Roll No .....

CS/IT-305 (GS)

B.E. III Semester Examination, June 2020

Grading System (GS)

CS-305: Data Structures

IT-305: Data Structure and Algorithm

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

l. Define the term array. How are two-dimensional arrays represented in memory? Explain how address of an element is calculated in a two-dimensional array.

2. Write an algorithm to implement depth-first search. How is depth-first search different from Breadth-first search? Also write any two application of complete graph.

3. Explain the following:
   i) Sparse matrices
   ii) Backtracking

4. Write short notes on:
   i) AVL Tree
   ii) Minimum Cost Spanning Tree
   iii) Sparse Matrix and its implementation

5. Define Huffman code? Explain using suitable example how Huffman codes are evaluated.

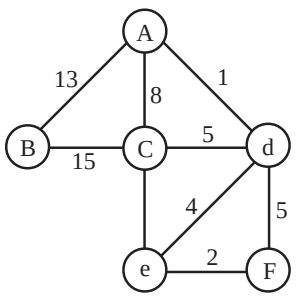
6. What are B-trees? Construct a B-Tree of order 3 for the following set of input data:
   69, 19, 43, 16, 25, 40, 132, 100, 145, 7, 15, 18.

   OR

   Write an algorithm for postfix to infix conversion. Consider the following arithmetic expression P, written in postfix notation:

   P : 12, 7, 3, -, /, 2, 1, 5, +, *, +. Translate P into infix expression using stack operations.

7. Find the minimum cost spanning tree for the following weighted graph.



OR

Define the term Recursion? Give a recursive algorithm to find n^{th} term of a Fibonacci series?

8. Answer any two of the following:
   a) Write an algorithms to find the largest of given *n* numbers. Derive its time complexity using asymptotic notations.
   b) What is Generalized linked list?
   c) Define internal and external sorting.
   d) Explain adjacency matrices graph representation.

******