

Victoria University of Bangladesh
Department of Computer Science & Engineering

Name: Ashit Kumar

Student ID: 2221220011

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Course Code: CSI-227

Course Title: Algorithm

(1)

Answer to the question no: 1 (a)

(1) (a) Ans: Algorithms: An algorithm is a set of instructions for solving a problem accomplishing a task. One common example of an algorithm is a recipe, which consists of specific instructions for preparing a dish or meal.

Categories of an algorithm: The seven types of algorithms are the brute force based algorithm, greedy, algorithm, recursive algorithm, backtracking algorithm, divide and conquer algorithm, dynamic programming algorithm, and randomized algorithm.

Characteristics of algorithm: The (4) characteristics of an algorithm: Unambiguity, fineness, effectiveness, and language independence are some of the characteristics of an algorithm.

(2)

Answer to the question no: 1(b)

1. (b) Ans: Disadvantages of algorithms:

- # Algorithm is time consuming.
- # Difficult to show branching and looping in algorithms.
- # Big tasks are difficult to put in Algorithms.

2. (b) Ans: Advantages of Algorithms:

- # It is a step-wise representation of a solution to a given problem, which makes it easy to understand.
- # An algorithm uses a definite procedure.
- # It is not dependent on any programming language, so it is easy to understand for anyone even without programming knowledge.

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Answer to the question no: 1(c)

1. (c) Ans: Types of Algorithm: The seven types of algorithms are the brute force-based algorithm, greedy algorithm, recursive algorithm, backtracking algorithm, divide and conquer algorithm, dynamic programming algorithm and randomized algorithm.

1. (c) Ans: Greedy algorithm: A greedy algorithm is an approach for solving a problem by selecting the best option available at the moment. It doesn't worry whether the current best result will bring the overall optimal result. The algorithm never reverses the earlier decision even if the choice is wrong. It works in a top-down approach.

(1)

Answer to the question no: 2 (a)

2: (a) Ans: Searching Algorithm: A search algorithm is the step-by-step procedure used to locate specific data among a collection of data. It is considered a fundamental procedure in computing. In computer science, when searching for data, the difference between a fast application and a slower one often lies in the use of the proper search algorithm.

Ans: Sorting Algorithms A sorting algorithm is a method for reorganizing a large number of items into a specific order, such as alphabetical, highest-to-lowest value or shortest-to-longest distance. Sorting algorithms take lists of items as input data, perform specific operations on those lists and deliver ordered arrays as output.

(5)

Answer to the question no:2 (b)

2. (b) Ans: Huffman coding: Huffman coding is a method of data compression that is independent of the data type, that is, the data could represent an image, audio or spreadsheet. This compression scheme is used in JPEG and MPEG-2. Huffman coding works by looking at the data stream that makes up the file to be compressed.

Answer to the question no:2 (c)

2. (c) Ans: Mathematical Algorithm: A procedure for solving a mathematical problem (as of finding the greatest common divisor) in a finite number of steps that frequently involves repetition of an operation. broadly: a step-by-step procedure for solving a problem or accomplishing some end.

Graph Algorithm: A graph is an abstract notation used to represent the connection between pairs of objects. A graph consists of - vertices - interconnected objects in a graph are called vertices. Vertices are also known as nodes. Edges - Edges are the links that connect the