

Paper Id:

110517

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BTECH
(SEM V) THEORY EXAMINATION 2019-20
DESIGN AND ANALYSIS OF ALGORITHM

Time: 3 Hours**Total Marks: 100****Note: 1. Attempt all Sections.****SECTION A****1. Attempt all questions in brief. 2 x 10 = 20**

a.	What do you mean by Algorithm?
b.	Write worst-case and best-case complexity of insertion sort.
c.	Define Binomial Heap with example.
d.	Write short note on Binary Search Tree.
e.	Describe Activity selection problem.
f.	How BFS is differ from DFS.
g.	Write short note on Boyer-Moore algorithm.
h.	Describe convex hull problem,
i.	What do you mean by maximum flow?
j.	Define Computational Geometry.

SECTION B**2. Attempt any three of the following: 10x3=30**

a.	Solve the recurrence relation by substitution method $T(n) = 2T(n/2) + n$
b.	What is Fibonacci Heap? Discuss the application of Fibonacci Heap.
c.	Define the terms—LCS, Matrix Chain multiplication & Bellman-Ford algorithm.
d.	Describe TSP? Show that a TSP can be solved using backtracking method in exponential time.
e.	Write an algorithm of Naïve Matching and implement it by any example.

SECTION C**3. Attempt any one part of the following: 10x1=10**

a.	Sort the following array using Heap-Sort techniques— 5,8,3,9,2,10,1,35,22
b.	Discuss in brief Asymptotic Analysis with best, average & worst case complexities.

4. Attempt any one part of the following: 10x1=10

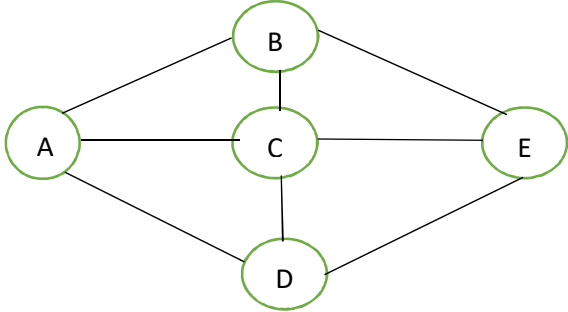
a.	Define a B-Tree of order m. Explain the searching operation in a B-Tree.
b.	Write the properties of Red-Black Tree. Illustrate with an example, how the keys are inserted in an empty red-black tree.

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5. Attempt any *one* part of the following: 10x1=10

a.	Write an algorithm for minimum spanning tree with example.
b.	Consider a graph $G=(V,E)$. We have to find a Hamiltonian cycle using backtracking method. <div style="text-align: center; margin: 10px 0;">  </div>

6. Attempt any *one* part of the following: 10x1=10

a.	Consider $I=\langle I_1, I_2, I_3 \rangle$; $W=\langle 5, 4, 3 \rangle$; $V=\langle 6, 5, 4 \rangle$ and $W=7$, we have to pack this knap-sack using the branch and bound technique.
b.	Explain the Floyd Warshall algorithm with an example.

7. Attempt any *one* part of the following: 10x1=10

a.	Explain the classes P, NP, NPC and NP hard. How are they related to each other?
b.	Write short notes on – (a) Approximation Algorithms. (b) Randomized Algorithms.