BACHELOR IN COMPUTER APPLICATIONS

Term-End Examination

June, 2007

CS-62 Ⓢ : 'C' PROGRAMMING AND DATA STRUCTURE

Time : 2 hours *Maximum Marks : 60*

Note : *Question no. 1 is **compulsory**. Answer any **three** questions from the rest. All algorithms should be written nearer to 'C' language.*

1. (a) Write an algorithm to subtract two polynomials using array implementation. Assume polynomials have M and N terms. *8*

(b) What is garbage collection ? Explain Fragmentation, Compaction and Relocation w.r.t. garbage collection. *6*

(c) Write an algorithm to store the sparse array using linked list. *6*

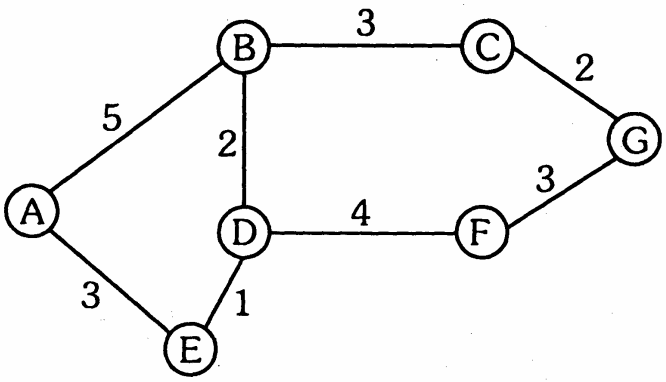
(d) Write the functions in C language for insertion and deletion of a node in a Heap. *8*

(e) Find the number of nodes in a balanced binary tree of height "h". *2*

2. (a) A two dimensional matrix is represented using a row major order. Write the formula and calculate the address of element A[10] [5]. Assume the dimensions as A[10] [10]. *3*

(b) Write an algorithm for converting an Adjacency list to an adjacency matrix in 'C' language. *7*

3. (a) Consider the graph :



Construct a minimum cost spanning tree using Prim's algorithm and calculate the cost of this tree. *7*

(b) How are command line arguments passed on to 'C' programs ? Write a program to count the number of command line arguments. *3*

4. (a) The following input sequence is sorted in increasing order using quicksort algorithm :

75, 72, 64, 81, 56, 92, 62

Show the sorting process step-wise. *5*

(b) Write a non-recursive program in 'C' to traverse a binary tree in preorder. *5*

5. Explain the following with an example each : *10*

(a) Union in 'C'

(b) AVL Tree

(c) Hash function

(d) Weakly connected graph

(e) Indexing w.r.t. files