North South University

Department of Electrical and Computer Engineering

Final Exam, Summer

Data Structure and Algorithm

CSE-225 (Sample Final Question)

Time: 1 hour 10 minutes (Including Uploads) **Full marks: 30**

Answer any 3 Question

1. a) Convert X: **(A*B + C)/D - E / (F + G)** into Postfix from showing stack status after every step in tabular form. 5

   b) The preorder traversal of a BST is 7,2,1,9,10,34,25. What is the 5th element in a Post traversal after deleting 7 (assuming that 7 is replaced by its inorder-successor)? 5

2 a) Construct a binary tree from the following traversing sequence of integers: 5

   Preorder: 50, 27, 16, 4, 12, 34, 29, 44, 88, 65,52,77, 93, 92

   Inorder: 4, 12, 16, 27, 29, 34, 44, 50, 52, 65, 77, 88, 92, 93

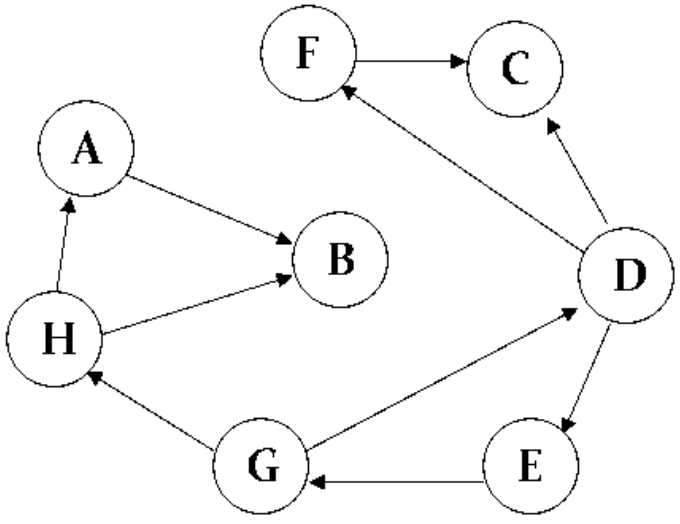
   b) The characters a to h have the set of frequencies based on the first 8 Fibonacci numbers as follows: 5

   a : 1, b : 1, c : 2, d : 3, e : 5, f : 8, g : 13, h : 21, i:34

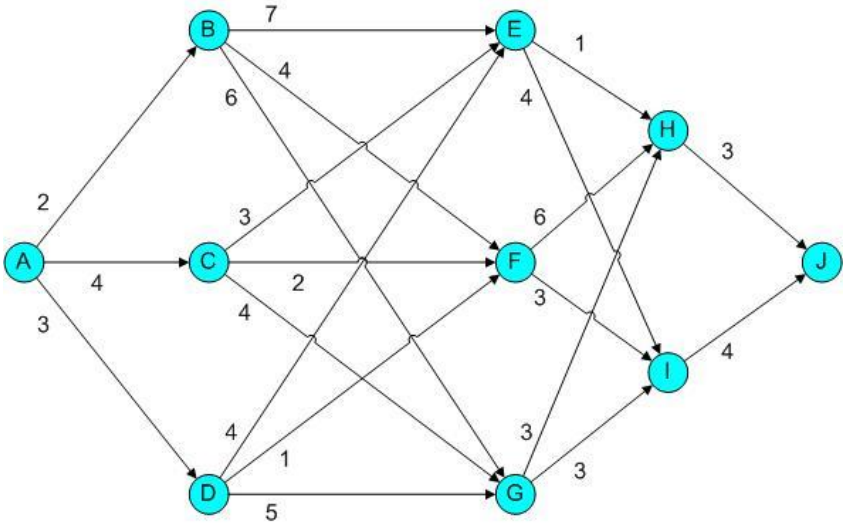
   A Huffman code is used to represent the characters. What is the sequence of characters corresponding to the following code?

   110111100111010

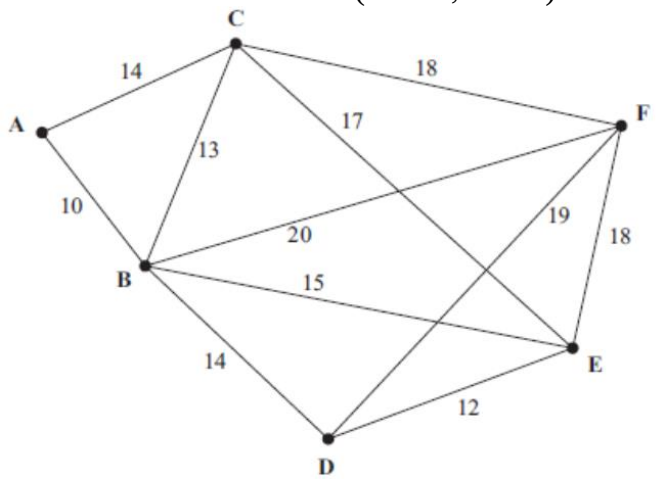
3. a) Conduct a Breath-first search in the graph and find all possible path from the node D. 5



3 b) Consider the following directed, weighted graph: What is the shortest-cost path from A to J in the graph? show the steps. 5



4. a) Use Prim's algorithm starting at node A to compute the Minimum Spanning Tree (MST) of the following graph. In particular, write down the edges of the MST in the order in which Prim's algorithm adds them to the MST. Use the format (node1 , node2) to denote an edge. 5



b) The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function h(k) = k mod 10 and linear probing. What is the resultant hash table? 5

0	
1	
2	
3	
4	
5	
6	
7	
8	
9	