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

Term-End Examination

December, 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 given four alternatives.

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

      (i) n^2

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

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

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

(b) An example of hierarchical data structure is :   2

    (i) Array

    (ii) Linked list

    (iii) Tree

    (iv) Ring

(c) Some Software tools used in developing computer programs are :   2

    (i) Text editor

    (ii) Compiler and Assembler

    (iii) Operating system

    (iv) All of above

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

    (i) $O(n^2)$

    (ii) $O(n \log_n)$

    (iii) $O(n^3)$

    (iv) $O(\log_n)$

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

    (i) $O(n^2)$ (ii) $O(n \log_n)$

    (iii) $O(\log_n)$ (iv) $O(n^3)$

(f) The algorithm which requires a fixed amount of storage is :   2

    (i) Heap Sort

    (ii) Quick Sort

    (iii) Both of the above

    (iv) None of the above

(g) What is the name of output from either a   2
compiler or an assembler.

    (i) Source Code

    (ii) Object Code

    (iii) Op-Code

    (iv) Operand

2. (a) Show the steps in heap sort to arrange   7
following data in Ascending order.

    1, 2, 5, 6, 9, 8, 7

  (b) Discuss the basic steps in the complete   7
development of an algorithm.

3. (a) Differentiate between binary search and   7
fibonacci search technique.

  (b) Write an algorithm for Selection Sort. And   7
measure it's complexity in Best, Average
and Worst case.

4. (a) Describe the properties and requirements of   8
a good algorithm. Write big-oh complexity
order classification in increasing order of
time.

  (b) Solve the following recurrence relation.   6
Using iteration method $T(n) = T(n+1) + n^4$.

5. (a) Write pseudo code for Bubble Sort.   6

  (b) Write an algorithm for quick sort. Analyze   8
the complexity of your algorithm.

6. (a) Write an algorithm and draw Flow Chart **10**
to generate all numbers which are divisible
by 3 but not by 7.

   (b) What is the need of Programming **4**
Language ?

7. (a) Explain in brief the space and time **7**
complexity.

   (b) Explain Binary Search Tree (BST) and **7**
analyze the algorithm of BST.

8. Write short notes on *any four* : **3½x4=14**

   (a) Linear programming

   (b) Approximation algorithm

   (c) Randomized algorithm

   (d) Bucket sort

   (e) Shell sort

   (f) Branch and Bound

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