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Question Paper Code: 53223

B.E. / B.Tech. DEGREE EXAMINATION, AUGUST 2021

Third Semester

Electronics and Communication Engineering

01UCS323 - DATA STRUCTURES AND ALGORITHM ANALYSIS

(Regulation 2013)

Duration: 1:45 hour

Maximum: 50 Marks

PART A - (10 x 2 = 20 Marks)

(Answer any ten of the following questions)

1. Define destructor.
2. List out the operators that cannot be overloaded.
3. What is the runtime polymorphism? How it is achieved?
4. What do you mean by stack unwinding?
5. Write the various applications of Stack.
6. Assume the hash function is $h(x) = (p + q) \% 5$ where $x = pq$ and key values are $x = \{35, 43, 59, 19\}$. Build the hash table with the size is 5.
7. Prove that the maximum number of nodes in a binary tree of height h is $2^h - 1$.
8. Define NP-Complete problem.
9. Write the steps involved in bucket sorting.
10. Distinguish between dynamic programming and divide and conquer.
11. What is internal sorting? List its types.

12. How is member function of a class defined?
13. Write syntax for class template.
14. What do you mean by stack unwinding?
15. Define Linked List. List the types of Linked List.

PART – B (3 x 10= 30 Marks)

(Answer any three of the following questions)

16. Design a matrix and vector classes with necessary properties. Write a C++ program to multiply vector and matrix class objects using Friend function. (10)
17. Explain exception handling mechanism with an example. (10)
18. Explain the various asymptotic notations used for calculating time and space complexities. (10)
19. Briefly explain single rotation and double rotation of AVL tree with examples. (10)
20. Write the procedure for quick sort. Show the stepwise result of sorting the following set of elements using quick sort: 23,12,45,21,67,81,19,22,56,41,33. (10)
