VIT
U N I V E R S I T Y
(Estd. u/s 3 of UGC Act 1956)

School of Computing Sciences and Engineering
Model Question Paper
B.Tech [ECE,EEE,EIE] - II Semester
Subject:CSE102 – Data Structures and Algorithms

Time: Three Hours   **Max. Marks: 100**
PART – A (8 X 5 = 40 Marks)
Answer ALL Questions

1. Discuss briefly about the memory allocation functions in 'C'with suitable examples.

2. Explain how the pop operation stops working when the stack becomes empty. Explain how this operation is achieved.

3. Define pointers and what is the effect of ++ and – operators on pointers of different data types.

4. Synthesize the printer spooling application where the jobs given to the printer gets stored in queue before being sent to the printer. Illustrate the purpose of using queue for the application specified.

5. Consider the following algebraic expression E= (A +(B * C) – ((D * E + F) / G).

    a. Draw the Tree T which corresponds to the expression E.
    b. Find the prefix polish expression of E.

6. Explain with sample data how the concept of recursion helps in finding the GCD of two numbers

7. An array contains the elements shown below. What would be the value of the elements in the array at each pass of selection sort? 3   13   7   26   44   23   98   57

8. Perform DFS on the following graph (consider the adjacency matrix as A-C-B-D-F-E-G)
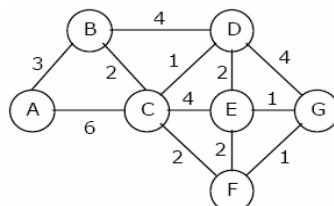
PART – B (6 X 10 = 60 Marks)
Answer any <u>SIX</u> Questions

9. a) Evaluate the following postfix expression: 6 2 3 + - 3 8 2 / + * 2 ↑ 3 +

    b) Write a note on allocation of storage and scope of variables in C.

10. Describe various operations of singly linked list with suitable routines and examples.

11. Define binary search tree. Construct the binary search Tree for the below given data.
   P, F, B, H, G, S, R, Y, T, W, Z
    What will be the new binary tree after performing the following operations?
    a) Insertion of Q   b) Insertion of A   c) Deletion of Z d)Deletion of H
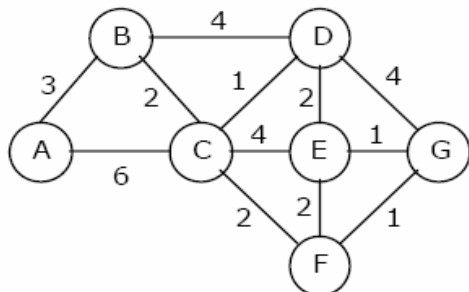
12. With suitable routines, sort the following data using quick sort. Trace all the intermediate steps involved.
   50   72   99   100   62   12   9   25   57

13. State the Dijkstra's algorithm for finding the shortest path. Find the shortest path between B to G for the below digraph:
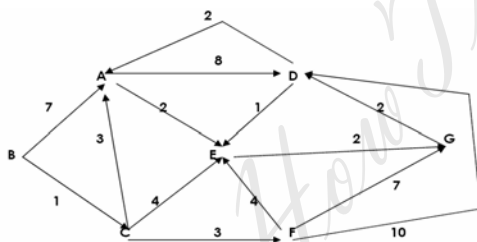
14. Trace all the steps in finding the minimum spanning for the below graph using kruskals algorithm

15. Write the procedure for in-order, pre-order, post-order traversals and perform the these traversals on following tree
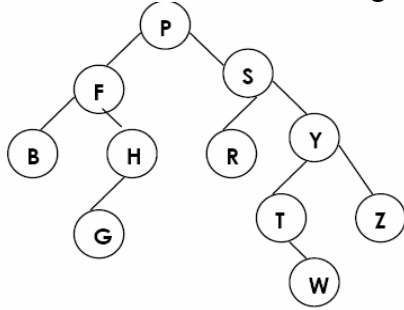
16. Describe the process of heap sort along with the steps followed to create a max-heap for the following given data

    34 44 78 22 7 98 56 2 38 35 45