

Tribhuwan University
Institute of Science and Technology
2077

Bachelor Level / Third Semester / Science

Computer Science and Information Technology(CSC206)

((TU CSIT) Data Structures and Algorithms)

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Full marks: 60

Pass marks: 24

Time: 3 hours

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 doubly linked list? Explain.(3+7)
3. What is 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 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 minimum spanning tree? Explain.(5)
12. Write short notes on: (2 x 2.5 = 5)
 - a. Tail recursion
 - b. Collision resolution techniques