

Tribhuvan University
Institute of Science and Technology
2077

Bachelor Level / third-semester / Science Full marks: 60 **Computer Science and Information Technology(CSC206)** Pass marks: 24
(Data Structures and Algorithms) Time: 3 hours Candidates are required to give their answers in their own words as far as practicable.
The figures in the margin indicate full marks.

Long questions:

Attempt any Two questions:(2 x 10 = 20)

1. What is stack? What are the different applications of stack? Explain stack operations with example.(1 + 3 + 7)
2. Differentiate between singly linked list and doubly linked list. How do you insert and delete a node from a doubly linked list? Explain.(3+7)
3. What is the shortest path? Explain Dijkstra algorithm for finding shortest path using suitable example.(2+8)

Short questions:

Attempt any Eight questions:(8 x 5 = 40)

4. What is dynamic memory allocation? Compare data structure with abstract data type.(2+3)
5. Explain algorithm for evaluation of postfix expression using stack.(5)
6. Explain queue as an ADT.(5)
7. Write a recursive program to find GCD of two numbers.(5)
8. What is a linked list? How is it different from array?(2+3)
9. Hand test bubble sort with array of numbers 53, 42, 78, 3, 5, 2, 15 in ascending order.(4+1)
10. What is hashing? Explain concept of hash table and hash function with example.(1 + 4)
11. What is the minimum spanning tree? Explain.(5)
12. Write short notes on: (2 x 2.5 = 5)
 - a. Tail recursion
 - b. Collision resolution techniques