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Ans: to: the: S: No: 1

(a) Ans: As we study Algorithms, we can learn analysis that allow as to Compare and Contrast Solutions based solely on their own characteristics not the characteristics of the Programme or Computer used to implement them. Computer scientists learn by experience, we learn by seeing others solved problems & by solving problems by Ourselves being exposed to different problem - Solving techniques & how different Algorithms are desined helps us to take on the next challenging problem that we are given.

Applications of Algorithm: ⇒ Here we will see some of the Practicale of the algorithm.

→ First we will short with the internet which is very much important for our daily life & we cannot even imagine Our life with out the internet & it is the Out income of clever & creative algorithms. Name now sites on the internet can Operat & falsity this huge number of data. Only with the help.

⇒ The everyday electronic Commerce Activities are massively subject to our data, for example, credit or debit Card numbers, passwords OTPs, & many more. The centre technologies used incorporate public-key cry. procurrency & Digital signatures which depend on mathmatical Algorithms.

⇒ Even an application that doesn't need Algorithm content at the Application level depends vigorously on the algorithm as the Application that doesn't relies upon Heardwere, GUI, networking, on object Direction & all of they create a substantion as of Algorithm.

⇒ There are some others vital use case where the Algorithm has been used such as it we watch any video on youtube then next time we will get related-type Advice as recomended videos for us.

1 (b) Ans: Data flow analysis is a process for collecting information about the use definition, & dependencies of data in programme. The Data flow analysis algorithms operates on a CFG generated from an AST. You can use a CFG to determine the part of a programme to which a particular value assigned to a variable might propagate.

Data flow analysis is a technique for a gathering information about the possible set of values Calculated at various points in a Computer programme. A programme Control flow graph (CFG) is used to determine these part often used of Compailer when optimizing a programme. A Canonical example of Dat-flow analysis re-changing defination. A simple way to Perform data flow analysis of programme is to set-up data flow equation.

Reaching defination analysis they analysis tracker the defination of variable or expression & determine the point in the programme, where the defination "reaches" a Particuler the point of the variable expression. The information Can be used to identify variable that can be used to safely of optimized or eliminited.

Difference Between Algorithm & Pseudocodes :-

Algorithm	Psedocode
* It is a step by step description the Solutions.	* It is an easy way of writing algorithm for users to understand.
* It is always a real algorithm a not fake codes.	* These are fake codes.
* They are sequence of solution to a problem.	* They are representations of algorithm.
* It is a systematically written code.	* They are simple ways of writing codes.
* They are an unambiguous way of writing codes.	* They are method of describing code written is an algorithm.
* They can be considered Psedocode.	* They can not considered Algorithm.
* There are no rules to writing Algorithm.	* Certain rules to writing pseudocode are their,

1.

(C) Ans: <u>Types of algorithms:</u> Here is 7 types of algoritm :-

① Brute force Algorithm.

② Recursive Algorithm.

③ Dynamic programming Algorithm.

④ Divide & conquer Algorithm.

⑤ Greedy Algorithm.

⑥ Backtracking Algorithm.

⑦ Randomized Algorithm.

<u>Greedy Algoritm:</u> A greedy algorithm is an approach for solving a problem by selecting the best option available at the moment. It does not worry whethere the current best result with bring the overall optimal result the algorithm the earlier decision even if the chice is working in a top-down approach.

There are few variation of the greedy Algorithm.

→ pure greedy Algorithm.

→ Orthogonal greedy algorithm.

→ Relaxed greedy algorithm.

2 a ans! Searching Algorithm: In computer since Search Algorithm is an Algorithm designed to solved a Search problem - Search algorithm work to retrieve information stored within particular data structure or calculated in the search space of a problem domain, with either discrete or continuous values.

Sorting algorithm! In Computer science, a sorting Algorithm is an Algorithm that pets elements of a list into an order. The most frequency used orders are numerical order & lexicographical Orders feither Ascending or discending. A shorting algorithm is used to rearrange a given array or list of element According to a Comparison Operator on the elements. The comparison Operator is used to deside the new Order of elements in the respective data structure.
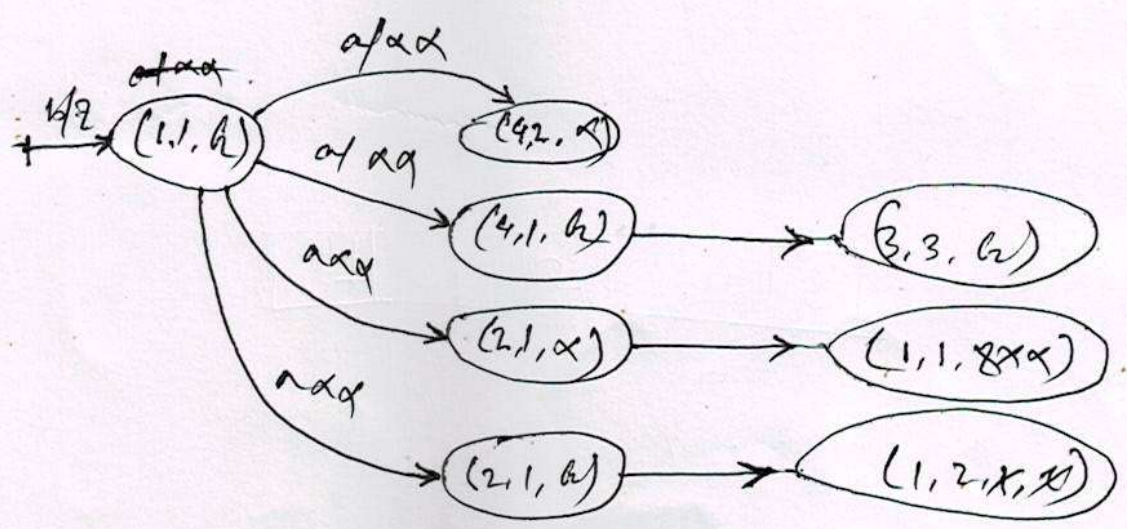
-1	0	1	2	3	4	8

Array sorted in crossing order.

2
b Ans: Function an Algorithm: An Algorithm is a recipe or Description of mechanical set of stem for performing some task. A function is any relationship between inputs and Outputs in which each input bads to exactly one Output. It is possible for a function to have more then one input that yeilds that some Output.

$\Rightarrow$ Function in Algorithm:

* $\rightarrow$ First define the problems you want the algorithm to solved.

\# $\rightarrow$ Break the problems down into smaller, manageable, steps

* $\rightarrow$ White your algorithm in psedocode or programming language.

* $\rightarrow$ Test your Algorithm to make sure it is correct and efficient.

* $\rightarrow$ Optimize the Algorithm.

2 **c** Ans: <u>Mathmatical Algorithm</u>: An algorithm in math is a procedure, a description of a set of steps that can be used to solve a method Computation, for example a <u>Step</u> by step procedure used in long division is Common example of a mathmatical Algorithm.

```
    2.
  4   5
 x    7
  8 3 5
```

<u>Graph Algorithm</u>: Graph algorithm are a set of instruction that travers graph, Some algorithm, are used to find a specific node on the path between two given nodes. An abstract way of representing Connectivity using nodes (also called venties) and edges. Will will (lable the nodes from 1 to n. m edges connect some pairs of nodes - nodes on edges can have some auxiliary information
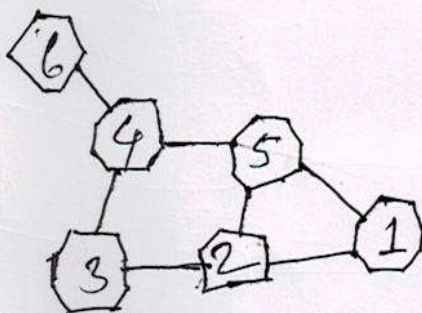

Fig: Graph algorithm.