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BICS-029

60700

DIPLOMA IN COMPUTER SCIENCE AND TECHNOLOGY (DCSVI)/ADVANCED LEVEL CERTIFICATE COURSE IN CSE (ACCSVI)

Term-End Examination

June, 2012

BICS-029 : ALGORITHMS AND LOGIC DESIGN

Time : 2 Hours *Maximum Marks : 70*

Note : *Attempt **any five** questions. and question number 1 is **compulsory** which is multiple choice questions.*

1. Choose the correct answer from the four given alternatives.

(a) The best average behaviour as per time complexity is shown by : **2**

(i) Quick sort

(ii) Merge sort

(iii) Heap sort

(iv) Insertion sort

(b) What is the maximum total number of nodes in a tree that has N levels ? Note that the root is level (Zero) : **2**

(i) 2^{2n}

(ii) $2^{N+1}-1$

(iii) 2^{N}

(iv) $2^{N} - 2N$

(c) The average number of comparisons in sequential search is : 2

(i) n^2

(ii) $\frac{n(n-1)}{2}$

(iii) $\frac{n(n+1)}{2}$

(iv) $\frac{n+1}{2}$

(d) The average computing time of heap sort is : 2

(i) $O(n^2)$

(ii) $O(n \log_n)$

(iii) $O(\log_n)$

(iv) $O(n^3)$

(e) The worst case time complexity of insertion sort is : 2

(i) $O(n^2)$

(ii) $O(n \log_n)$

(iii) $O(n^3)$

(iv) $O(\log_n)$

(f) Which of the following algorithm design techniques is used in finding all pair shartest distance in a graph ? 2

(i) Dynamic programming

(ii) Back tracking

(iii) Greedy method

(iv) Divide and Conquer

(g) What is the name of output code from either a compilar or an assembler ? 2

(i) Source code

(ii) Object code

(iii) Op-code

(iv) Psuedo code

2. (a) What do you mean by analysis of an algorithm ? Write an algorithm for binary search tree and analyse it. 7

(b) Differentiate between straight sequential search and binary search technique with example. 7

3. (a) Write divide and conquer approach for binary search and calculate it's average time complexity. 7

(b) Explain all the stages of Program Development Life Cycle. 7

4. (a) What is the complexity ? Write the types of complexity and also explain Big-oh and Big-omega notations. 7

(b) Solve the Recurrence relation using iteration method. 7

$$T(n) = K.T\left(\frac{n}{k}\right) + n^2$$

Where T = 1 and K is any constant

5. (a) Draw a flow chart to arrange N-numbers in descending order. 7

(b) Write an algorithm for quick sort. Analyse the time complexity of your algorithm. 7

6. (a) Write an algorithm for deleting duplicate numbers from a leaner array. 7

(b) Describe in brief the garbage collection and compaction. 7

7. (a) Write Pseudo code for selection sort. 7

(b) Write an algorithms for merge sort. Sort the following values as per your algorithm 2,3,7,4,6,1,9,5 . 7

8. Write short notes on ***any four :*** **4x3½=14**

(a) Shell sort

(b) Bucket sort

(c) Recursive algorithm

(d) Component of Flow Chart

(e) Algorithm validation

(f) Bubble sort