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**C Reg. No. :**

**Question Paper Code: 51P31**

M.E. DEGREE EXAMINATION, NOV 2017

First Semester

Computer Science and Engineering

15PCS101 -ANALYSIS OF ALGORITHMS AND DATA STRUCTURES

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 1= 5 Marks)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1. | The Θ notation in asymptotic evaluation represents \_\_\_\_\_\_ | | | | CO1- R |
|  | (a) Best case | (b) Average case | | (c) Worst case | (d) Null case |
| 2. | A \_\_\_\_\_\_\_\_\_\_\_\_\_is a complete binary tree such that if it is not empty, each element has a data member called key. | | | | CO2- R |
|  | (a) Min-Max heap | (b) Min heap | | (c) Max heap | (d)Sorted heap |
| 3. | Tries is an efficient information \_\_\_\_\_\_\_\_\_\_data structures. | | | | CO3- R |
|  | (a) Retrievel | (b)Fetching | | (c) Collecting nodes | (d)Searching |
| 4. | Our goal is to compute the\_\_\_\_\_\_\_\_\_\_\_\_ for the overlay *O*(S1, S2). | | | | CO4- R |
|  | (a) DCEL | (b) DAEL | | (c) DDEL | (d) DCAL |
| 5. | A heap is an array object that can be viewed as a nearly | | | | CO5- R |
|  | (a) Complete binary tree | | (b) Binary tree | (c) Search tree | (d) Segment tree |

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|  | PART –B (5 x 3= 15 Marks) | | | |
| 1. | Write nonrecursive algorithm for the Tower of Hanoi puzzle. CO1- Ana | | | |
| 2. | Construct the delete min operation for min/max heap (1,2,3,4,5) CO2- App | | | |
| 3. | Define Binary search tree. CO3-U | | | |
| 4. | Define Convex hull. CO4- U | | | |
| 5. | Define PRAM .Name the memory access in PRAM.CO5- U | | | |
|  | PART –C (5 x 16= 80 Marks) | | | |
|  |  |  |  |  |
| 6. | (a) | Consider the problem of finding the value of the largest element in a list of n numbers using Mathematical analysis of Nonrecursive algorithm. | CO1- App | (16) |
|  |  | Or |  |  |
|  | (b) | Solve Analysis of Recursive algorithm using appropriate algorithm. | CO1- App | (16) |
|  |  |  |  |  |
| 7. | (a) | Write a Program for Leftist tree insertion and deletion with example. | CO-2 Ana | (16) |
|  |  | Or |  |  |
|  | (b) | Write a Program for skew insertion and give a neat example. | CO-2 Ana | (16) |
|  |  |  |  |  |
| 8. | (a) | Construct the AVL tree for the days in a week and check the trees are balanced. | CO-3 App | (16) |
|  |  | Or |  |  |
|  | (b) | Construct 2-3 tree by inserting 1,2,3,4,5,6,7,8,9 and delete 9 . | CO-3 App | (16) |
|  |  |  |  |  |
| 9. | (a) | Explain Voronoi Diagram in detail with neat diagram. | CO4- U | (16) |
|  |  | Or |  |  |
|  | (b) | Explain K-D tree and give applications of K-D tree. | CO4- U | (16) |
|  |  |  |  |  |
| 10. | (a) | Explain flynn’s classification in detail. | CO5- U | (16) |
|  |  | Or |  |  |
|  | (b) | Explain Prefix sum on mesh and butterfly . | CO5 -U | (16) |