Tribhuvan University
Institute of Science and Technology
2080

✡

Bachelor Level / First Year/ Second Semester/ Science Full Marks: 60
Computer Science and Information Technology **(CSC.154)** Pass Marks: 24
(Data Structure and Algorithm) Time: 3 hours.
(VERY OLD COURSE)

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Section A

Attempt any TWO questions. **[2×10=20]**

1. Define stack. How do you convert infix to postfix notation. Evaluate the postfix expression AB+C*DEFG-*+ using stack where A = 2, B = 3, C = 4, D = 5, E = 6, F = 7 and G = 8. [1 + 4 + 5]

2. Explain about linear queue and circular queue. Describethe insertion and deletion mechanism in priority queue. [4 + 6]

3. How do you delete the node at the end of doubly linked list? Describe about best case, worst case and average case of an algorithm. [5 + 5]

Section B

Attempt any EIGHT questions. **[8×5=40]**

4. Define Binary Search Tree. Create a BST from the dataset 45, 78, 3, 43, 90, 56, 90, 23, 45, 11, 9, 42. [1 + 4]

5. Given the alphabets {'a', 'b', 'c','d','e'} with frequency {10, 33, 8, 43, 6} respectively. Represent the Huffman code for each character. [5]

6. Sort the data 40, 90, 10, 31, 6, 60, 200, 80 using insertion sort. [5]

7. How do you choose pivot in Quick sort? Illustrate it in sorting 8, 7, 5, 6, 4. [1+4]

8. Consider a hash table of size 10. Using linear probing insert the keys 62, 37, 36, 44, 91, 72 and 207. [5]

9. Describe the advantages of binary search over sequential search with example. [5]

10. Define recursion. Write a recursive program to find the factorial value of any given positive integer. [1 + 4]

11. Distinguish between tree and graph. How do you represent graph using linked list. [1 + 4]

12. Define directed graph, undirected graph, spanning tree and minimum spanning tree. [5]

13. Write the advantages and disadvantages of contiguous list and linked list. [5]