Reg. No. : | | | | | | | | | | |

Question Paper Code: 41202

M.E. DEGREE EXAMINATION, DECEMBER 2014.

First Semester

Computer Science and Engineering

14PCS101 – ANALYSIS OF ALGORITHMS AND DATA STRUCTURES

[Common to Computer Science and Engineering (With Specialization in Networks)]

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (5 x 1 = 5 Marks)

1. The time factor when determining the efficiency of algorithm is measured by
   (a) Counting microseconds (b) Counting the number of key operations
   (c) Counting the number of statements (d) Counting the kilobytes of algorithms

2. Which of the following statements concerning heaps is not true?
   (a) Traversing a heap in order provides access to the data in numeric or alphabetical order
   (b) Removing the time at the top provides immediate access to the key value with highest (or lowest) priority.
   (c) Inserting an item is always done at the end of the array, but requires trickleup() to maintain the heap rule.
   (d) A heap may be stored in an array

3. The complexity of binary search algorithm is
   (a) O (n) (b) O (log) (c) O (n^2) (d) O (n log n)

4. Finding the location of the element with a given value is:
   (a) Traversal (b) Search (c) Sort (d) None of above

5. Two dimensional arrays are also called
   (a) Tables arrays (b) Matrix arrays
   (c) Both of above (d) None of above

PART - B (5 x 3 = 15 Marks)

6. Write about recursive algorithm.

7. Define Skew Heaps.

8. What is the minimum number of nodes in an AVL tree of height 5?

9. How the tree is different from graph?

10. State the advantages of parallel algorithms.

PART - C (5 x 16 = 80 Marks)

11. (a) Describe about the Asymptotic notations of algorithm and state the properties of each notations. (16)

Or

(b) Write short notes on:

(i) NP - Completeness. (8)

(ii) Non – Recursive algorithm. (8)

12. (a) (i) Write the routine for sorting n elements in increasing order using heap. (6)

(ii) Construct the Max heap for the data given below:
3, 1, 4, 1, 5, 9, 2, 6. (10)

Or

(b) Explain in detail about Fibonacci heaps with suitable example. (16)

13. (a) Write the procedure to implement single and double rotations while inserting nodes in an AVL tree. Explain it with example. (16)

Or

(b) Discuss about how the nodes are inserted and deleted in B – trees with an example. (16)

14. (a) (i) Explain in detail about computing the overlay of two subdivisions. (8)

(ii) Write about Range trees. (8)

Or

(b) Describe about K – d trees with an example. (16)

15. (a) (i) Write a parallel algorithm for matrix multiplication. (8)

(ii) Explain in detail about Flynn's classification. (8)

Or

(b) Describe in detail about prefix sum on mesh and butterfly algorithms. (16)