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Question Paper Code: 31046

B.E. / B.Tech. DEGREE EXAMINATION, OCTOBER 2014.

Third Semester

Electronics and Communication Engineering

01UCS323 - DATA STRUCTURES AND ALGORITHM ANALYSIS

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. How is member function of a class defined?
2. Define operator overloading.
3. State the use of pointer.
4. Write syntax for class template.
5. Define Linked List. List the types of Linked List.
6. Write brief note on properties of binary heap.
7. Point out the balance condition of AVL Tree.
8. Define Topological sort.
9. What is internal sorting? List its types.
10. Define Divide and Conquer technique. Give an example.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Analyze the various loop structures with examples. (10)
(ii) Elucidate static member functions. (6)

Or

- (b) (i) Define constructor. Explain copy constructor with example. (8)
(ii) Elaborate overloading binary operators with example program. (8)
12. (a) (i) Illustrate the types of inheritance with suitable examples. (12)
(ii) Describe about virtual functions. (4)

Or

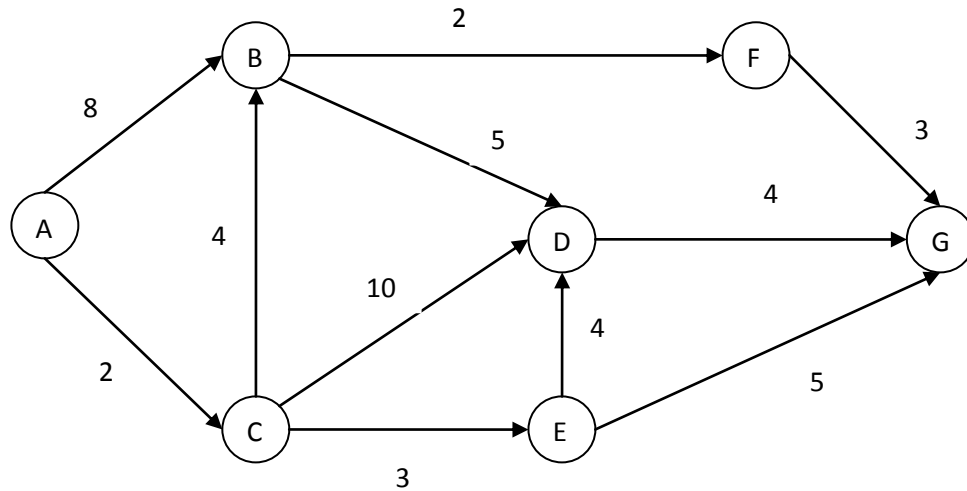
- (b) (i) What are the functions used to handle errors during file operations. (6)
(ii) Explain exception handling mechanism with an example. (10)
13. (a) (i) Write routines to insert and delete an element in single linked list. Explain with examples. (10)
(ii) Explain push and pop operation of stack using array. (6)

Or

- (b) Given input {5179, 2345, 5425, 6173, 4199, 4344, 8796, 2411} and a hash function $h(X) = X \text{ mod } 10$, show the resulting
- (i) Separate chaining hash table
 - (ii) Open addressing hash table using linear probing
 - (iii) Open addressing hash table using quadratic probing
 - (iv) Open addressing hash table with second hash function $h_2(x) = 7 - (x \text{ mod } 7)$.
- (16)
14. (a) (i) Insert the following words into an initially empty binary search tree.
Switzerland, Illinois, Delhi, London, Chicago, Pune, France, Chennai, Hyderabad, Bangalore, Coimbatore, Washington, Los Angeles, Melbourne. (6)
(ii) Briefly explain single rotation and double rotation of AVL tree with examples. (10)

Or

- (b) (i) Find shortest path from A to all other vertices in the following graph by applying Dijkstra's algorithm (Costs for edges are given in numbers). (8)



- (ii) Explain topological sort with example. (8)

15. (a) (i) Write a routine for merge sort and explain with an example. (10)

- (ii) Sort the following using shell sort.
18, 32, 12, 5, 38, 33, 16, 2 (6)

Or

- (b) (i) Enumerate insertion sort algorithm with an example. (8)

- (ii) Sort the following values using quick sort by choosing first element as the pivot.
65, 70, 75, 80, 85, 60, 55, 50, 45 (8)
