CSc. 206-2075(NEW)✡

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Tribhuvan University
Institute of Science and Technology
2075
✡

Bachelor Level / Second Year/ Third Semester/ Science
Computer Science and Information Technology (CSc. 206)
(Data Structure and Algorithms)
(NEW COURSE)

Full Marks: 60
Pass Marks: 24
Time: 3 hours.

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

Long Questions:
Attempt any Two questions: (2×10=20)

1. How can you use stack to convert an infix expression to postfix? Convert infix expression (A+B)*(C–D) to postfix using sack. (4 + 6)
2. Explain concept of divide and conquer algorithm. Hand test quick sort algorithm with array of numbers (78, 34, 21, 43, 7, 18, 9, 56, 38, 19). What is time complexity of quick sort algorithm? (3 + 7)
3. Discuss depth first and breadth first traversal of a graph with suitable example. (5 + 5)

Short Questions:
Attempt any Eight questions: (8×5=40)

4. What do you mean by complexity of algorithms? How do you find time complexity? (2 + 3)
5. Compare stack with queue. How is linear queue different from circular queue? (2 + 3)
6. What is ADT? Discuss stack as an ADT. (1 + 4)
7. Define recursive algorithm? How do you implement recursive algorithms while writing computer programs? (2 + 3)
8. What are benefits of using linked list over array? How can you insert a node in a singly linked list? (2 + 3)
9. How do you implement binary search algorithm? What is time complexity of this algorithm? (4 + 1)
10. What is hashing? Discuss rehashing with example. (1.5 + 3.5)
11. How do you traverse a binary tree? Discuss. (5)
12. Write short notes on: (2 × 2.5 = 5)
    a. Dynamic memory allocation
    b. Game tree