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**VU Answer**

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An optimization problem is one in which you want to find,

moaaz

Answer ( Please select your correct option )

**VuAnswers.com**

Not a solution

An algorithm

Good solution

The best solution

correct

**Made by: Waqar Siddhu**

Suppose that a graph  $G = (V, E)$  is implemented using adjacency lists. What is the complexity of a breadth-first traversal of  $G$ ?

page 116

VuAnswers.com

Answer ( Please select your correct option )

$O(|V|^2)$

$O(|V| + |E|)$

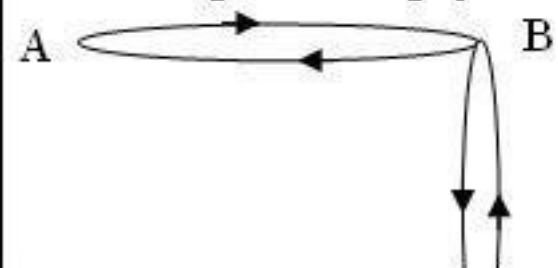
$O(|V|^2|E|)$

$O(|V| + |E|)$

correct

Made by: Waqar Siddhu

The total degrees of the graph is



Answer ( Please select your correct option )

VuAnswers.com

3

5

6

9

Made by: Waqar Siddhu





Answer ( Please select your correct option )

VuAnswers.com

 3 5 6 9**Made by: Waqar Siddhu**



Answer ( Please select your correct option )

VuAnswers.com

3

5

6

9

Made by: Waqar Siddhu

Non-optimal or greedy algorithm for money change takes \_\_\_\_\_

Answer ( Please select your correct option )

VuAnswers.com

$O(k)$

correct

$O(2^k)$

$O(N)$

$O(kN)$

Made by: Waqar Siddhu

The Huffman algorithm finds a (n) \_\_\_\_\_ solution.

102

VuAnswers.com

Answer ( Please select your correct option )

Optimal

correct

Non-optimal

Exponential

Polynomial

**Made by: Waqar Siddhu**

Which formula is used for calculating worst case running time?

Answer ( Please select your correct option )

VuAnswers.com

$T_{worst}(n) = \max_{|I|=n} T(I)$

correct

$T_{worst}(n) = \max_{|I|=1} T(I)$

$T_{worst}(n) = \max_{|I|=1} T(n)$

$T_{worst}(n) = \max_{|I|=n} T(n)$

Made by: Waqar Siddhu

The reason for introducing Sieve Technique algorithm is that it illustrates a very important special case of,

34

Answer ( Please select your correct option )

VuAnswers.com

divide-and-conquer

correct

decrease and conquer

greedy nature

2-dimension Maxima

**Made by: Waqar Siddhu**

Sieve Technique applies to problems where we are interested in finding a single item from a larger set of \_\_\_\_\_

34

Answer ( Please select your correct option )

VuAnswers.com

n items

correct

phases

pointers

constant

Made by: Waqar Siddhu



The number of nodes in a complete binary tree of height  $h$  is

Answer ( Please select your correct option )

VuAnswers.com

$2^{(h+1)} - 1$

correct

$2 * (h+1) - 1$

$2 * (h+1)$

$((h+1) ^ 2) - 1$

Made by: Waqar Siddhu



If there are  $\Theta(n^2)$  entries in edit distance matrix then the total running time is

Answer ( Please select your correct option )

VuAnswers.com

$\Theta(1)$

$\Theta(n^2)$

correct

$\Theta(n)$

$\Theta(n \log n)$

Made by: Waqar Siddhu

When a recursive algorithm revisits the same problem over and over again, we say that the optimization problem has \_\_\_\_\_ sub-problems.

Answer ( Please select your correct option )

VuAnswers.com

Overlapping

correct

Over costing

Optimized

None of these

Made by: Waqar Siddhu

A  $p \times q$  matrix  $A$  can be multiplied with a  $q \times r$  matrix  $B$ . The result will be a  $p \times r$  matrix  $C$ . There are  $(p \cdot r)$  total entries in  $C$  and each takes \_\_\_\_\_ to compute.

Answer ( Please select your correct option )

VuAnswers.com

(q)

correct

(1)

( $n^2$ )

( $n^3$ )

Made by: Waqar Siddhu

Matrix – Chain – Order is \_\_\_\_\_ than the exponential time method of enumerating all possible parenthesizations and checking each one.

Answer ( Please select your correct option )

VuAnswers.com

Much more efficient

Only fractional efficient

Worst

Too slow

**Made by: Waqar Siddhu**

The recurrence relation of Tower of Hanoi is given below

$$T(n) = \begin{cases} 1 & \text{if } n=1 \\ 2T(n-1)+1 & \text{if } n>1 \end{cases}$$

In order to move a tower of 4 rings from one peg to another, how many ring moves are required?

Answer ( Please select your correct option )

VuAnswers.com

15

7

12

32

correct

Made by: Waqar Siddhu

Maximum number of edges in a Directed Graph may be

Answer ( Please select your correct option )

VuAnswers.com

V

2V

Approximately  $|V^2|$

correct

$\sqrt{V}$

Made by: Waqar Siddhu



An adjacency matrix for a graph

Answer ( Please select your correct option )

VuAnswers.com

always square in shape

It is not necessary for it to be square in shape

correct

Is square in shape for directed graphs but not for undirected graphs

Is always diagonal matrix

Made by: Waqar Siddhu

Using ASCII standard the string "ab-#\$c" will be encoded \_\_\_\_\_ bytes

Answer ( Please select your correct option )

VuAnswers.com

16

7

6

This string cannot be stored using ASCII standard

correct

**Made by: Waqar Siddhu**



Using Huffman encoding technique the string "a@\$a" will be encoded with \_\_\_\_\_ bits

Answer ( Please select your correct option )

VuAnswers.com

5

6

8

Huffman encoding fail at this string

correct

**Made by: Waqar Siddhu**

In fractional knapsack we sort the

Answer ( Please select your correct option )

VuAnswers.com

Value per unit weight in decreasing order

correct

Weight per unit value in decreasing order

Value per unit weight in increasing order

Weight per unit value in increasing order

Made by: Waqar Siddhu

The greedy part of the Huffman encoding algorithm is to first find two nodes with \_\_\_\_\_ frequency.

Answer ( Please select your correct option )

VuAnswers.com

Larger

Smallest

correct

Balance

Character

**Made by: Waqar Siddhu**

The codeword assigned to characters by the Huffman algorithm have the property

Answer ( Please select your correct option )

VuAnswers.com

that no codeword is the prefix of any other

correct

that no codeword is the postfix of any other

that no codeword is the infix of any other

that no codeword is neither prefix nor postfix of any other

Made by: Waqar Siddhu

In undirected graphs there

130

Answer ( Please select your correct option )

VuAnswers.com

are no Cross edges but have forward and back edges

are only forward edges

is convention of only back edges

correct

is convention of forward edges

Made by: Waqar Siddhu

In time stamp DFS for the edge  $(u,v)$  if  $f(u) > f(v)$  then

130

VuAnswers.com

Answer ( Please select your correct option )

the edge is cross

the edge is back

the edge is forward

the edge is tree or cross or forward

correct

**Made by: Waqar Siddhu**



Kruskal's algorithm

Answer ( Please select your correct option )

VuAnswers.com

Choose the best non-cycle edge

correct

Choose the best tree edge

Choose the vertex that gives the lightest weight

Follow the dynamic programming rules for choosing edges

Made by: Waqar Siddhu

In Prim's algorithm we use

Answer ( Please select your correct option )

VuAnswers.com

Queue data structure

Priority Queue data structure

Stack data structure

Both stack and Queue data structures

correct

Made by: Waqar Siddhu



Adding any edge to a free tree

142

VuAnswers.com

Answer ( Please select your correct option )

keeps it the free tree and increases the size of the tree

creates a unique cycle

correct

it is not allowed to add the edge in free tree

creates multiple cycles

**Made by: Waqar Siddhu**

Floyd-Warshall algorithm is

161

VuAnswers.com

Answer ( Please select your correct option )

based on greedy approach and allow negative edges

based on divide and conquer approach and allow negative edges

based on dynamic programming approach and allow negative cycles

based on dynamic programming approach and allow negative edges

correct

**Made by: Waqar Siddhu**

Dijkstra's algorithm is used for

154

VuAnswers.com

Answer ( Please select your correct option )

calculating multiple source shortest path problems

calculating Minimum spanning tree

shortest and Minimum Spanning tree both can be calculated by it

single source shortest path problems

correct

**Made by: Waqar Siddhu**

Bellman Ford algorithm applies relaxation to every

160

VuAnswers.com

Answer ( Please select your correct option )

edge of the graph and repeats exactly  $v-1$  times

correct

vertex of the graph and repeats exactly  $E-1$  times

edge of the graph and repeats exactly  $E-1$  times

edge but use the back edges for the completion

Made by: Waqar Siddhu

Complexity wise the comparison based merge and quick sort algorithms fall in

Answer ( Please select your correct option )

VuAnswers.com

Deterministic Polynomial class

Non-Deterministic Polynomial class

Quick sort in P class and Merge sort in NP class

Quick sort in NP class and Merge sort in P class

**Made by: Waqar Siddhu**

Running time of Floyd-Warshall algorithm is

161

VuAnswers.com

Answer ( Please select your correct option )

$\Theta(n^2)$

$\Theta(n^4)$

$\Theta(n^3)$

correct

$\Theta(3^n)$

Made by: Waqar Siddhu



If we can solve a single NP problem in P time

173

Answer ( Please select your correct option )

VuAnswers.com

All NP-problems can be solved

correct

All P problems can be solved

We cannot predict about the solution of other NP problems

This can be never possible to solve the NP problem in P time

**Made by: Waqar Siddhu**

If a problem is NP-complete

Answer ( Please select your correct option )

VuAnswers.com

it must be in P

it must also be in NP

correct

there is no relation between NP and NP-complete

it can be solved in P time

Made by: Waqar Siddhu



3-color problem is known as \_\_\_\_\_

173

VuAnswers.com

Answer ( Please select your correct option )

P



NPC



correct

Co-NP



P and NP



Made by: Waqar Siddhu

Clique cover problem arises in applications of \_\_\_\_\_.

176

VuAnswers.com

Answer ( Please select your correct option )

Map drawing

Clustering

Architectural design

Clique

correct

**Made by: Waqar Siddhu**

In the 3-coloring problem, for two vertices to be in the same group, they must be not \_\_\_\_\_ to each other.

176

Answer ( Please select your correct option )

VuAnswers.com

Apart from

Far from

Near to

Adjacent to

correct

**Made by: Waqar Siddhu**

What is the worst-case time for merge sort to sort an array of  $n$  elements?

Answer ( Please select your correct option )

VuAnswers.com

$O(n \log n)$

correct

$O(n^2)$

$O(\log n)$

$O(n)$

Made by: Waqar Siddhu

Search techniques of various algorithms look at \_\_\_\_\_

97

Answer ( Please select your correct option )

**VuAnswers.com**

Many possible solutions

correct

Maximum 2 possible solutions

Minimum 2 possible solutions

Sorting solutions

**Made by: Waqar Siddhu**

The Huffman encoding algorithm is a \_\_\_\_\_

99

VuAnswers.com

Answer ( Please select your correct option )

Dynamic and greedy algorithm

Divide and conquer and greedy algorithm

Geedy algorithm.

correct

Dynamic programming algorithm

Made by: Waqar Siddhu



Breadth first search is shortest path algorithm that works

153

VuAnswers.com

Answer ( Please select your correct option )

on un-weighted graphs

correct

on weighted graphs

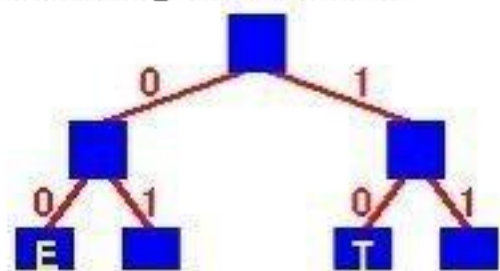
on both weighted and un-weighted graphs

BFS cannot be used for shortest path problems

**Made by: Waqar Siddhu**



Consider the following Huffman Tree



Answer ( Please select your correct option )

VuAnswers.com

10 00 010

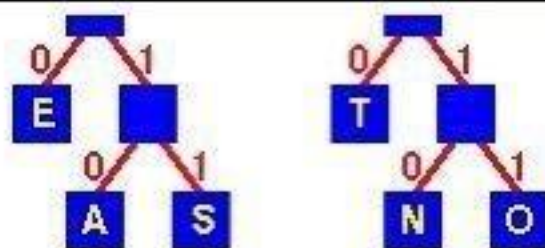
correct

011 00 010

10 00 110

11 10 110

Made by: Waqar Siddhu



The binary code for the string "TEA" is

Answer ( Please select your correct option )

VuAnswers.com

10 00 010

correct

011 00 010

10 00 110

11 10 110

Made by: Waqar Siddhu

Total running time of BFS is

Answer ( Please select your correct option )

VuAnswers.com

$O(V + E)$

correct

$O(V - E)$

$O(VE)$

None of these

Made by: Waqar Siddhu

Total running time of BFS is

Answer ( Please select your correct option )

VuAnswers.com

$O(V + E)$

correct

$O(V - E)$

$O(VE)$

None of these

Made by: Waqar Siddhu

Using ASCII standard the string "abacdaacac" will be encoded with \_\_\_\_\_ bits.

Answer ( Please select your correct option )

VuAnswers.com

80

correct

160

320

100

Made by: Waqar Siddhu

Consider the string "abacdaacac" if the string is coded with ASCII codes using Huffman encoding scheme, the message length would be

Answer ( Please select your correct option )

VuAnswers.com

8 bits

80 bits

correct

Less than 50 bits

More than 50 bits

Made by: Waqar Siddhu



What is the asymptotic growth of  $\frac{4n^3 + 15n^2 + 11n}{6}$  ?

Answer ( Please select your correct option )

VuAnswers.com

$\Theta\left(\frac{4n^3 + 15n^2 + 11n}{6}\right)$

$\Theta(4n^3 + 15n^2 + 11n)$

$\Theta(15n^2)$

correct

$\Theta(n^3)$

Made by: Waqar Siddhu

The reason for introducing Sieve Technique algorithm is that it illustrates a very important special case of,

Answer ( Please select your correct option )

VuAnswers.com

divide-and-conquer

**correct**

decrease and conquer

greedy nature

2-dimension Maxima

**Made by: Waqar Siddhu**

Sieve Technique applies to problems where we are interested in finding a single item from a larger set of \_\_\_\_\_

Answer ( Please select your correct option )

VuAnswers.com

n items

correct

phases

pointers

constant

Made by: Waqar Siddhu

A *heap* is a left-complete binary tree that conforms to the \_\_\_\_\_

Answer ( Please select your correct option )

VuAnswers.com

(log n) order

increasing order only

decreasing order only

heap order

correct

Made by: Waqar Siddhu

What is common between Bubble sort, Insertion sort, Selection sort, Quick sort, and Heap sort?

Answer ( Please select your correct option )

VuAnswers.com

All are in-place algorithms

correct

All are stable algorithms

None of these

All are unstable algorithms

Made by: Waqar Siddhu

In in-place sorting algorithm is one that uses no \_\_\_\_\_ arrays for storage.

Answer ( Please select your correct option )

VuAnswers.com

two dimensional

three dimensional

n dimensional

additional

correct

Made by: Waqar Siddhu



The main shortcoming of counting sort is that it is useful for

Answer ( Please select your correct option )

VuAnswers.com

Small Integers

correct

Small characters

Floats

None of these

Made by: Waqar Siddhu

The original recursive algorithm takes  $\Theta(\Phi^n)$  time, where

Answer ( Please select your correct option )

VuAnswers.com

$\Phi = 1.618$

correct

$\Phi = 3.142$

$\Phi = 1.816$

$\Phi = 1.168$

Made by: Waqar Siddhu

Maximum number of edges in a Directed Graph may be

Answer ( Please select your correct option )

VuAnswers.com

- $V$
- $2V$
- Approximately  $|V^2|$   
**correct**
- $\sqrt{V}$

Made by: Waqar Siddhu

The Huffman algorithm finds

Answer ( Please select your correct option )

VuAnswers.com

sometime optimal some time non optimal solution

space wise optimal and time wise non optimal solution

a non-optimal solution

an optimal solution

correct

**Made by: Waqar Siddhu**

The Huffman codes provide a method of encoding data which

Answer ( Please select your correct option )

VuAnswers.com

is efficient and use a variable length codes

is efficient and use fixed length codes i.e. ASCII

correct

is efficient and both ways of variable and fixed length codes can be used

is efficient time wise but not space wise

Made by: Waqar Siddhu

Using ASCII standard the string "abacdaacac" will be encoded with \_\_\_\_\_ bytes.

Answer ( Please select your correct option )

VuAnswers.com

10

16

32

8

correct

Made by: Waqar Siddhu



In fractional knapsack we sort the

Answer ( Please select your correct option )

VuAnswers.com

Value per unit weight in decreasing order

Weight per unit value in decreasing order

Value per unit weight in increasing order

Weight per unit value in increasing order

correct

Made by: Waqar Siddhu

The greedy part of the Huffman encoding algorithm is to first find two nodes with \_\_\_\_\_ frequency.

Answer ( Please select your correct option )

VuAnswers.com

Larger

Smallest

Balance

Character

**correct**

**100**

**Made by: Waqar Siddhu**

In directed graphs the cardinality of edges  $|E| =$

no idea

Answer ( Please select your correct option )

VuAnswers.com

Sum of out-degrees of all the vertices

Sum of in-degrees of all the vertices

First both are true

There is no relation between degree of vertices and no of edges

Made by: Waqar Siddhu

The codeword assigned to characters by the Huffman algorithm have the property

Answer ( Please select your correct option )

VuAnswers.com

that no codeword is the prefix of any other

correct

that no codeword is the postfix of any other

that no codeword is the infix of any other

that no codeword is neither prefix nor postfix of any other

Made by: Waqar Siddhu

In undirected graphs there

For undirected graphs, there is no distinction between forward and back edges. By convention they are all called back edges. Furthermore, there are no cross edges (can you see why not?)

Answer ( Please select your correct option )

VuAnswers.com

are no Cross edges but have forward and back edges

are only forward edges

is convention of only back edges

correct

is convention of forward edges

Made by: Waqar Siddhu

In time stamp traversal we can calculate

Answer ( Please select your correct option )

VuAnswers.com

whether the graph has Cycles

correct

130 pag

total number of cycles on the bases of forward edges

total number of cycles on the bases if back edges

total no of paths of certain length

**Made by: Waqar Siddhu**



In time stamp DFS for the edge  $(u,v)$  if  $f(u) > f(v)$  then

If this edge is a tree, forward or cross edge, then  $f[u] > f[v]$ .

130 page

Answer ( Please select your correct option )

VuAnswers.com

the edge is cross

the edge is back

the edge is forward

the edge is tree or cross or forward

correct

Made by: Waqar Siddhu

Precedence constraint graph is

131 page

Answer ( Please select your correct option )

VuAnswers.com

non acyclic directed graph

acyclic undirected graph

non acyclic undirected graph

acyclic directed graph

correct

Made by: Waqar Siddhu

In Prim's algorithm, the additional information maintained by the algorithm is

Answer ( Please select your correct option )

VuAnswers.com

the length of the shortest path from vertex  $v$  to the vertex  $u$

correct

not sure

the length of the shortest edge from vertex  $v$  to points already in the tree

the dynamic programming rules

the information about all adjacent vertices

Made by: Waqar Siddhu

In strongly connected components the component digraph is

136 page

Answer ( Please select your correct option )

VuAnswers.com

necessarily cyclic

correct

necessarily acyclic

not necessary it can be both cyclic and acyclic

cyclic with some other constraints

Made by: Waqar Siddhu

Floyd-Warshall algorithm is

161

Answer ( Please select your correct option )

VuAnswers.com

based on greedy approach and allow negative edges

based on divide and conquer approach and allow negative edges

based on dynamic programming approach and allow negative cycles

based on dynamic programming approach and allow negative edges

correct

**Made by: Waqar Siddhu**

Dijkstra's algorithm is used for

154 page

Answer ( Please select your correct option )

**VuAnswers.com**

calculating multiple source shortest path problems

calculating Minimum spanning tree

shortest and Minimum Spanning tree both can be calculated by it

single source shortest path problems

correct

**Made by: Waqar Siddhu**



Kruskal's Algorithm has time complexity

149 page

Answer ( Please select your correct option )

VuAnswers.com

overall  $\mathcal{O}(V \log E)$

overall  $\mathcal{O}(E \log V)$  for sparse graph  $\mathcal{O}(V \log E)$

overall  $\mathcal{O}(E \log E)$  and for sparse graph  $\mathcal{O}(E \log V)$

correct

overall  $\mathcal{O}(EV)$  and for sparse graph  $\mathcal{O}(V^2)$

Made by: Waqar Siddhu

Bellman Ford algorithm applies relaxation to every

159 page

Bellman-Ford applies relaxation to every edge of the graph and repeats this  $V - 1$  times.

Answer ( Please select your correct option )

VuAnswers.com

edge of the graph and repeats exactly  $v-1$  times

correct

vertex of the graph and repeats exactly  $E-1$  times

edge of the graph and repeats exactly  $E-1$  times

edge but use the back edges for the completion

Made by: Waqar Siddhu

In NP-problems "NP" represents

The term "NP" does not mean "not polynomial". Originally, the term meant "non-deterministic polynomial"

Answer ( Please select your correct option )

VuAnswers.com

Non-deterministic Polynomials

correct

Null-polynomials

Negative Polynomials

Non-polynomials

Made by: Waqar Siddhu

The recurrence represented by  $T(n) = \sum_{i=0}^n 2 + \sum_{i=0}^n i/2$  has time complexity belongs to

no idea

Answer ( Please select your correct option )

VuAnswers.com

P-Class

NP-Class

Co-NP Class

Unpredictable class

Made by: Waqar Siddhu

The function having complexity  $O(n^n)$  belongs to

Answer ( Please select your correct option )

VuAnswers.com

NP-Class

correct

not sure

Co-Prime Class

P-Class

Both P and NP Classes

Made by: Waqar Siddhu

3-color problem is known as \_\_\_\_\_

137

Answer ( Please select your correct option )

**VuAnswers.com**

P

NPC

Co-NP

P and NP

correct

**Made by: Waqar Siddhu**



Generalize Coloring problem arises in various partitioning problems where there is a constraint

173

Answer ( Please select your correct option )

**VuAnswers.com**

that two objects can not be assigned to the same set of partitions and is belong to NP class

correct

that two objects can not be assigned to the same set of partitions and is belong to P class

of that we can organize the different partitions in P time and NP space

of colors does not effect the classifications

**Made by: Waqar Siddhu**

In the 3-coloring problem, for two vertices to be in the same group, they must be not \_\_\_\_\_ to each other.

176 page

Answer ( Please select your correct option )

**VuAnswers.com**

Apart from

Far from

Near to

Adjacent to

correct

**Made by: Waqar Siddhu**

Sieve Technique can be applied to solve \_\_\_\_\_

35 page

Answer ( Please select your correct option )

VuAnswers.com

Selection problems

correct

Arguement problems

Dynamic problems

Greedy problems

**Made by: Waqar Siddhu**

If an algorithm has a complexity of  $5n + \log_2(\log_2 n) + 10$  for some model of computation (some set of assumptions) and some complexity measures (such as number of comparison operations) we could say that it has complexity

no idea

Answer ( Please select your correct option )

VuAnswers.com

$O(\log_2 n)$

$O(n)$

$O(3 + 1 + 3)$

$O(\log_2(\log_2 n))$

Made by: Waqar Siddhu

Search techniques of various algorithms look at \_\_\_\_\_

97 page

Answer ( Please select your correct option )

VuAnswers.com

Many possible solutions

correct

Maximum 2 possible solutions

Minimum 2 possible solutions

Sorting solutions

**Made by: Waqar Siddhu**

Usually which type of algorithm is harder to prove the correctness?

Answer ( Please select your correct option )

VuAnswers.com

Dynamic programming

Brute Force

correct

solve by comen fact.....not in the book

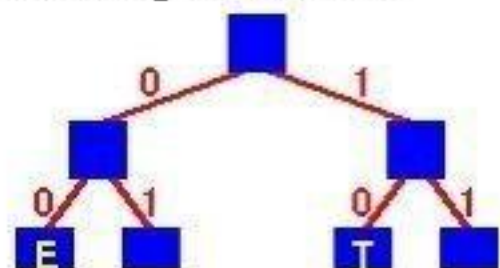
Greedy

Divide and conquer

**Made by: Waqar Siddhu**



Consider the following Huffman Tree



Answer ( Please select your correct option )

VuAnswers.com

10 00 010

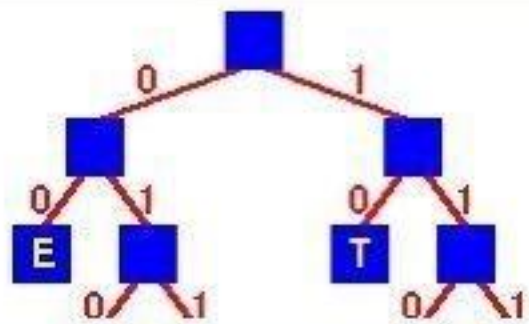
correct

011 00 010

10 00 110

11 10 110

Made by: Waqar Siddhu

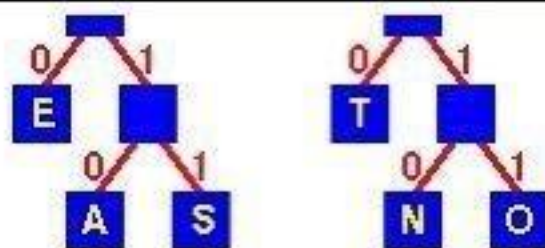


Answer ( Please select your correct option )

VuAnswers.com

 10 00 010correct 011 00 010 10 00 110 11 10 110

Made by: Waqar Siddhu



The binary code for the string "TEA" is

Answer ( Please select your correct option )

VuAnswers.com

10 00 010

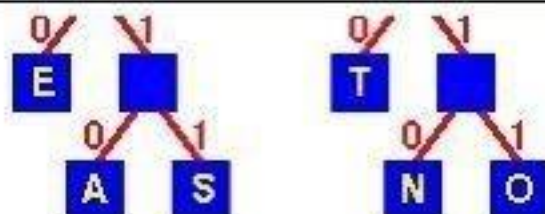
correct

011 00 010

10 00 110

11 10 110

Made by: Waqar Siddhu



The binary code for the string "TEA" is

Answer ( Please select your correct option )

VuAnswers.com

10 00 010

correct

011 00 010

10 00 110

11 10 110

Made by: Waqar Siddhu

What is generally true of Adjacency List and Adjacency Matrix representations of graphs?

Answer ( Please select your correct option )

VuAnswers.com

Lists require less space than *matrices* but take longer to find the weight of an edge  $(v_1, v_2)$

correct

Lists require less space than *matrices* and they are faster to find the weight of an edge  $(v_1, v_2)$

Lists require more space than *matrices* and they take longer to find the weight of an edge  $(v_1, v_2)$

Lists require more space than *matrices* but are faster to find the weight of an edge  $(v_1, v_2)$

Made by: Waqar Siddhu

If a graph has  $v$  vertices and  $e$  edges then to obtain a spanning tree we have to delete

Answer ( Please select your correct option )

VuAnswers.com

$v$  edges.

$v - e + 5$  edges

$v + e$  edges.

None of these

correct

Made by: Waqar Siddhu



The Huffman algorithm finds a (n) \_\_\_\_\_ solution.

Answer ( Please select your correct option )

VuAnswers.com

Optimal

correct

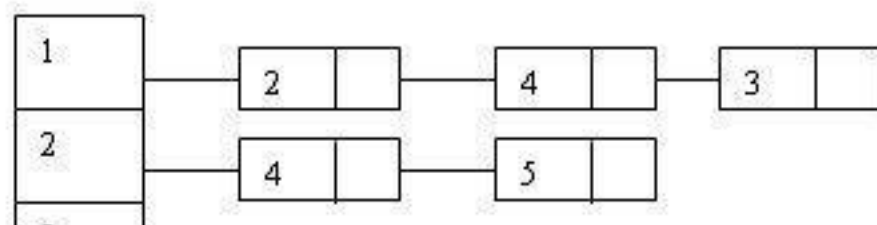
Non-optimal

Exponential

Polynomial

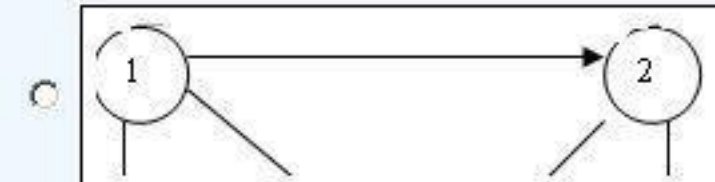
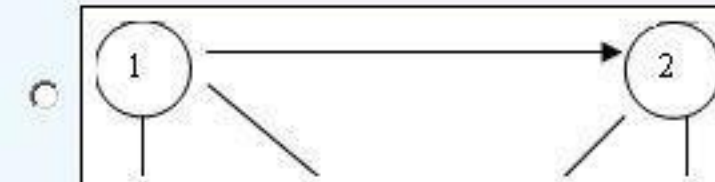
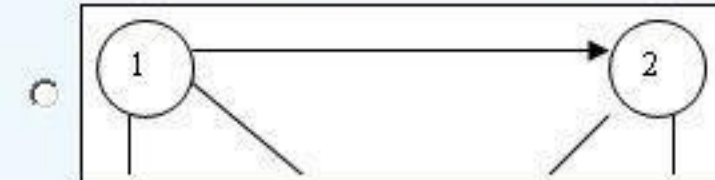
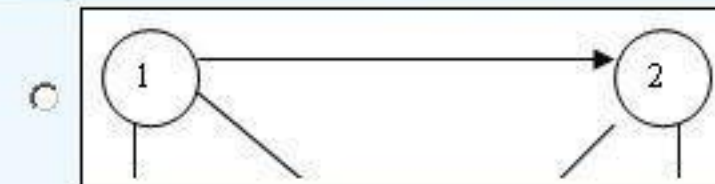
Made by: Waqar Siddhu

Consider the following adjacency list:



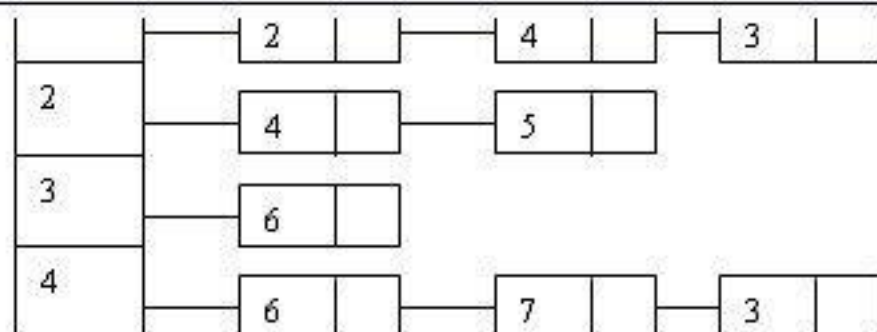
Answer ( Please select your correct option )

VuAnswers.com



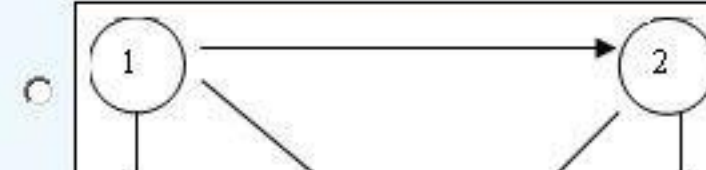
correct

Made by: Waqar Siddhu

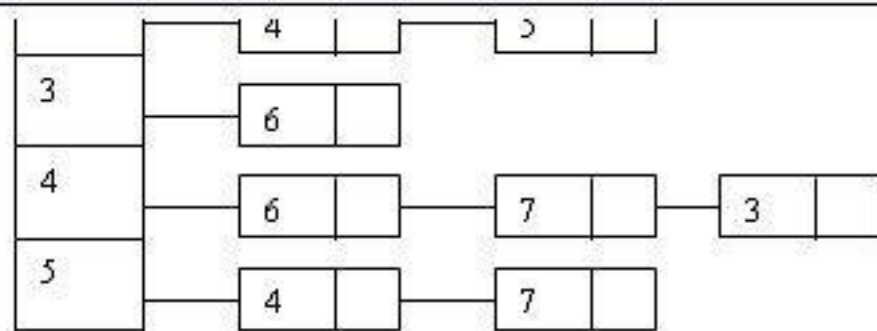


Answer ( Please select your correct option )

VuAnswers.com

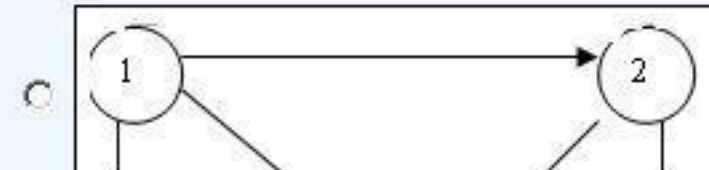


Made by: Waqar Siddhu

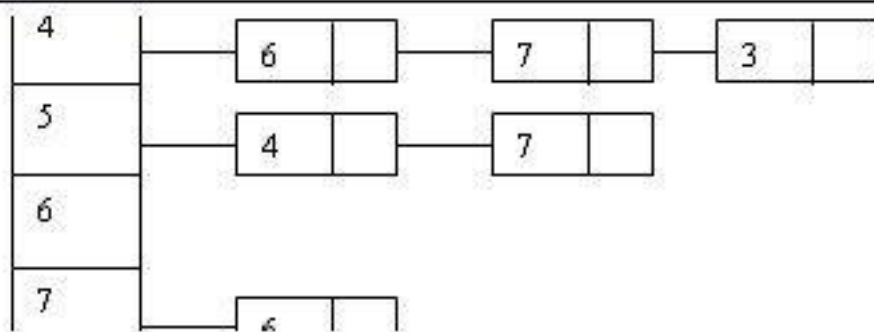


Answer ( Please select your correct option )

VuAnswers.com

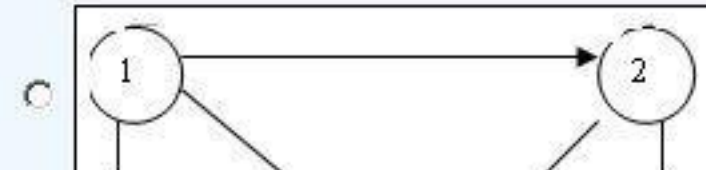


Made by: Waqar Siddhu

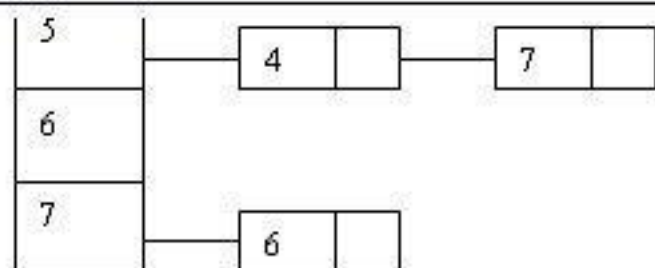


Answer ( Please select your correct option )

VuAnswers.com



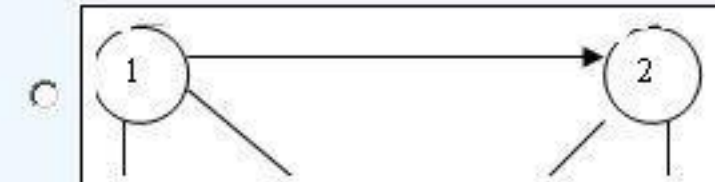
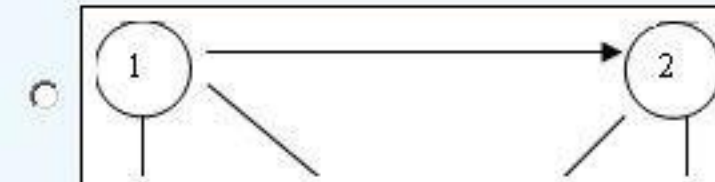
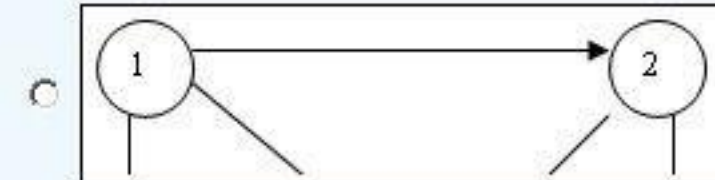
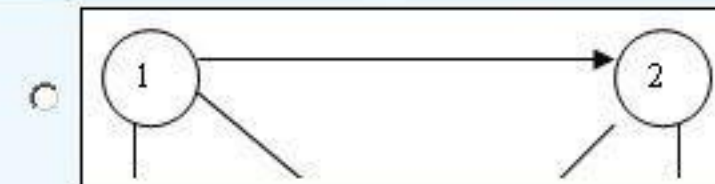
Made by: Waqar Siddhu



Which of the following graph(s) describe(s) the above adjacency list?

Answer ( Please select your correct option )

VuAnswers.com



Made by: Waqar Siddhu



\_\_\_\_\_ is a graphical representation of an algorithm

Answer ( Please select your correct option )

VuAnswers.com

$\Sigma$  notation

$\Theta$  notation

Flowchart

correct

Asymptotic notation

Made by: Waqar Siddhu

Identify the maximal points in given set, according to 2-D maxima (the points that are NOT dominated by other points).

$\{(2,5), (4,4), (4,11), (5,1), (7,7), (7,13), (9,10), (11,5), (12,12), (13,3), (14,10), (15,7)\}$

not sure

Answer ( Please select your correct option )

VuAnswers.com

$\{(7,13), (12,12), (14,10), (15,7)\}$

correct

$\{(7,7), (7,13), (9,10), (11,5), (14,10)\}$

$\{(2,5), (4,4), (4,11), (5,1), (14,10)\}$

$\{(4,4), (4,11), (7,13), (9,10), (14,10)\}$

Made by: Waqar Siddhu

What will be result of the following recurrence relation?

$$T(n) = \begin{cases} 4 & \text{if } n = 1 \\ T(n/5) + 3n^2 & \text{if } n \text{ is divisible by } 5 \end{cases}$$

Then  $T(5)$  is

Answer ( Please select your correct option )

VuAnswers.com

25

75

79

70

Made by: Waqar Siddhu

When we call heapify then at each level the comparison performed takes time

Answer ( Please select your correct option )

VuAnswers.com

It will take  $\Theta(1)$

correct

Time will vary according to the nature of input data

It can not be predicted

It will take  $\Theta(\log n)$

Made by: Waqar Siddhu

Who invented Quick sort procedure?

Answer ( Please select your correct option )

VuAnswers.com

Hoare

correct

Sedgewick

Mellroy

Coreman

Made by: Waqar Siddhu

The main shortcoming of counting sort is that it is useful for

The main shortcoming of counting sort is that it is useful for small integers.

71 page

Answer ( Please select your correct option )

VuAnswers.com

Small Integers

correct

Small characters

Floats

None of these

**Made by: Waqar Siddhu**



A product of matrices is \_\_\_\_\_ if it is either single matrix or the product of two matrix products, surrounded by parentheses.

not sure

VuAnswers.com

Answer ( Please select your correct option )

Fully parenthesized

correct

Partially parenthesized

Not parenthesized

None of the options

Made by: Waqar Siddhu

Maximum number of edges in a Directed Graph may be

Answer ( Please select your correct option )

VuAnswers.com

- $V$
- $2V$
- Approximately  $|V^2|$   
**correct**
- $\sqrt{V}$

Made by: Waqar Siddhu

If we encode and compress text using ASCII standard each character is represented by

Answer ( Please select your correct option )

VuAnswers.com

Fixed length codeword of 4 bits

Variable length codeword up to 4 bits

Variable length codeword up to 8 bits

Fixed length codeword of 8 bits.

correct

**Made by: Waqar Siddhu**

The Huffman Coding uses

101

Answer ( Please select your correct option )

VuAnswers.com

Prefix property that code words are not matched at ends

No prefix property it has its own method to store the codes

Prefix property that no code word is prefix of any other code

correct

Prefix property that no code words at same level of tree are prefix at other levels

**Made by: Waqar Siddhu**

In directed graphs the cardinality of edges  $|E| =$

Answer ( Please select your correct option )

VuAnswers.com

Sum of out-degrees of all the vertices

Sum of in-degrees of all the vertices

First both are true

**correct**

There is no relation between degree of vertices and no of edges

**Made by: Waqar Siddhu**

A Hamiltonian cycle is a cycle

Answer ( Please select your correct option )

VuAnswers.com

that visits every vertex in the graph exactly once

correct

that visits both vertex and edge exactly once

that visits all vertices without any constraint

that visits every edge in the graph exactly once

Made by: Waqar Siddhu



In generic graph traversal algorithm we

Answer ( Please select your correct option )

VuAnswers.com

put vertices in the bag data structure

put edges in the bag data structure

**correct**

put edges in stack data structure

put vertices in the stack data structure

**Made by: Waqar Siddhu**

In time stamp traversal we can calculate

Answer ( Please select your correct option )

VuAnswers.com

whether the graph has Cycles

correct

total number of cycles on the bases of forward edges

total number of cycles on the bases if back edges

total no of paths of certain length

Made by: Waqar Siddhu

Precedence constraint graph is

Answer ( Please select your correct option )

VuAnswers.com

non acyclic directed graph

acyclic undirected graph

non acyclic undirected graph

acyclic directed graph

correct

Made by: Waqar Siddhu

In Prim's algorithm, the additional information maintained by the algorithm is

not sure

Answer ( Please select your correct option )

VuAnswers.com

the length of the shortest path from vertex  $v$  to the vertex  $u$

correct

the length of the shortest edge from vertex  $v$  to points already in the tree

the dynamic programming rules

the information about all adjacent vertices

Made by: Waqar Siddhu

Bellman Ford algorithm is for the

Answer ( Please select your correct option )

VuAnswers.com

single source shortest path finding problem and does allow negative cycles

single source shortest path finding problem and does allow negative edges and negative cycles

multiple-source shortest path finding problem and does allow negative edges

correct

single source shortest path finding problem and does allow negative edges

Made by: Waqar Siddhu



Which of the following is not true about Dijkstra's algorithm?

Answer ( Please select your correct option )

VuAnswers.com

The length of the shortest path to the start vertex is always zero

It can find the shortest paths to all other vertices in the same worst case time that it needs to find the shortest path to a single vertex

**correct**

It will work on any weighted graph with positive weights

The running time of Bellman - Ford Algorithm is greater than Dijkstra's algorithm

**Made by: Waqar Siddhu**



Kruskal's Algorithm is used for

Answer ( Please select your correct option )

VuAnswers.com

calculating shortest path problem

calculating Minimum spanning tree

**correct**

shortest and Minimum Spanning tree both can be calculated by it

single source shortest path problems

**Made by: Waqar Siddhu**

Dijkstra's algorithm is used for

Answer ( Please select your correct option )

VuAnswers.com

- calculating multiple source shortest path problems
- calculating Minimum spanning tree
- shortest and Minimum Spanning tree both can be calculated by it
- single source shortest path problems

correct

**Made by: Waqar Siddhu**

Kruskal's Algorithm has time complexity

Answer ( Please select your correct option )

VuAnswers.com

overall  $\mathcal{O}(E \log E)$  and for sparse graph  $\mathcal{O}(E \log V)$

correct

overall  $\mathcal{O}(EV)$  and for sparse graph  $\mathcal{O}(V^2)$

overall  $\mathcal{O}(V \log E)$

overall  $\mathcal{O}(E \log V)$  for sparse graph  $\mathcal{O}(V \log E)$

Made by: Waqar Siddhu

Bellman Ford algorithm applies relaxation to every

Answer ( Please select your correct option )

VuAnswers.com

edge of the graph and repeats exactly  $E-1$  times

edge but use the back edges for the completion

edge of the graph and repeats exactly  $v-1$  times

correct

vertex of the graph and repeats exactly  $E-1$  times

Made by: Waqar Siddhu

Complexity wise the comparison based merge and quick sort algorithms fall in

Answer ( Please select your correct option )

VuAnswers.com

- Deterministic Polynomial class
- Non-Deterministic Polynomial class
- Quick sort in P class and Merge sort in NP class
- Quick sort in NP class and Merge sort in P class

Made by: Waqar Siddhu

In NP-problems "NP" represents

Answer ( Please select your correct option )

VuAnswers.com

Non-deterministic Polynomials

correct

Null-polynomials

Negative Polynomials

Non-polynomials

Made by: Waqar Siddhu



Floyd-Warshall algorithm dates back to the early \_\_\_\_\_.

Answer ( Please select your correct option )

VuAnswers.com

70's

90's

60's

50's

correct

Made by: Waqar Siddhu

Space used by Floyd-Warshall algorithm is

the running time is  $\Theta(n^3)$ . The space used by the algorithm is  $\Theta(n^2)$ .

Answer ( Please select your correct option )

VuAnswers.com

$\Theta(n^4)$

$\Theta(n^3)$

$\Theta(n^2)$

correct

$\Theta(2^n)$

Made by: Waqar Siddhu

In the clique cover problem, for two vertices to be in the same group, they must be \_\_\_\_\_ each other.

176

Answer ( Please select your correct option )

VuAnswers.com

Apart from

Far from

Near to

Adjacent to

correct

**Made by: Waqar Siddhu**

Polynomial time certificates

naippta

VuAnswers.com

Answer ( Please select your correct option )

indicate there are polynomial solutions for NP -class problems

are the tools to solve the problems in P class in P time

use in reductions to verify for the NP-problems classes

use in Polynomial classes to interchange the problems

**Made by: Waqar Siddhu**

What is the solution to the recurrence  $T(n) = T(n/2) + n$ ?

Answer ( Please select your correct option )

VuAnswers.com

$O(\log n)$

$O(n)$

correct

$O(n \log n)$

$O(n^2)$

Made by: Waqar Siddhu

If a pseudo code is memory wise efficient then

Answer ( Please select your correct option )

VuAnswers.com

Obviously it will be time wise efficient as well.

Memory wise efficient codes cannot be time wise efficient

Time wise efficient code can be memory wise efficient but wise versa is not true.

It may be memory wise efficient but not necessary

correct

**Made by: Waqar Siddhu**



Merge sort makes two recursive calls. Which statement is true after these recursive calls finish, but before the merge step?

Answer ( Please select your correct option )

VuAnswers.com

The array elements form a heap

Elements in each half of the array are sorted amongst themselves

correct

Elements in the first half of the array are less than or equal to elements in the second half of the array

None of the given options

Made by: Waqar Siddhu

Search techniques of various algorithms look at \_\_\_\_\_

Answer ( Please select your correct option )

VuAnswers.com

Many possible solutions

correct

Maximum 2 possible solutions

Minimum 2 possible solutions

Sorting solutions

Made by: Waqar Siddhu

Using ASCII standard each character is represented by a fixed length codeword of \_\_\_\_\_

Answer ( Please select your correct option )

VuAnswers.com

9 bits

16 bits

8 bits

correct

32 bits

Made by: Waqar Siddhu

The Huffman encoding algorithm is a \_\_\_\_\_

Answer ( Please select your correct option )

VuAnswers.com

Dynamic and greedy algorithm

Divide and conquer and greedy algorithm

Geedy algorithm.

correct

Dynamic programming algorithm

Made by: Waqar Siddhu

Breadth first search is shortest path algorithm that works

Answer ( Please select your correct option )

VuAnswers.com

on un-weighted graphs

correct

on weighted graphs

on both weighted and un-weighted graphs

BFS cannot be used for shortest path problems

Made by: Waqar Siddhu

Suppose that a graph  $G = (V, E)$  is implemented using adjacency lists. What is the complexity of a breadth-first traversal of  $G$ ?

Answer ( Please select your correct option )

VuAnswers.com

$O(|V|^2)$

$O(|V| + |E|)$

$O(|V|^2|E|)$

$O(|V| + |E|)$

Made by: Waqar Siddhu



Non-optimal or greedy algorithm for money change takes \_\_\_\_\_

Answer ( Please select your correct option )

VuAnswers.com

$O(kN)$

$O(2^k)$

$O(N)$

$O(k)$

p 99

Made by: Waqar Siddhu

The Huffman algorithm finds a (n) \_\_\_\_\_ solution.

Answer ( Please select your correct option )

VuAnswers.com

Optimal

Non-optimal

Exponential

Polynomial

Made by: Waqar Siddhu

Using ASCII standard the string "abacdaacac" will be encoded with \_\_\_\_\_ bits.

Answer (Please select your correct option )

VuAnswers.com

80

160

320

100

Made by: Waqar Siddhu

Consider the string "abacdaacac" if the string is coded with ASCII codes using Huffman encoding scheme, the message length would be

Answer ( Please select your correct option )

VuAnswers.com

8 bits

80 bits

Less than 50 bits

More than 50 bits

Made by: Waqar Siddhu

Random access machine or RAM is a/an

Answer ( Please select your correct option )

VuAnswers.com

Machine build by Al-Khwarizmi

Mechanical machine

Electronics machine

Mathematical model

p 10

Made by: Waqar Siddhu

In order to say anything meaningful about our algorithms, it will be important for us to settle on a \_\_\_\_\_.

Answer ( Please select your correct option )

VuAnswers.com

C++ program

Java program

Pseudo program

Mathematical model of computation

p 10

Made by: Waqar Siddhu



Divide-and-conquer involves breaking the problem into a small number of

Answer ( Please select your correct option )

VuAnswers.com

Sub problems

p 34

Selection

pivot

Sieve

Made by: Waqar Siddhu

Quick sort procedure was invented by

Answer ( Please select your correct option )

VuAnswers.com

Hoare

Sedgewick

Mellroy

Coreman

Made by: Waqar Siddhu

In Bucket sort, if there are duplicates then each bin can be replaced by a

Answer ( Please select your correct option )

VuAnswers.com

Linked list

p 69

Heap

Hash table

Stack

Made by: Waqar Siddhu

In in-place sorting algorithm is one that uses no \_\_\_\_\_ arrays for storage.

Answer ( Please select your correct option )

VuAnswers.com

two dimensional

three dimensional

n dimensional

additional

Made by: Waqar Siddhu

A  $p \times q$  matrix A can be multiplied with a  $q \times r$  matrix B. The result will be a  $p \times r$  matrix C. In particular, for  $1 \leq i \leq p$  and  $1 \leq j \leq r$ ,

Answer ( Please select your correct option )

VuAnswers.com

$C[i, j] = \sum_{k=1}^q A[i, k]B[k, j]$  p 84

$C[i, j] = \sum_{k=1}^q A[k, i]B[k, j]$

$C[i, j] = \sum_{k=1}^q A[k, i]B[j, k]$

None of these

Made by: Waqar Siddhu

For a given chain of matrices  $A_1, A_2, A_3, A_4$ , the product  $A_1 A_2 A_3 A_4$  can be fully parenthesized in \_\_\_\_\_ distinct way(s).

Answer ( Please select your correct option )

VuAnswers.com

Five

Four

Three

Two

Made by: Waqar Siddhu



Worst case running time of Quick Sort algorithm for an array with n elements is?

Answer ( Please select your correct option )

VuAnswers.com

$n^2$

p 49

$n^{\frac{n}{2}}$

$n$

$n^8$

Made by: Waqar Siddhu

If we encode and compress text using ASCII standard each character is represented by

Answer ( Please select your correct option )

VuAnswers.com

Fixed length codeword of 4 bits

Variable length codeword up to 4 bits

Variable length codeword up to 8 bits

Fixed length codeword of 8 bits.

p 99

Made by: Waqar Siddhu

The Huffman algorithm finds

Answer ( Please select your correct option )

VuAnswers.com

sometime optimal some time non optimal solution

space wise optimal and time wise non optimal solution

a non-optimal solution

an optimal solution

Made by: Waqar Siddhu

The Huffman algorithm time complexity

Answer ( Please select your correct option )

VuAnswers.com

Can be improved up to  $O(n \log n)$

Can be improved up to  $O(\sqrt{n} \log n)$

Is always  $O(n^3)$

Is always  $O(n^2)$

Made by: Waqar Siddhu

Using ASCII standard the string "abacdaac"

Answer ( Please select your correct option )

VuAnswers.com

If we use variable code for ASCII it will be 32 bits

If we use fixed code for ASCII it will be 256 bits

If we use variable code for ASCII it will be will 64 bits

If we use fixed code for ASCII it will be 64 bits

Made by: Waqar Siddhu

Using Huffman encoding technique the string "abc" will take .....

Answer ( Please select your correct option )

VuAnswers.com

5 bits

6 bits

24 bits

12 bits

Made by: Waqar Siddhu



Using Huffman encoding technique the string "a@\$a" will be encoded with \_\_\_\_\_ bits

Answer ( Please select your correct option )

VuAnswers.com

5

6

8

Huffman encoding fail at this string

Made by: Waqar Siddhu

In fractional knapsack we sort the

Answer ( Please select your correct option )

VuAnswers.com

Value per unit weight in increasing order

Weight per unit value in increasing order

Value per unit weight in decreasing order

Weight per unit value in decreasing order

Made by: Waqar Siddhu

In generic graph traversal algorithm we

Answer ( Please select your correct option )

VuAnswers.com

put vertices in the bag data structure

put edges in the bag data structure

put edges in stack data structure

put vertices in the stack data structure

Made by: Waqar Siddhu

In time stamp traversal we can calculate

Answer ( Please select your correct option )

VuAnswers.com

whether the graph has Cycles

total number of cycles on the bases of forward edges

total number of cycles on the bases if back edges

total no of paths of certain length

Made by: Waqar Siddhu

when the graph has relatively few edges

Answer ( Please select your correct option )

VuAnswers.com

Prim's algorithm is better than Kruskal's

Kruskal's algorithm is better than Prim's

No one has priority over each other

the assumption few edges is not valid

Made by: Waqar Siddhu

Kruskal's algorithm

Answer ( Please select your correct option )

VuAnswers.com

Choose the best tree edge

Choose the vertex that gives the lightest weight

Follow the dynamic programming rules for choosing edges

Choose the best non-cycle edge

Made by: Waqar Siddhu



In Prim's algorithm we use

Answer ( Please select your correct option )

VuAnswers.com

Queue data structure

Priority Queue data structure

Stack data structure

Both stack and Queue data structures

**Made by: Waqar Siddhu**

Adding any edge to a free tree

Answer ( Please select your correct option )

VuAnswers.com

keeps it the free tree and increases the size of the tree

creates a unique cycle

it is not allowed to add the edge in free tree

creates multiple cycles

Made by: Waqar Siddhu

An un-weighted graph can be considered as a graph in which every edge has

Answer ( Please select your correct option )

VuAnswers.com

no weight assigned to it

by default weight of one unit

p 153

its own different keys of weights

there are no such type of graphs in theory

Made by: Waqar Siddhu

Kruskal's Algorithm is used for

Answer ( Please select your correct option )

VuAnswers.com

calculating shortest path problem

calculating Minimum spanning tree

shortest and Minimum Spanning tree both can be calculated by it

single source shortest path problems

Made by: Waqar Siddhu

Kruskal's Algorithm has time complexity

Answer (Please select your correct option )

VuAnswers.com

overall  $\mathcal{O}(E \log E)$  and for sparse graph  $\mathcal{O}(E \log V)$

overall  $\mathcal{O}(EV)$  and for sparse graph  $\mathcal{O}(V^2)$

overall  $\mathcal{O}(V \log E)$

overall  $\mathcal{O}(E \log V)$  for sparse graph  $\mathcal{O}(V \log E)$

Made by: Waqar Siddhu

Bellman Ford algorithm applies relaxation to every

Answer ( Please select your correct option )

VuAnswers.com

- edge of the graph and repeats exactly  $E-1$  times
- edge but use the back edges for the completion
- edge of the graph and repeats exactly  $v-1$  times
- vertex of the graph and repeats exactly  $E-1$  times

Made by: Waqar Siddhu



All algorithms having the time complexity  $O(n^{10})$  and  $O(n^{100})$  fall

Answer ( Please select your correct option )

VuAnswers.com

Non-Deterministic Polynomial class

Deterministic Polynomial class

$O(n^{10})$  in P class and  $O(n^{100})$  in NP class

$O(n^{10})$  in NP class and  $O(n^{100})$  in P class

Made by: Waqar Siddhu

In NP-problems "NP" represents

Answer ( Please select your correct option )

VuAnswers.com

Non-deterministic Polynomials

Null-polynomials

Negative Polynomials

Non-polynomials

Made by: Waqar Siddhu

Space used by Floyd-Warshall algorithm is

Answer ( Please select your correct option )

VuAnswers.com

$\Theta(n^4)$

$\Theta(n^3)$

$\Theta(n^2)$

p 164

$\Theta(2^n)$

Made by: Waqar Siddhu

If a problem is NP-complete

Answer ( Please select your correct option )

VuAnswers.com

there is no relation between NP and NP-complete

it can be solved in P time

it must be in P

it must also be in NP

Made by: Waqar Siddhu

If a problem "S" is NP- complete it must be

Answer ( Please select your correct option )

VuAnswers.com

NP and NP-hard

NP not necessarily NP-Hard

NP-hard means it is NP complete as well

in P and NP

Made by: Waqar Siddhu

In the 3-coloring problem, for two vertices to be in the same group, they must be not \_\_\_\_\_ to each other.

Answer ( Please select your correct option )

VuAnswers.com

Apart from

Far from

Near to

Adjacent to

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Algorithm's essential elements are

Answer ( Please select your correct option )

VuAnswers.com

Step wise solution.

Stepwise solution and finite time

Step wise solution finite inputs

Stepwise approach in which time and memory does not matter.

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Search techniques of various algorithms look at \_\_\_\_\_

Answer ( Please select your correct option )

VuAnswers.com

Many possible solutions

Maximum 2 possible solutions

Minimum 2 possible solutions

Sorting solutions

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Which traversal technique is look like propagating wave-front outward

Answer ( Please select your correct option )

VuAnswers.com

Generic Traversal

Breadth First Traversal

p 117

Depth First Traversal

Time Stamp Traversal

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