**SESSION FEB/MARCH-2022**

**PROGRAM- MCA**

**SEMESTER- III**

**COURSE CODE NAME DCA7104 Analysis and Design of Algorithms**

**SET-I**

**Questions Mark**

**1. A. What are the properties of an algorithm? Explain branch and bound algorithm with an example.**

**Ans: Properties of algorithms**

An algorithm may have zero or more inputs externally and it should produce one or more output. Also, an algorithm must terminate after a finite number of steps. Properties of the algorithm include:

**• Correctness –** It should provide correct and accurate output for all legitimate input.

**• Definiteness –** Each Its Half solved only

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**B. What is the general plan to analyse the efficiency of recursive algorithms?**

**Ans:** Analyzing efficiency of recursive algorithms Let us see the general plan for analyzing the efficiency of recursive algorithms. The steps are as follows:

1) Decide the size of the input based

**2. Differentiate between bottom-up and top-down heap construction with example.**

**Ans:**

***Bottom-up heap construction***

It initializes the essentially complete binary tree with n nodes by placing keys in the order given and then “heapifies” the tree as follows. Starting with the last parental node and ending with the root, the algorithm checks whether the parental

**3. A. How is Divide and Conquer a better method for sorting?**

**Ans:** Insertion sort is a simple algorithm that implements the decrease and conquers methodology. Insertion sort executes in O(n2) time, but it’s about twice as fast as the bubble sort and somewhat faster than the selection sort in norm

**SET-II**

**Questions Mark**

**4. A. Explain distribution counting with an example.**

**Ans:** Distribution counting is an input enhancement method wherein a separate array is used to store the information generated during the sorting process and these arrays enhance the sorting process. Horspool’s and Boyer-Moore algorithms are string matching algorithms where in the pattern is compared with the text

**B. Explain the algorithm to solve the Knapsack problem using the dynamic programming method.**

**Ans: Given a knapsack with following:**

M-capacity of the knapsack

n-number of ojects

w- an array consisting of weights w1,w2…wn

p- an array consisting of

**5. Explain the dynamic programming approach to find binomial coefficients**

**Ans:** Let us use dynamic programming approach to solve this problem. Let a1, a2…an be the distinct elements given in ascending order and let p1, p2…pn be the probabilities of searching the elements. Let c[i,j] be the smallest average number of comparisons made in a binary search tree elements ai….aj,

**6. A. Describe greedy choice property.**

**Ans: Greedy Choice Property**

o In greedy algorithms a globally optimal solution is arrived by making a locally optimal (greedy) choice. That is to say when considering which choice to make, the choice that looks best in the current problem, without

**B. Explain the sorting problem with the help of a decision tree**

**Ans:** Decision tree means to represent a program in the form of tree with branches. Here each node represents a decision. First the root node is tested and then the control is passed to one of its subtrees, depending on the result of the test. This flow is continued till the leaf node with the element of interest is reach