SUBJECT CODE NO: E-269
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CSE/IT) (CGPA) Examination Nov/Dec 2017
Data Structures
(REVISED)

[Time: Three Hours]   **[Max.Marks:80]**

Please check whether you have got the right question paper.
N.B   i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
               ii) Solve any two questions from the remaining questions in each section

Section A

Q.1   Solve any five   10

a)   What does 'sizeof ' operator do in c?

b)   What are the various operations that can be performed on different data structures?

c)   What will be output of the following code segment?
int a[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
$*p = a$;
printf (" %d : %d" , P[7], P[a[7]]);

d)   Convert given expression in prefix and postfix form $A * B + C * D + E$

e)   Explain queue full & queue empty condition.

f)   Give circular linked representation of
Polynomial: $10x^4 + x^2 + x + 5$

g)   How array is different from linked list.

Q.2 (a) Write c program to find second largest and smallest element in an Array.   07

(b) What is pointer? Explain various functions used in C for dynamic memory allocation.   08

Q.3 (a) Write C program to implement stack using dynamic memory allocation.   07

(b) What is circular queue? A circular queue has a size of 5 and has three elements 10,40 and 20,   08
where F =2 and R = 4. Trying to insert 30 at this stage what will happen? Delete 2 elements from
queue and insert 100, show sequence of steps with necessary diagram with value of front (F) and
rear (R).

2017

Q.4 (a) Explain how to implement stack using linked list. 07

(b) Write C function to perform following operations on linear linked list: 08
   i)   Insert a node at end of list

   ii)   Delete a node from a list

Q.5 (a) Evaluate given postfix expression using stack: A=1, B=2, C=3, ABC + * CBA - + * 08

(b) Write two applications of each 07
   - Stack
   - Queue
   - Linked List

Section B

Q.6   Solve <u>any five</u> 10

(a) Explain following tree terminologies
   (i)   Degree of node
   (ii)   Leaf node

(b) Construct binary tree for a given sequence-
   Preorder : F, A, E, K, C, D, H, G, B
   Inorder : E, A, C, K, F, H, D, B, G

c) Represent following graph using Adjacency matrix
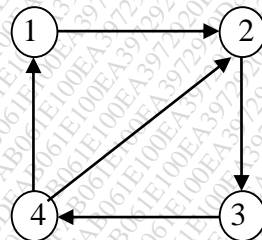
d) Name two traversal techniques of graph. Which data structures are used for their Implementation.

e) Search Key x = 25 using binary search method for following list
    10, 15, 25, 28, 35.

f) What is max heap property? Give example.

g) Differentiate between linear search and binary search.
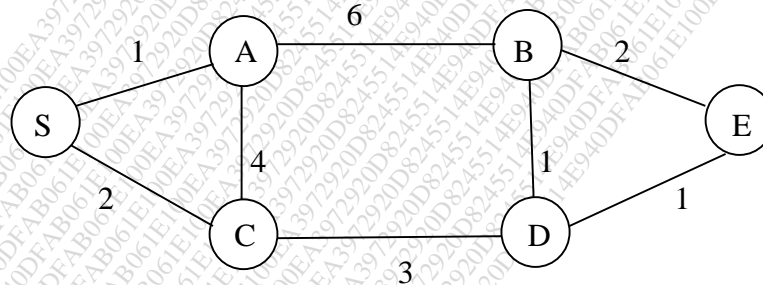
2017

Q.7 (a) What are the various Binary tree representation techniques? Apply these techniques on Following Binary tree   08
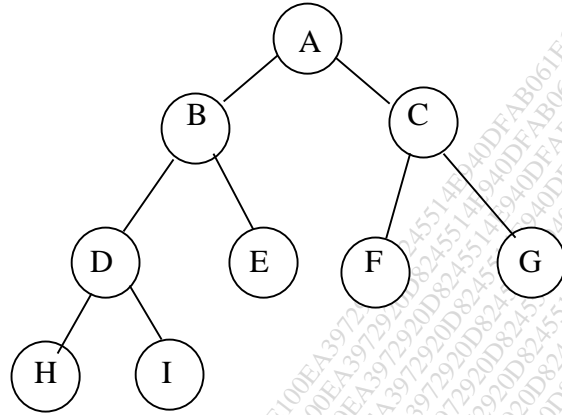
(b) Construct AVL tree for the list by successive insertion 5,6,8,3,2,4,7.   07

Q.8 (a) Write C program to implement breadth first search.   07

(b) Find Shortest path from S to E   08

Q.9 (a) Sort the given list using heap sort
9, 8, 6, 2, 4, 7, 5, 1   08

(b) Write C program for insertion sort.   07

Q.10 a) Sort the given list using selection sort in descending order : 26, 54, 93, 17, 77, 31   07

b) Define binary search tree, Explain insertion into BST and deletion from BST with example.   08

2017