]**
4. Explain dynamic implementation. Write algorithms to insert a new node after and before a given node of linked list? **[5]**
5. Write the applications of recursion. Write an algorithm for TOH with 'n' disks and generate a recursion tree of Fibonacci series fib (6). **[5]**
6. Write an algorithm to insert data in Red-Black tree, Construct a binary tree from its give pre-order and post-order traversal **[5]**

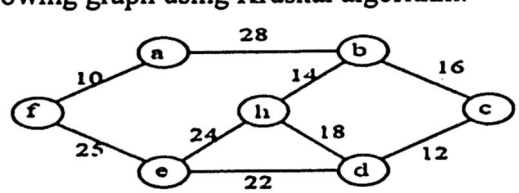
   Pre order: FBADCEGIH

   Post order: ACEDBHIGF
7. Write an algorithm for deletion of a node in BST. Encode the following symbols A, B, C, D, E and F with frequencies 0.17,0.11,0.24,0.33 and 0.15 respectively by using Huffman algorithm. Also calculate average number of bit used encode a symbol. **[5]**
8. Write algorithm of Radix sort. Sort the numbers 40, 90,20, 10, 30, 5,50, 100, 80 using max heap sort method. **[5]**
9. Define Collision. Insert following keys: 30, 25,79, 19, 48, 28,21 and 44 in hash table using linear probing method where h(key) = key%10. **[5]**
10. Describe Warshall's algorithm. Find the shortest paths for given directed graph with source node 'A' using Dijkstra's directed graph algorithm to F. **[5]**



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