

Virtual University PLHR55

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WhatsApp Group Link

<https://chat.whatsapp.com/DDbUe21PMS3FSaBjUABrx5>

#StudyUpdates #StayInformed

Regards,

Team PLHR55

Question No : 1 of 52 Marks: 1 (Budgeted Time 1 Min)

The Huffman algorithm finds a (n) _____ solution.

Answer (Please select your correct option)

- Optimal
- Non-optimal
- Exponential
- Polynomial

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Question No : 2 of 52 Marks: 1 (Budgeted Time 1 Min)

Using ASCII standard the string "abacdaaac" will be encoded with _____ bits.

Answer (Please select your correct option)

- 80
- 160
- 320
- 100

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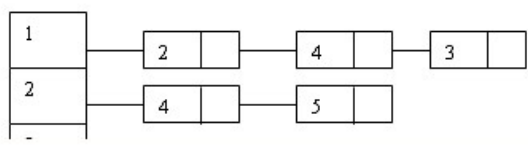
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MADE BY WAQAR SIDDHU

Question No : 3 of 52 Marks: 1 (Budgeted Time 1 Min)

Consider the following adjacency list:



Answer (Please select your correct option)

-
-
-
-

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Question No : 4 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- 8 bits
- 80 bits
- Less than 50 bits
- More than 50 bits

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MADE BY WAQAR SIDDHU

Question No : 5 of 52 Marks: 1 (Budgeted Time 1 Min)

Al-Khwarizmi's work was written in a book titled _____

Answer (Please select your correct option)

- al Kitab al-mukhatasar fi hisab al-jabrwa'l-muqabalah
- Calculation by Completion
- al Kitab
- al-jabrwa'l-muqabalah

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MADE BY WAQAR SIDDHU

Question No : 6 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- (log n) order
- increasing order only
- decreasing order only
- heap order

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MADE BY WAQAR SIDDHU

Question No : 7 of 52 Marks: 1 (Budgeted Time 1 Min)

The running time of quick sort depends heavily on the selection of

Answer (Please select your correct option)

- Required Output
- Input and output
- Pivot
- Input data only

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MADE BY WAQAR SIDDHU

Question No : 8 of 52 Marks: 1 (Budgeted Time 1 Min)

If a sorting algorithm solely based on comparisons of keys in the array then it is impossible to sort more efficiently than

Answer (Please select your correct option)

- $\Omega (n \lg n)$
- $\Theta (n \lg n)$
- $O (n \lg n)$
- None of these

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Question No : 9 of 52 Marks: 1 (Budgeted Time 1 Min)

Fibonacci sequence was posed by

Answer (Please select your correct option)

- Leonardo Pisano
- Leonardo Picasso
- Leonardo Lewinski
- Karl Marx

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MADE BY WAQAR SIDDHU

Question No : 10 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- $\Phi = 1.618$
- $\Phi = 3.142$
- $\Phi = 1.816$
- $\Phi = 1.168$

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MADE BY WAQAR SIDDHU

Question No : 11 of 52 Marks: 1 (Budgeted Time 1 Min)

For a given chain of matrices A1, A2, A3, A4, the product A1 A2 A3 A4 can be fully parenthesized in _____ distinct way(s).

Answer (Please select your correct option)

- Five
- Four
- Three
- Two

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MADE BY WAQAR SIDDHU

Question No : 12 of 52 Marks: 1 (Budgeted Time 1 Min)

Maximum number of edges in a Directed Graph may be

Answer (Please select your correct option)

- V
- 2V
- Approximatly $|V^2|$
- $v/2$

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MADE BY WAQAR SIDDHU

Question No : 13 of 52 Marks: 1 (Budgeted Time 1 Min)

The worst case running time of the algorithm given below is,

```
MAXIMA(int n, Point P[1...n])  
1 for i ← 1 to n n times  
2 do maximal ← true  
3   for j ← 1 to n n times
```

Answer (Please select your correct option)

- $\Theta(n^6)$
- $\Theta\left(\frac{2n}{n^6}\right)$
- $\Theta(n^2)$
- $\Theta(2n \lg 6)$

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Question No : 14 of 52 Marks: 1 (Budgeted Time 1 Min)

The Huffman algorithm finds

Answer (Please select your correct option)

- sometime optimal some time non optimal solution
- space wise optimal and time wise non optimal solution
- a non-optimal solution
- an optimal solution

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MADE BY WAQAR SIDDHU

Question No : 15 of 52 Marks: 1 (Budgeted Time 1 Min)

The Huffman algorithm time complexity

Answer (Please select your correct option)

- 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 $O(n^2)$

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MADE BY WAQAR SIDDHU

Question No : 16 of 52 Marks: 1 (Budgeted Time 1 Min)

Using ASCII standard the string "abacdaaca" will be encoded with

Answer (Please select your correct option)

- 216 bits
- 72 bits
- 144 bits
- 36 bits

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MADE BY WAQAR SIDDHU

Question No : 17 of 52 Marks: 1 (Budgeted Time 1 Min)

Using ASCII standard the string "abacdaac"

Answer (Please select your correct option)

- 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

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MADE BY WAQAR SIDDHU

Question No : 18 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- 5
- 6
- 8
- Huffman encoding fail at this string

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MADE BY WAQAR SIDDHU

Question No : 19 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- that no codeword is the prefix of any other
- 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

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Question No : 20 of 52 Marks: 1 (Budgeted Time 1 Min)

In generic graph traversal algorithm we

Answer (Please select your correct option)

- 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

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Question No : 21 of 52 Marks: 1 (Budgeted Time 1 Min)

In undirected graphs there

Answer (Please select your correct option)

- are no Cross edges but have forward and back edges
- are only forward edges
- is convention of only back edges
- is convention of forward edges

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MADE BY WAQAR SIDDHU

Question No : 22 of 52 Marks: 1 (Budgeted Time 1 Min)

Precedence constraint graph is

Answer (Please select your correct option)

- non acyclic directed graph
- acyclic undirected graph
- non acyclic undirected graph
- acyclic directed graph

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Question No : 23 of 52 Marks: 1 (Budgeted Time 1 Min)

when the graph has relatively few edges

Answer (Please select your correct option)

- Kruskal's algorithm is better than Prim's
- No one has priority over each other
- the assumption few edges is not valid
- Prim's algorithm is better than Kruskal's

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Question No : 24 of 52 Marks: 1 (Budgeted Time 1 Min)

A free tree with "n" vertices has

Answer (Please select your correct option)

- exactly $n+1$ edges
- exactly $n-1$ edges
- exactly $2n+1$ edges
- exactly $2n-1$ edges

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Question No : 25 of 52 Marks: 1 (Budgeted Time 1 Min)

G^T for the digraph can be computed in

Answer (Please select your correct option)

- \emptyset (VE)
- \emptyset (V log E)
- \emptyset (E log V)
- \emptyset (V+E)

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Question No : 26 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- 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
- It will work on any weighted graph with positive weights
- The running time of Bellman - Ford Algorithm is greater than Dijkstra's algorithm

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Question No : 27 of 52 Marks: 1 (Budgeted Time 1 Min)

The running time of the Dijkstra's algorithm is _____

Answer (Please select your correct option)

- $\Theta(E \log V)$
- $\Theta(E)$
- $\Theta(\log V)$
- $\Theta(EV^2)$

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MADE BY WAQAR SIDDHU

Question No : 28 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- 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

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Question No : 29 of 52 Marks: 1 (Budgeted Time 1 Min)

Floyd-Warshall algorithm dates back to the early _____.

Answer (Please select your correct option)

- 70's
- 90's
- 60's
- 50's

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Question No : 30 of 52 Marks: 1 (Budgeted Time 1 Min)

Running time of Floyd-Warshall algorithm is

Answer (Please select your correct option)

- $\Theta(n^2)$
- $\Theta(n^4)$
- $\Theta(n^3)$
- $\Theta(3^n)$

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Question No : 31 of 52 Marks: 1 (Budgeted Time 1 Min)

The function having complexity $O(n^2)$ belongs to

Answer (Please select your correct option)

- NP-Class
- Co-Prime Class
- P-Class
- Both P and NP Classes

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Question No : 32 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- Co-NP Class
- NP-prime class
- P-Class
- NP -Class

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Question No : 33 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

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

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Question No : 34 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- NP and NP-hard
- NP not necessarily NP-Hard
- NP-hard means it is NP complete as well
- in P and NP

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Question No : 35 of 52 Marks: 1 (Budgeted Time 1 Min)

Clique cover problem arises in applications of _____.

Answer (Please select your correct option)

- Map drawing
- Clustering
- Architectural design
- Clique

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Question No : 36 of 52 Marks: 1 (Budgeted Time 1 Min)

Sieve Technique can be applied to solve _____

Answer (Please select your correct option)

- Selection problems
- Arguement problems
- Dynamic problems
- Greedy problems

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Question No : 37 of 52 Marks: 1 (Budgeted Time 1 Min)

Which type of instructions Random Access Machine (RAM) can execute? Choose best answer

Answer (Please select your correct option)

- Algebraic and logic
- Geometric and arithmetic
- Arithmetic and logic
- Parallel and recursive

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Question No : 38 of 52 Marks: 1 (Budgeted Time 1 Min)

The Huffman encoding algorithm is a _____

Answer (Please select your correct option)

- Dynamic and greedy algorithm
- Divide and conquer and greedy algorithm
- Geedy algorithm.
- Dynamic programming algorithm

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Question No : 39 of 52 Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- Dynamic programming
- Brute Force
- Greedy
- Divide and conquer

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Question No : 40 of 52 Marks: 1 (Budgeted Time 1 Min)

Which traversal technique is look like propagating wave-front outward

Answer (Please select your correct option)

- Generic Traversal
- Breadth First Traversal
- Depth First Traversal
- Time Stamp Traversal

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Question No : 41 of 52 Marks: 2 (Budgeted Time 4 Min)

Answer yes or no and give a brief explanation for your choice.
Every problem in NP is NP-complete

Answer (Please [click here](#) to Add Answer)

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Question No : 42 of 52 Marks: 2 (Budgeted Time 4 Min)

Consider the case of 3 matrices: A1 is 5×4 , A2 is 4×6 and A3 is 6×2 . If the multiplication can be carried out this way $((A1A2) A3)$ then find out the cost.

Answer ([Please click here to Add Answer](#))

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Question No : 43 of 52 Marks: 2 (Budgeted Time 4 Min)

If we implement the bag data structure by using a stack, then which type of traversal it will be?

Answer ([Please click here to Add Answer](#))

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Question No : 44 of 52 Marks: 2 (Budgeted Time 4 Min)

What is the greedy thing to do in Dijkstra's algorithm?

Answer ([Please click here to Add Answer](#))

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MADE BY WAQAR SIDDHU

Question No : 45 of 52 Marks: 3 (Budgeted Time 6 Min)

How the Kruskal's algorithm works?

Answer ([Please click here to Add Answer](#))

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Question No : 46 of 52 Marks: 3 (Budgeted Time 6 Min)

Suppose you are given an integer array and asked to find the median in that array, suggest two techniques, one having the complexity $O(n \log n)$ and the other having linear time i.e. $O(n)$.

Answer ([Please click here to Add Answer](#))

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Question No : 47 of 52 Marks: 3 (Budgeted Time 6 Min)

Let A is the adjacency matrix of an undirected graph given below.
Does this matrix represent a complete graph?
What general property of the matrix indicates that the graph is complete?

| | a | b | c | d | e | f |
|---|---|---|---|---|---|---|
| a | 1 | 1 | 1 | 0 | 1 | 0 |
| b | 1 | 0 | 0 | 1 | 0 | 0 |

Answer ([Please click here to Add Answer](#))

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Question No : 48 of 52 Marks: 3 (Budgeted Time 6 Min)

What do you mean by polynomial time algorithm? Explain what kind of problem can be solved by using polynomial time algorithm?

Answer ([Please click here to Add Answer](#))

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Question No : 49 of 52 Marks: 5 (Budgeted Time 10 Min)

Suppose you could reduce an NP-complete problem to a polynomial time problem in polynomial time. What would be the consequence?

Answer ([Please click here to Add Answer](#))

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Question No : 50 of 52 Marks: 5 (Budgeted Time 10 Min)

Develop the time analysis series of the following pseudo code and then give the asymptotic notation of your developed time sequence .

```
for (i=1; i<=n; i=i*7)
{
    for (j=1; j<=7n; ++j)
    {
        for(k=n; k>1; k=k-5)
        {
```

Answer ([Please click here to Add Answer](#))

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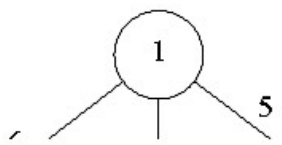
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Question No : 51 of 52 Marks: 5 (Budgeted Time 10 Min)

Apply Prim's algorithms on the following graph. [You can show final result in exam software and need not to show all intermediate steps].



Answer (Please [click here](#) to Add Answer)

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Question No : 52 of 52 Marks: 5 (Budgeted Time 10 Min)

Write the pseudo code for Depth-first Search algorithm in Graphs with recursive version.

Answer ([Please click here to Add Answer](#))

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Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)

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

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

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Answer (Please select your correct option)

VuAnswers.com

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

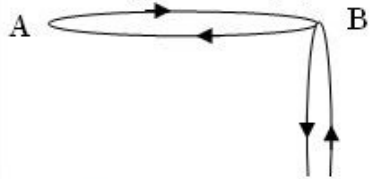
correct

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Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)

The total degrees of the graph is



Answer (Please select your correct option)

VuAnswers.com

3

5

6

9

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Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

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3

5

6

9

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Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

VuAnswers.com

3



5



6



9



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Non-optimal or greedy algorithm for money change takes _____

Answer (Please select your correct option)

VuAnswers.com

$O(k)$

correct

$O(2^k)$

$O(N)$

$O(kN)$

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The Huffman algorithm finds a (n) _____ solution.

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Answer (Please select your correct option)

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Optimal correct

Non-optimal

Exponential

Polynomial

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Which formula is used for calculating worst case running time?

Answer (Please select your correct option)

VuAnswers.com

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

correct

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

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

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

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

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Answer (Please select your correct option)

VuAnswers.com

divide-and-conquer

correct

decrease and conquer

greedy nature

2-dimension Maxima

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

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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)

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Overlapping

correct

Over costing

Optimized

None of these

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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)

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Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

Maximum number of edges in a Directed Graph may be

Answer (Please select your correct option)

VuAnswers.com

V

2V

Approximately $|V|^2$

correct

$\sqrt{2}$

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
- Is square in shape for directed graphs but not for undirected graphs
- Is always diagonal matrix

correct

Made by: Waqar Siddhu

Question No : 17 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Question No : 18 of 52

Marks: 1 (Budgeted Time 1 Min)

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
- 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

correct

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

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

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

Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

In Prim's algorithm we use

Answer (Please select your correct option)

VuAnswers.com

Queue data structure

Priority Queue data structure

correct

Stack data structure

Both stack and Queue data structures

Made by: Waqar Siddhu

Adding any edge to a free tree

142

Answer (Please select your correct option)

VuAnswers.com

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

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

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

Question No : 29 of 52

Marks: 1 (Budgeted Time 1 Min)

Bellman Ford algorithm applies relaxation to every

160

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

Question No : 30 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

VuAnswers.com

$\Theta(n^2)$

$\Theta(n^4)$

$\Theta(n^3)$

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

Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

VuAnswers.com

- P
- NPC
- Co-NP
- P and NP

correct

Made by: Waqar Siddhu

Clique cover problem arises in applications of _____.

176

VuAnswers.com

Answer (Please select your correct option)

Map drawing

Clustering

correct

Architectural design

Clique

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

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman encoding algorithm is a _____

99

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

153

Answer (Please select your correct option)

VuAnswers.com

on un-weighted graphs

correct

on weighted graphs

on both weighted and un-weighted graphs

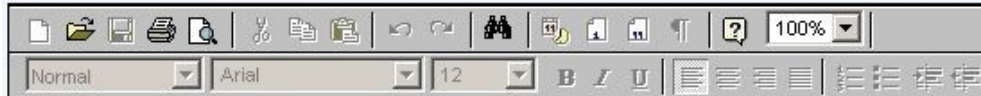
BFS cannot be used for shortest path problems

Made by: Waqar Siddhu

What are the essential elements of an algorithm?

Answer ([Please click here to Add Answer](#))

VuAnswers.com

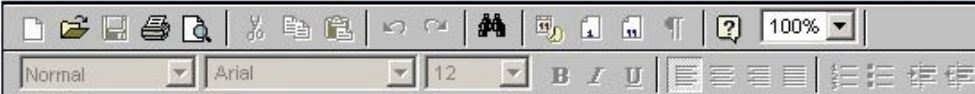


Made by: Waqar Siddhu

What is overall time for Kruskal's algorithm if the graph is sparse?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

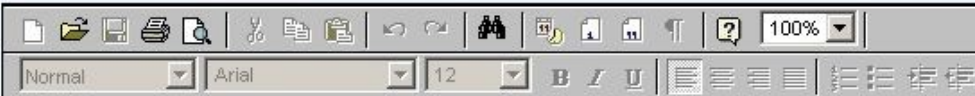
Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

What is DFS and how does it work?

Answer ([Please click here to Add Answer](#))

VuAnswers.com

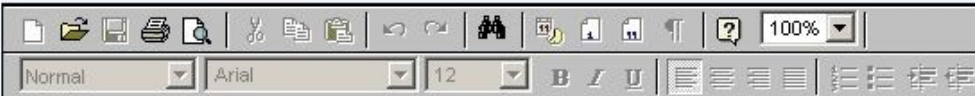


Made by: Waqar Siddhu

What is Bellman-Ford algorithm's running time?

VuAnswers.com

Answer ([Please click here to Add Answer](#))



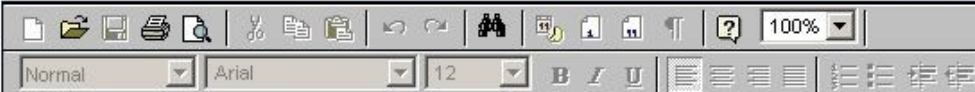
Made by: Waqar Siddhu

Explain the following two basic cases according to Floyd-Warshall Algorithm,

1. Don't go through vertex k at all.
2. Do go through vertex k.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

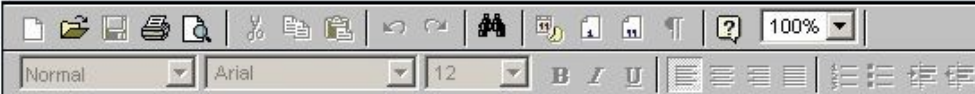
Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

Describe 2-d maxima problem in mathematical or algorithmic form.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Describe Minimum Spanning Trees Problem with examples.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Let the adjacency list representation of an undirected graph is given below:

Is there any isolated vertex? If yes, Name the vertex.

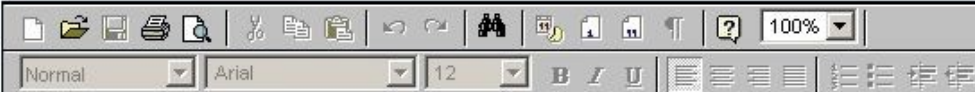
What general property of the list indicates that the graph has an isolated vertex?

a → b → c → e

b → a → d

Answer ([Please click here to Add Answer](#))

VuAnswers.com

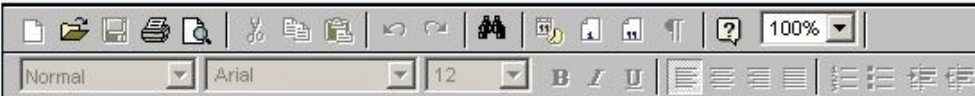


Made by: Waqar Siddhu

a → b → c → e
b → a → d
c → a → d → e → f
d → b → c → f
e → a → c → f

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

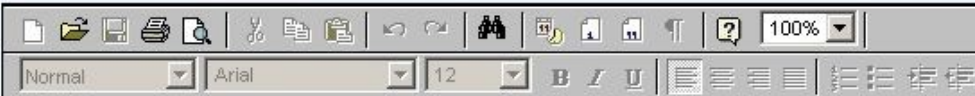
Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

b → a → d
c → a → d → e → f
d → b → c → f
e → a → c → f
f → c → d → e
g

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

c → a → d → e → f
d → b → c → f
e → a → c → f
f → c → d → e
g

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

You are given the task of laying down new railway lines which will connect all n cities. Thus for any pair of cities, you will end up with track connecting them. Note that two routes may share the same track; track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Agorithm

Answer ([Please click here to Add Answer](#))

VuAnswers.com



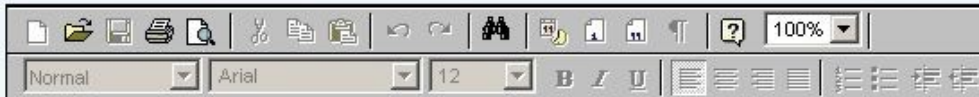
Made by: Waqar Siddhu

Several given the most satisfying connection between cities. Each track has a cost and a direction. There are two parts of track, you can build up from each connecting with a new station. There are two tracks; track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Algorithm
- 4 Bellman Ford Algorithm.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



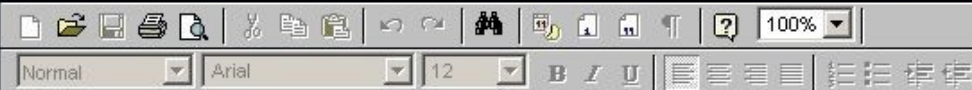
Made by: Waqar Siddhu

Show the result of time stamped DFS algorithm on the following graph. Take node E as a starting node. [You can show final result in exam software and need not to show all intermediate steps].

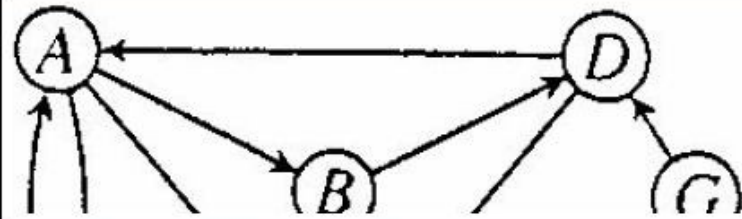


Answer ([Please click here to Add Answer](#))

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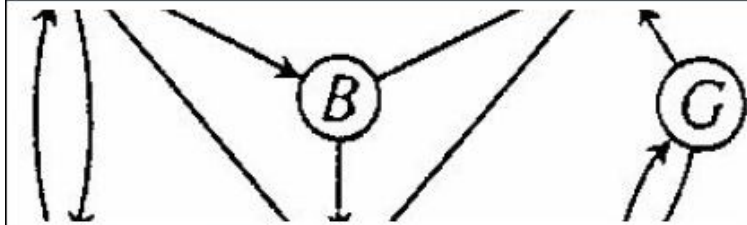


Answer ([Please click here to Add Answer](#))

VuAnswers.com

Rich text editor toolbar with icons for undo, redo, bold, italic, underline, bulleted list, numbered list, link, unlink, and a 100% zoom level.

Made by: Waqar Siddhu

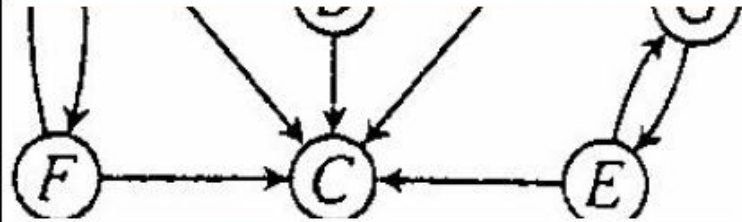


Answer ([Please click here to Add Answer](#))

VuAnswers.com

Normal | Arial | 12 | B I U | [List icons] | 100%

Made by: Waqar Siddhu



Answer ([Please click here to Add Answer](#))

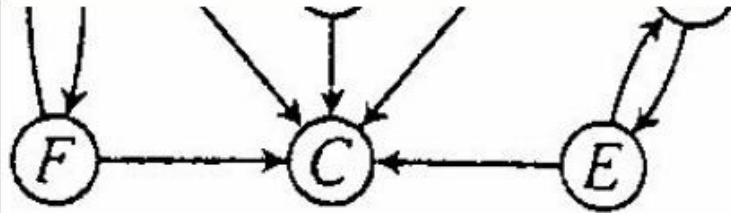
VuAnswers.com

Rich text editor toolbar with icons for file operations, editing, and formatting. The text area below is empty.

Made by: Waqar Siddhu

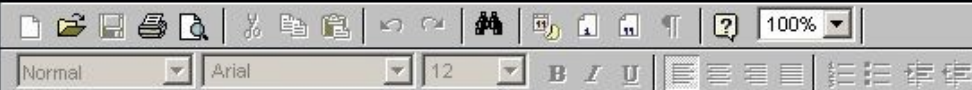
Question No : 50 of 52

Marks: 5 (Budgeted Time 10 Min)



Answer ([Please click here to Add Answer](#))

VuAnswers.com



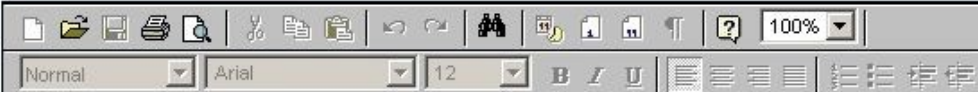
Made by: Waqar Siddhu

Develop the running time complexity analysis for the following piece of code. Adopt step wise approach along with asymptotic notation at the end.

```
i=1
while (i < n) {
    i++
}
for ( i=1;i <= n ;i=i*2 )
```

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 51 of 52

Marks: 5 (Budgeted Time 10 Min)

Develop the running time complexity analysis for the following piece of code. Adopt step wise approach along with asymptotic notation at the end.

```
i=1
while (i < n) {
    i++
}
for ( i=1;i <= n ;i=i*2 )
for ( j = 1; j <= i; ++j )
```

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Normal Arial 12 B I U

Made by: Waqar Siddhu

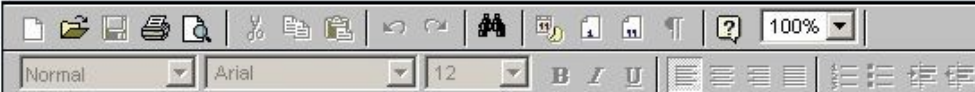
Question No : 52 of 52

Marks: 5 (Budgeted Time 10 Min)

Kruskal's algorithm can return different spanning trees for the same input graph G depending upon how ties are broken when edges are sorted. Prove that, for each minimum spanning tree T of G , there is a way to sort the edges of G in Kruskal's algorithm so that the algorithm returns T .

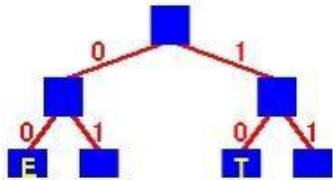
Answer ([Please click here to Add Answer](#))

VuAnswers.com



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

Total running time of BFS is

Answer (Please select your correct option)

VuAnswers.com

$O(V + E)$

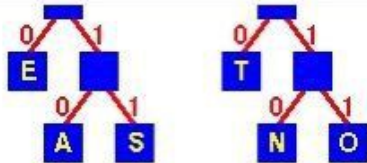
correct

$O(V - E)$

$O(VE)$

None of these

Made by: Waqar Siddhu



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

Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

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
- is efficient and both ways of variable and fixed length codes can be used
- is efficient time wise but not space wise

correct

Made by: Waqar Siddhu

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

Using ASCII standard the string "abacdaac" 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

correct

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

100

Balance

Character

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
- 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

correct

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
- 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

correct

130 pag

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
- necessarily acyclic
- not necessary it can be both cyclic and acyclic
- cyclic with some other constraints

correct

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 $O(n^k)$ belongs to

Answer (Please select your correct option)

VuAnswers.com

- | | | | |
|-----------------------|-----------------------|----------------|-----------------|
| <input type="radio"/> | NP-Class | <u>correct</u> | <u>not sure</u> |
| <input type="radio"/> | Co-Prime Class | | |
| <input type="radio"/> | P-Class | | |
| <input type="radio"/> | 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

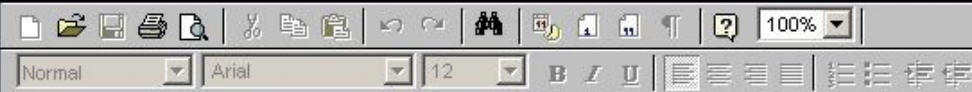
Divide and conquer

Made by: Waqar Siddhu

How we Heapify?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

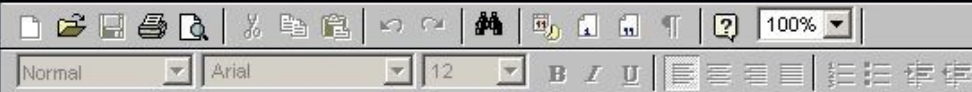
Question No : 42 of 52

Marks: 2 (Budgeted Time 4 Min)

Define Back Edge

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

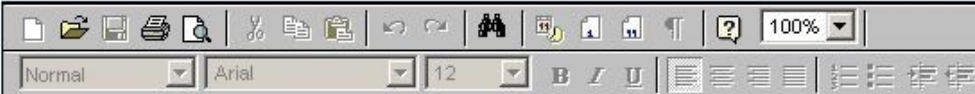
Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

Given an adjacency list for G , what is the time complexity to compute G^T ?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

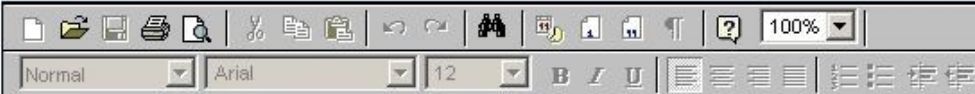
Question No : 44 of 52

Marks: 2 (Budgeted Time 4 Min)

What is Bellman-Ford algorithm's running time?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

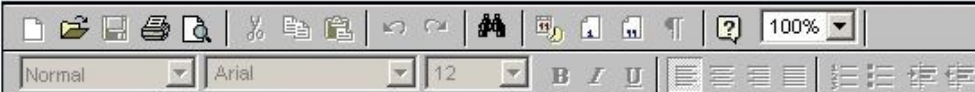
Question No : 45 of 52

Marks: 3 (Budgeted Time 6 Min)

Given a digraph $G = (V, E)$, consider any DFS forest of G and consider any edge $(u, v) \in E$. Prove that if this edge is a tree, forward or cross edge, then $f[u] > f[v]$ and if this edge is a back edge, then $f[u] \leq f[v]$.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

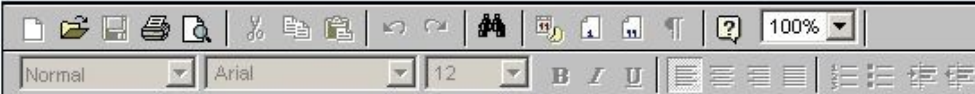
Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

How the Dijkstra's algorithm works?

Answer ([Please click here to Add Answer](#))

VuAnswers.com

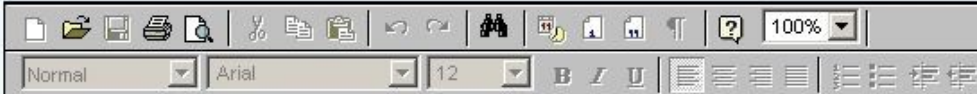


Made by: Waqar Siddhu

Modify QUICKSORT algorithm such that it sorts array into non-increasing order.

Answer ([Please click here to Add Answer](#))

VuAnswers.com

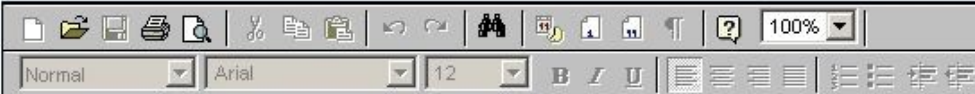


Made by: Waqar Siddhu

What do you mean by polynomial time algorithm? Explain what kind of problem can be solved by using polynomial time algorithm?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Normal Arial 12 B I U

Made by: Waqar Siddhu

You are given the task of laying down new railway lines which will connect all n cities. Thus for any pair of cities, you will end up with track connecting them. Note that two routes may share the same track; track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Agorithm

Answer ([Please click here to Add Answer](#))

VuAnswers.com



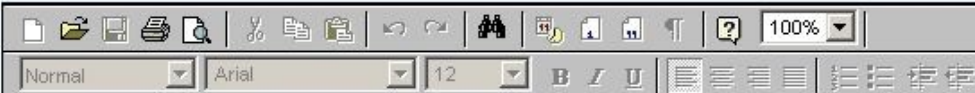
The image shows a rich text editor interface. At the top, there is a toolbar with various icons for file operations (save, print, search), editing (undo, redo, bold, italic, underline), and text alignment. Below the toolbar, there is a text area with a large empty space for writing an answer. The text area is currently empty.

Made by: Waqar Siddhu

Considering the recursive version of depth-first traversal implementing Timestamp Structure in pseudo code format, only write DFSVISTIT routine in pseudo code format

Answer ([Please click here to Add Answer](#))

VuAnswers.com

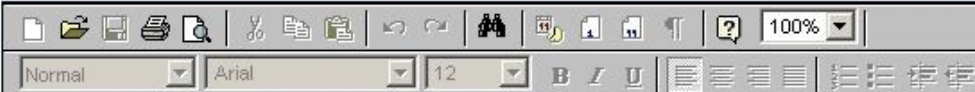


Made by: Waqar Siddhu

Considering the recursive version of depth-first traversal implementing Timestamp Structure in pseudo code format, only write DFSVISTIT routine in pseudo code format

Answer ([Please click here to Add Answer](#))

VuAnswers.com



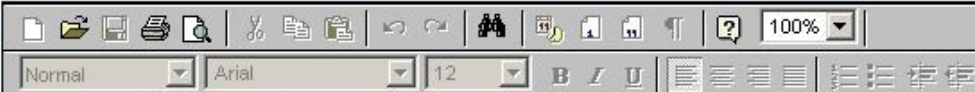
Made by: Waqar Siddhu

Develop the running time complexity analysis for the following piece of code. Adopt step wise approach along with asymptotic notation at the end.

```
i=1
while (i < n) {
    i++
}
for ( i=1;i <= n ;i=i*2 )
```

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 51 of 52

Marks: 5 (Budgeted Time 10 Min)

Develop the running time complexity analysis for the following piece of code. Adopt step wise approach along with asymptotic notation at the end.

```
i=1
while (i < n) {
    i++
}
for ( i=1;i <= n ;i=i*2 )
for ( j = 1; j <= i; ++j )
```

Answer ([Please click here to Add Answer](#))

VuAnswers.com



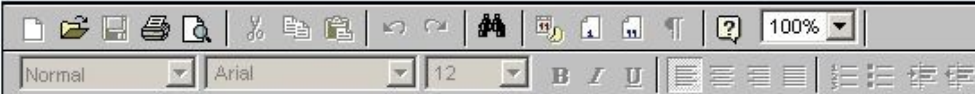
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Made by: Waqar Siddhu

Write pseudo code for Kruskal's algorithm.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

There are given two main connecting or transition railway lines between the following four cities. There are two parts of track, for the one end of that track connecting with Lahore and the other end of that track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Algorithm
- 4 Bellman Ford Algorithm.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Not a solution

An algorithm

Good solution

The best solution

ref moazz ffiles

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 ?

adjacency list requires $\Theta(n + e)$ storage
page 116

Answer (Please select your correct option)

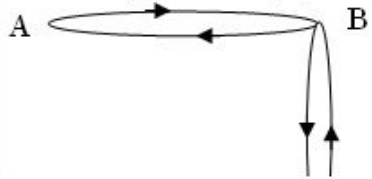
- $O(|V|^2)$
- $O(|V| + |E|)$
- $O(|V|^2 + |E|)$
- $O(|V| + |E|)$

Made by: Waqar Siddhu

Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)

The total degrees of the graph is



Answer (Please select your correct option)

3

5

6

9

Made by: Waqar Siddhu

Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

3



5



6



9



Made by: Waqar Siddhu

Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

3



5



6



9



Made by: Waqar Siddhu

Non-optimal or greedy algorithm for money change takes _____

Answer (Please select your correct option)

$O(k)$ ref moazz

$O(2^k)$

$O(N)$

$O(kN)$

Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman algorithm finds a (n) _____ solution.

Answer (Please select your correct option)

Optimal

p 102

Non-optimal

Exponential

Polynomial

Made by: Waqar Siddhu

Which formula is used for calculating worst case running time?

Answer (Please select your correct option)

$T_{worst}(n) = \max_{1 \leq I \leq n} T(I)$ p 13

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

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

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

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)

divide-and-conquer p 34

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)

n items p 34

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)

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

p 40

$2 * (h+1) - 1$

$2 * (h+1)$

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

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)

$\Theta(1)$

$\Theta(n^2)$ ref moazz files

$\Theta(n)$

$\Theta(n \log n)$

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)

Overlapping

Over costing

Optimized

None of these

not sure

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)

 (q)

p 84

 (1) (n^2) (n^3)

Made by: Waqar Siddhu

Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Much more efficient

Only fractional efficient

Worst

Too slow

Made by: Waqar Siddhu

Question No : 14 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

15

7

12

32

Made by: Waqar Siddhu

Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

Maximum number of edges in a Directed Graph may be

Answer (Please select your correct option)

V

2V

Approximately $|V|^2$

ref moazz files

\sqrt{V}

Made by: Waqar Siddhu

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

An adjacency matrix for a graph

Answer (Please select your correct option)

- always square in shape
- It is not necessary for it to be square in shape
- not sure
- Is square in shape for directed graphs but not for undirected graphs
- Is always diagonal matrix

Made by: Waqar Siddhu

Question No : 17 of 52

Marks: 1 (Budgeted Time 1 Min)

Using ASCII standard the string "ab-#&c" will be encoded _____ bytes

Answer (Please select your correct option)

16

7

6

This string cannot be stored using ASCII standard

Made by: Waqar Siddhu

Question No : 18 of 52

Marks: 1 (Budgeted Time 1 Min)

Using Huffman encoding technique the string "a@a" will be encoded with _____ bits

Answer (Please select your correct option)

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)

Value per unit weight in decreasing order

p 109

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)

- Larger
- Smallest
- Balance
- Character

p 100

Made by: Waqar Siddhu

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

Answer (Please select your correct option)

that no codeword is the prefix of any other p 101

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

Answer (Please select your correct option)

- are no Cross edges but have forward and back edges
- are only forward edges
- is convention of only back edges p 130
- is convention of forward edges

Made by: Waqar Siddhu

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

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

p 130

Made by: Waqar Siddhu

Kruskal's algorithm

Answer (Please select your correct option)

Choose the best non-cycle edge

ref moazz files

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

Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

In Prim's algorithm we use

Answer (Please select your correct option)

- Queue data structure
- Priority Queue data structure p 150
- 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)

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

creates a unique cycle p 142

it is not allowed to add the edge in free tree

creates multiple cycles

Made by: Waqar Siddhu

Floyd-Warshall algorithm is

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

Dijkstra's algorithm is used for

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

p 154

Made by: Waqar Siddhu

Bellman Ford algorithm applies relaxation to every

Answer (Please select your correct option)

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

p 160

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

Question No : 30 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- 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

Answer (Please select your correct option)

$\Theta(n^2)$

$\Theta(n^4)$

$\Theta(n^3)$

p 161

$\Theta(3^n)$

Made by: Waqar Siddhu

Question No : 32 of 52

Marks: 1 (Budgeted Time 1 Min)

If we can solve a single NP problem in P time

Answer (Please select your correct option)

All NP-problems can be solved

p 173

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

Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

If a problem is NP-complete

Answer (Please select your correct option)

it must be in P

it must also be in NP

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 _____

Answer (Please select your correct option)

- P
- NPC p 173
- Co-NP
- P and NP

Made by: Waqar Siddhu

Question No : 35 of 52

Marks: 1 (Budgeted Time 1 Min)

Clique cover problem arises in applications of _____.

Answer (Please select your correct option)

Map drawing

Clustering p 176

Architectural design

Clique

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)

Apart from

Far from

Near to

Adjacent to

p 176

Made by: Waqar Siddhu

Question No : 37 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

$O(n \log n)$

$O(n^2)$

$O(\log n)$

$O(n)$

Made by: Waqar Siddhu

Search techniques of various algorithms look at_____

Answer (Please select your correct option)

Many possible solutions p 97

Maximum 2 possible solutions

Minimum 2 possible solutions

Sorting solutions

Made by: Waqar Siddhu

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman encoding algorithm is a _____

Answer (Please select your correct option)

Dynamic and greedy algorithm

Divide and conquer and greedy algorithm

Geedy algorithm. p 99

Dynamic programming algorithm

Made by: Waqar Siddhu

Question No : 40 of 52

Marks: 1 (Budgeted Time 1 Min)

Breadth first search is shortest path algorithm that works

Answer / Please select your correct option)

- on un-weighted graphs p 153
- on weighted graphs
- on both weighted and un-weighted graphs
- BFS cannot be used for shortest path problems

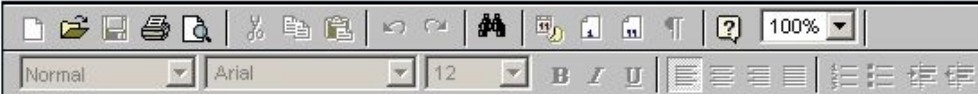
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Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

What are the essential elements of an algorithm?

Answer ([Please click here to Add Answer](#))



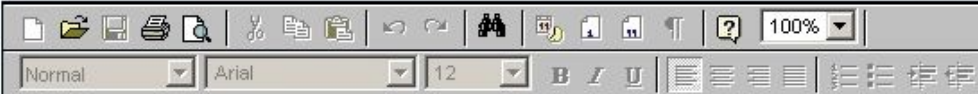
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Question No : 42 of 52

Marks: 2 (Budgeted Time 4 Min)

What is overall time for Kruskal's algorithm if the graph is sparse?

Answer ([Please click here to Add Answer](#))



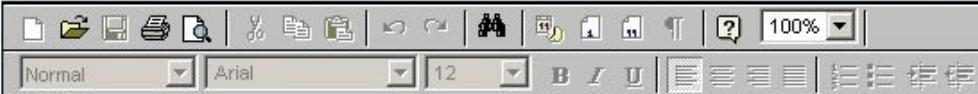
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Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

What is DFS and how does it work?

Answer ([Please click here to Add Answer](#))



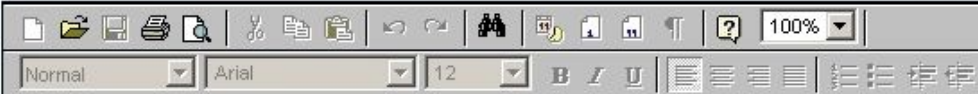
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Question No : 44 of 52

Marks: 2 (Budgeted Time 4 Min)

What is Bellman-Ford algorithm's running time?

Answer ([Please click here to Add Answer](#))

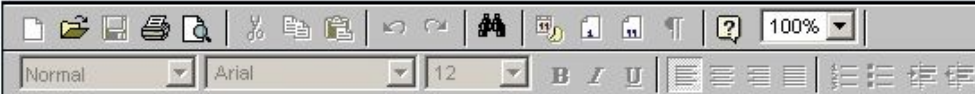


Made by: Waqar Siddhu

Explain the following two basic cases according to Floyd-Warshall Algorithm,

1. Don't go through vertex k at all.
2. Do go through vertex k.

Answer ([Please click here to Add Answer](#))



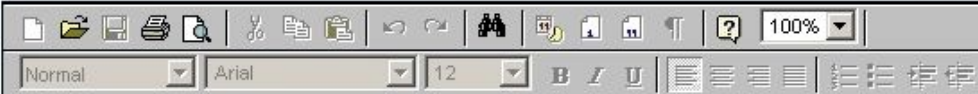
Made by: Waqar Siddhu

Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

Describe 2-d maxima problem in mathematical or algorithmic form.

Answer ([Please click here to Add Answer](#))



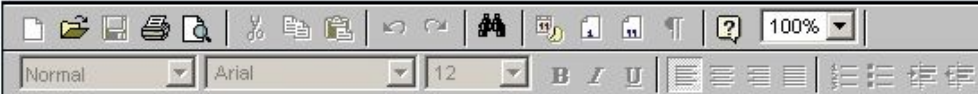
Made by: Waqar Siddhu

Question No : 47 of 52

Marks: 3 (Budgeted Time 6 Min)

Describe Minimum Spanning Trees Problem with examples.

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Let the adjacency list representation of an undirected graph is given below:

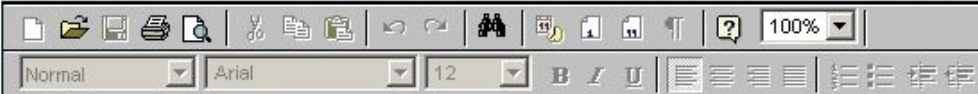
Is there any isolated vertex? If yes, Name the vertex.

What general property of the list indicates that the graph has an isolated vertex?

a → b → c → e

b → a → d

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

a → b → c → e
b → a → d
c → a → d → e → f
d → b → c → f
e → a → c → f

Answer ([Please click here to Add Answer](#))



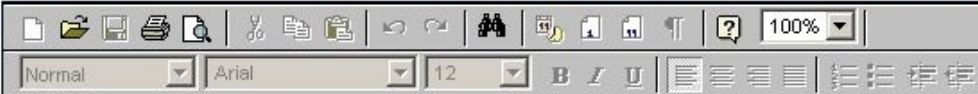
Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

b → a → d
c → a → d → e → f
d → b → c → f
e → a → c → f
f → c → d → e
g

Answer ([Please click here to Add Answer](#))



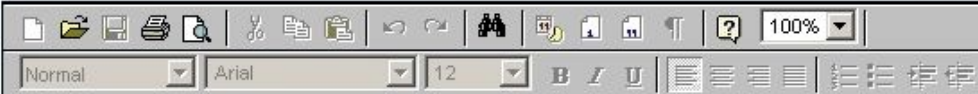
Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

c → a → d → e → f
d → b → c → f
e → a → c → f
f → c → d → e
g

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu


Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

You are given the task of laying down new railway lines which will connect all n cities. Thus for any pair of cities, you will end up with track connecting them. Note that two routes may share the same track; track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Agorithm

Answer ([Please click here to Add Answer](#))



Normal Arial 12 B I U

Made by: Waqar Siddhu


Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

Several given the most satisfying solution. You are given the following data. There are two pairs of cities, you are given the track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Algorithm
- 4 Bellman Ford Algorithm.

Answer ([Please click here to Add Answer](#))



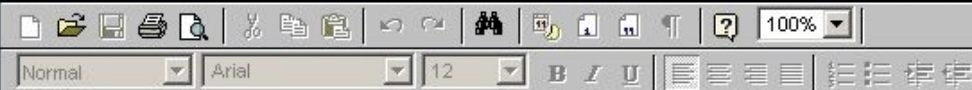
Normal Arial 12 B I U

Made by: Waqar Siddhu

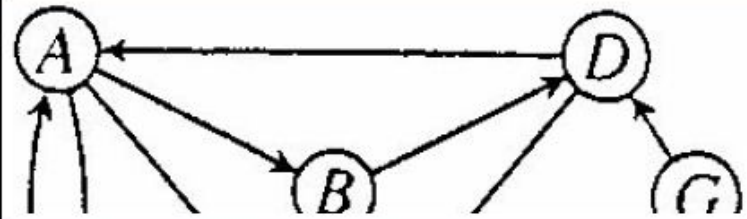
Show the result of time stamped DFS algorithm on the following graph. Take node E as a starting node. [You can show final result in exam software and need not to show all intermediate steps].



Answer ([Please click here to Add Answer](#))



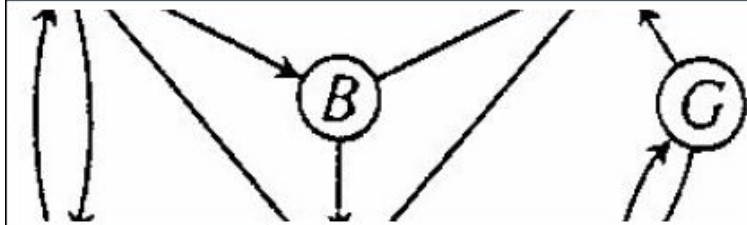
Made by: Waqar Siddhu



Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for undo, redo, bold, italic, underline, bulleted list, numbered list, link, unlink, and a 100% zoom level.

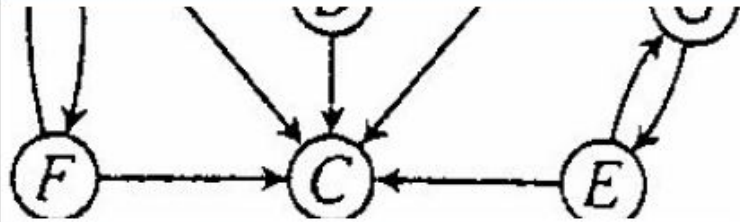
Rich text editor text area with a dropdown menu set to 'Normal', a font family dropdown set to 'Arial', and a font size dropdown set to '12'. The text area contains the signature: **Made by: Waqar Siddhu**



Answer ([Please click here to Add Answer](#))

Normal Arial 12 B I U

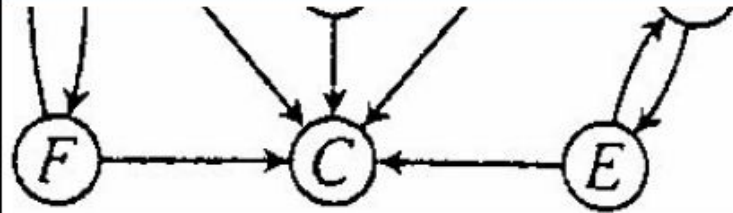
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Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for file operations, editing, and formatting. The text area below is empty.

Made by: Waqar Siddhu



Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for file operations, undo, redo, bold, italic, underline, text color, background color, bulleted list, numbered list, link, unlink, and a 100% zoom level.

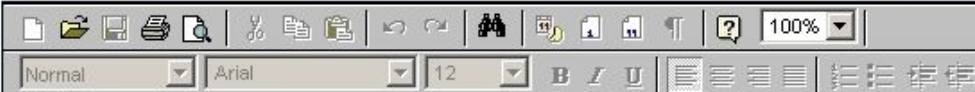
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Made by: Waqar Siddhu

Develop the running time complexity analysis for the following piece of code. Adopt step wise approach along with asymptotic notation at the end.

```
i=1
while (i < n) {
    i++
}
for ( i=1;i <= n ;i=i*2 )
```

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu


Question No : 51 of 52

Marks: 5 (Budgeted Time 10 Min)

Develop the running time complexity analysis for the following piece of code. Adopt step wise approach along with asymptotic notation at the end.

```
i=1
while (i < n) {
    i++
}
for ( i=1;i <= n ;i=i*2 )
for ( j = 1; j <= i; ++j )
```

Answer ([Please click here to Add Answer](#))



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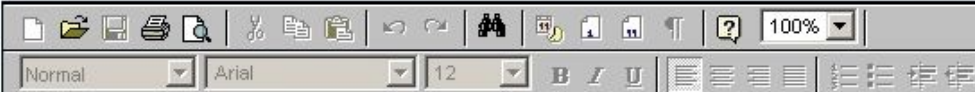
Made by: Waqar Siddhu

Question No : 52 of 52

Marks: 5 (Budgeted Time 10 Min)

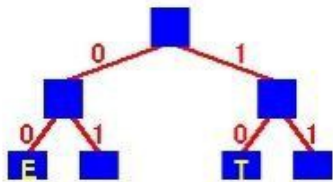
Kruskal's algorithm can return different spanning trees for the same input graph G depending upon how ties are broken when edges are sorted. Prove that, for each minimum spanning tree T of G , there is a way to sort the edges of G in Kruskal's algorithm so that the algorithm returns T .

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Consider the following Huffman Tree



Answer (Please select your correct option)

VuAnswers.com

10 00 010

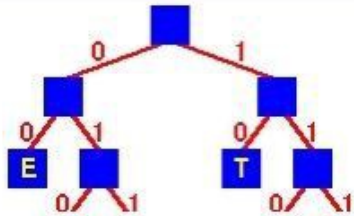
correct

011 00 010

10 00 110

11 10 110

Made by: Waqar Siddhu



Answer (Please select your correct option)

VuAnswers.com

10 00 010

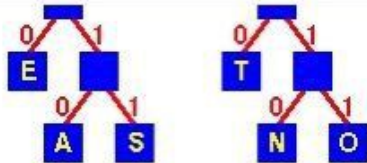
correct

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

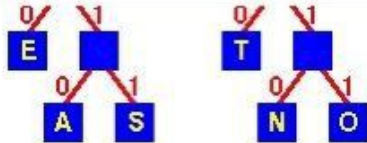
correct

011 00 010

10 00 110

11 10 110

Made by: Waqar Siddhu



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 $(v1,v2)$
- Lists require less space than *matrices* and they are faster to find the weight of an edge $(v1,v2)$
- Lists require more space than *matrices* and they take longer to find the weight of an edge $(v1,v2)$
- Lists require more space than *matrices* but are faster to find the weight of an edge $(v1,v2)$

correct

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

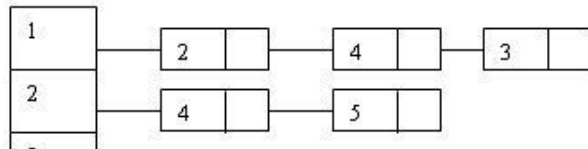
Non-optimal

Exponential

Polynomial

Made by: Waqar Siddhu

Consider the following adjacency list:



Answer (Please select your correct option)

VuAnswers.com

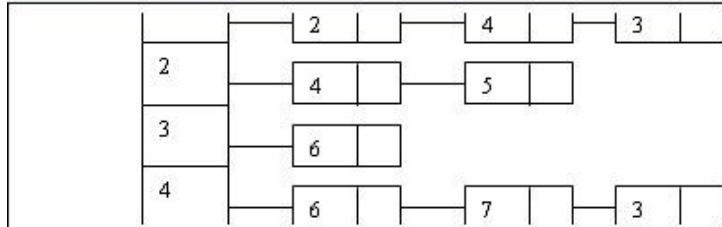


correct

Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

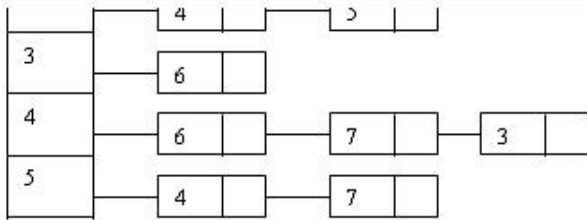
VuAnswers.com



Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

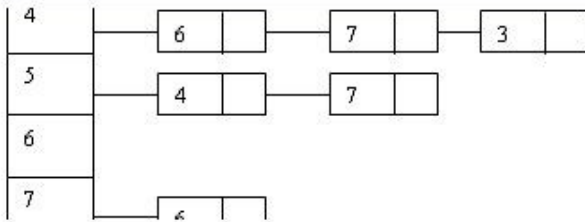
VuAnswers.com



Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)

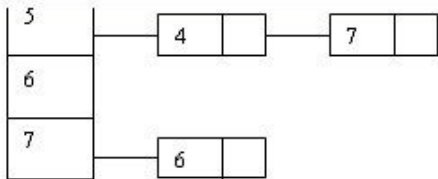


Answer (Please select your correct option)

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

Σ notation

Θ notation

Flowchart

correct

Asymptotic notation

Made by: Waqar Siddhu

Question No : 7 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

VuAnswers.com

Fully parenthesized

correct

Partially parenthesized

Not parenthesized

None of the options

Made by: Waqar Siddhu

Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

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

correct

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

correct

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
- 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

correct

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

Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Question No : 29 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

Polynomial time certificates

nal pta

Answer (Please select your correct option)

VuAnswers.com

- 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

Question No : 34 of 52

Marks: 1 (Budgeted Time 1 Min)

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 vise 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
- 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

correct

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

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

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
- on weighted graphs
- on both weighted and un-weighted graphs
- BFS cannot be used for shortest path problems

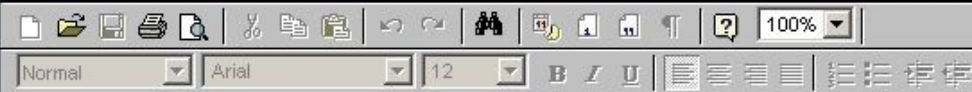
correct

Made by: Waqar Siddhu

What is heap and heap order?

Answer ([Please click here to Add Answer](#))

VuAnswers.com

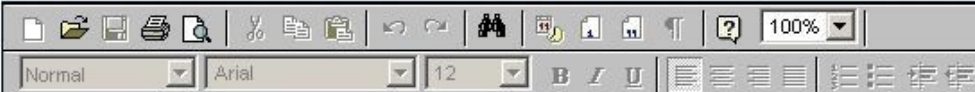


Made by: Waqar Siddhu

Define free tree.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



A free tree is a tree with no vertex designated as the root vertex. A free tree with n vertices has exactly $n - 1$ edges. There exists a unique path between any two vertices of a free tree. Adding any edge to a free tree creates a unique cycle. Breaking any edge on this cycle restores the free tree.

Made by: Waqar Siddhu

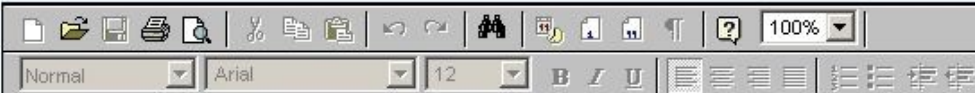
The following adjacency matrix represents a graph that consists of four vertices labeled 0, 1, 2 and 3. The entries in the matrix indicate edge weights.

| | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 3 |
| 1 | 2 | 0 | 4 | 0 |
| 2 | 0 | 1 | 0 | 1 |
| 3 | 2 | 0 | 0 | 0 |

Answer the following question:

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Normal Arial 12 B I U

Made by: Waqar Siddhu

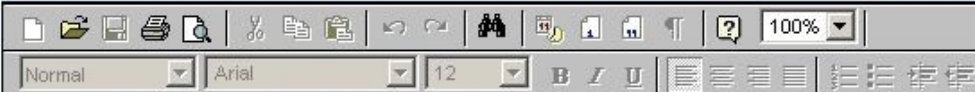
| | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 3 |
| 1 | 2 | 0 | 4 | 0 |
| 2 | 0 | 1 | 0 | 1 |
| 3 | 2 | 0 | 0 | 0 |

Answer the following question:

Can an adjacency matrix for a directed graph ever *not* be square in shape? Why or why not?

Answer ([Please click here to Add Answer](#))

VuAnswers.com

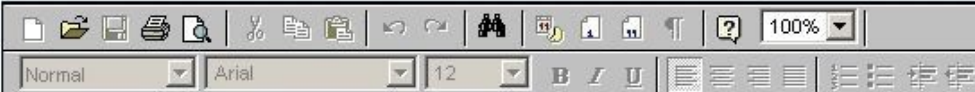


Made by: Waqar Siddhu

Where clique cover problem arises?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



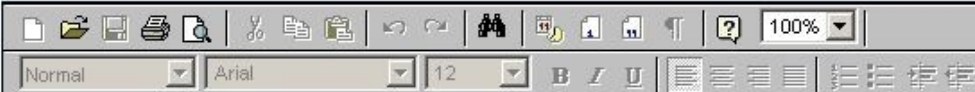
The clique cover problem arises in applications of clustering. We put an edge between two nodes if they are similar enough to be clustered in the same group. We want to know whether it is possible to cluster all the vertices into k groups.

Made by: Waqar Siddhu

Consider a digraph $G = (V, E)$ and any DFS forest for G . Prove that G has a cycle if and only if the DFS forest has a back edge.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Describe three asymptotic notations.

Answer ([Please click here to Add Answer](#))

VuAnswers.com

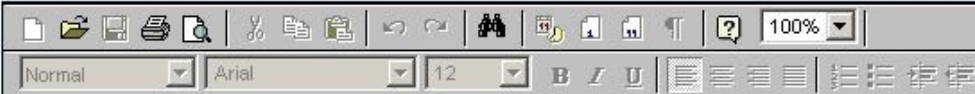


Made by: Waqar Siddhu

Briefly discuss at least three variants of the shortest path problem.

Answer ([Please click here to Add Answer](#))

VuAnswers.com

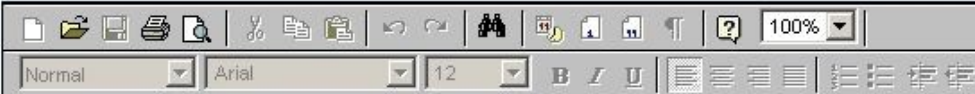


Made by: Waqar Siddhu

What do you mean by polynomial time algorithm? Explain what kind of problem can be solved by using polynomial time algorithm?

Answer ([Please click here to Add Answer](#))

VuAnswers.com

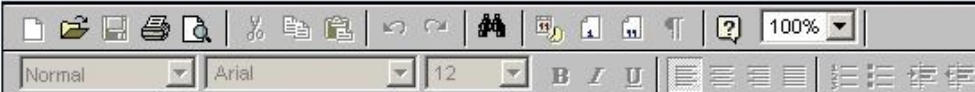


Made by: Waqar Siddhu

Suppose you could reduce an NP-complete problem to a polynomial time problem in polynomial time. What would be the consequence?

Answer ([Please click here to Add Answer](#))

VuAnswers.com

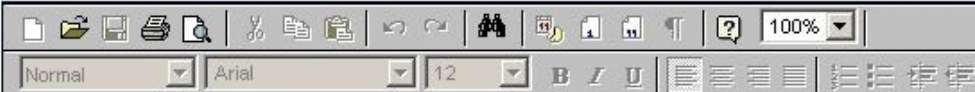


Made by: Waqar Siddhu

According to Dijkstra's Algorithm, write the pseudo code to relax a vertex.

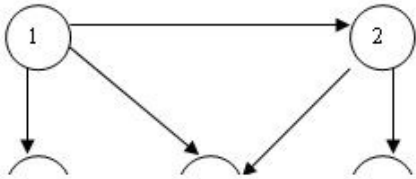
Answer ([Please click here to Add Answer](#))

VuAnswers.com



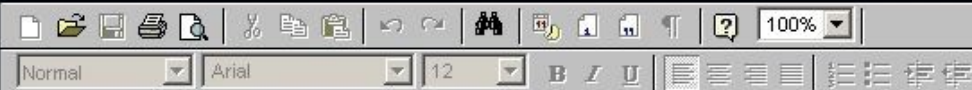
Made by: Waqar Siddhu

Find the adjacent list for the following graph

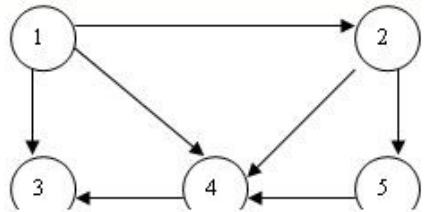


Answer ([Please click here to Add Answer](#))

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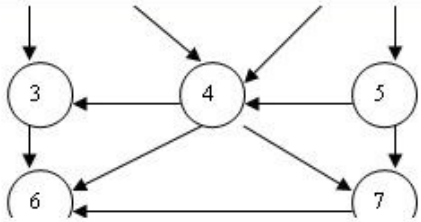


Answer ([Please click here to Add Answer](#))

VuAnswers.com

Rich text editor toolbar with icons for file operations, editing, and formatting. The text area below is empty.

Made by: Waqar Siddhu

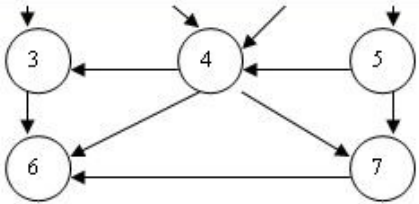


Answer ([Please click here to Add Answer](#))

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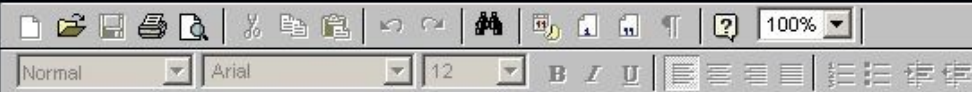
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Answer ([Please click here to Add Answer](#))

VuAnswers.com

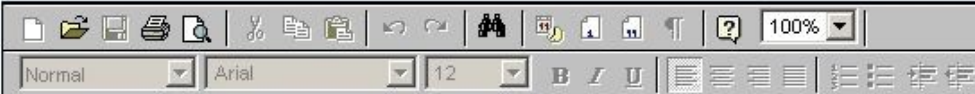


Made by: Waqar Siddhu

Draw the final **Max-Heap** structure for the following array,
50, 31, 45, 30, 2, 7, 40, 12, 28, 1
You can show the final result (tree) only.

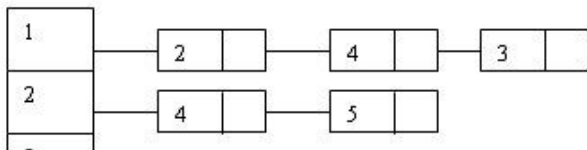
Answer ([Please click here to Add Answer](#))

VuAnswers.com



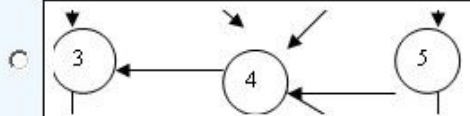
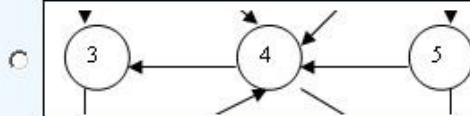
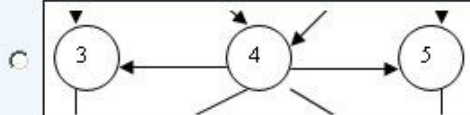
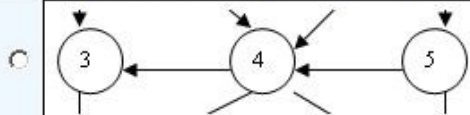
Made by: Waqar Siddhu

Consider the following adjacency list:



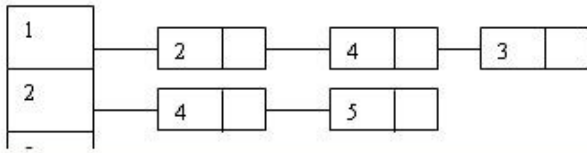
Answer (Please select your correct option)

VuAnswers.com



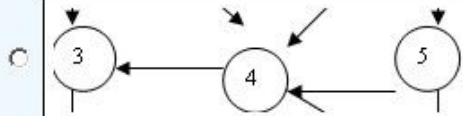
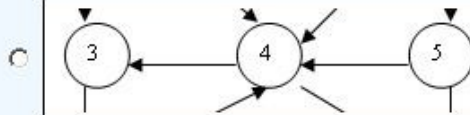
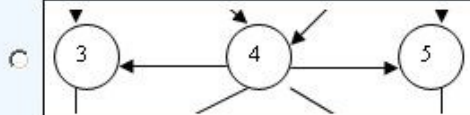
Made by: Waqar Siddhu

Consider the following adjacency list:



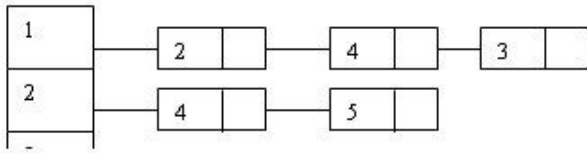
Answer (Please select your correct option)

VuAnswers.com



Made by: Waqar Siddhu

Consider the following adjacency list:



Answer (Please select your correct option)

VuAnswers.com



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

Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Question No : 9 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Question No : 32 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Question No : 35 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Question No : 36 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Made by: Waqar Siddhu

Question No : 38 of 52

Marks: 1 (Budgeted Time 1 Min)

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.

Made by: Waqar Siddhu

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

Made by: Waqar Siddhu

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

Made by: Waqar Siddhu

In strong components problem what complete refers to?

Answer ([Please click here to Add Answer](#))

VuAnswers.com

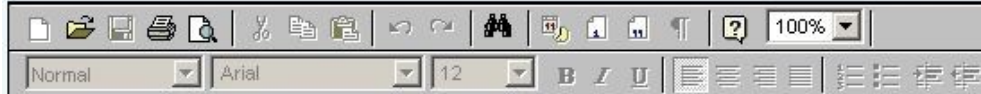


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What are quadratic series?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

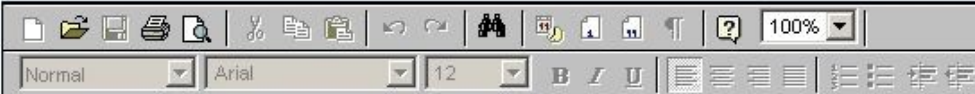
Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

What is overall time for Kruskal's algorithm if the graph is sparse?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

When a problem is called a decision problem?

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

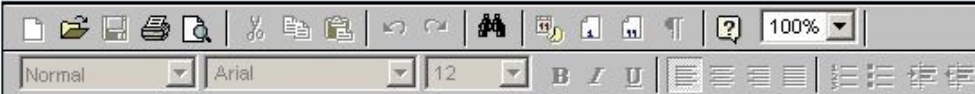
Question No : 45 of 52

Marks: 3 (Budgeted Time 6 Min)

Formally describe Minimum Spanning Trees Problem.

Answer ([Please click here to Add Answer](#))

VuAnswers.com

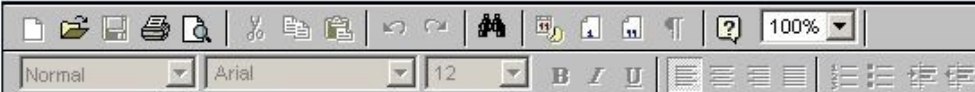


Made by: Waqar Siddhu

True or false: A sequence of values in a column of the dynamic programming table for an instance of the knapsack problem is always non-decreasing? Give a brief description.

Answer ([Please click here to Add Answer](#))

VuAnswers.com

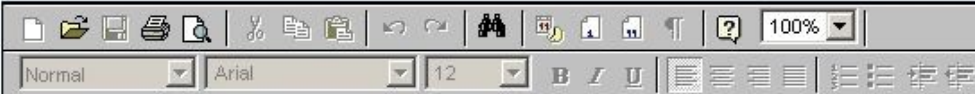


Made by: Waqar Siddhu

Describe the relation between mutually reachable, equivalence relation, and component digraph.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

You are given the task of laying down new railway line between Peshawar and Karachi. There are n intermediate cities that can be used and you know the cost of laying track between any pair of these cities. Your goal is to spend the least total amount of track to construct the railway line. How would you determine the least amount of track and the cities to go through? Name the best algorithm which addresses the above problem.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

You are given the task of laying down new railway lines which will connect all n cities. Thus for any pair of cities, you will end up with track connecting them. Note that two routes may share the same track; track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Agorithm

Answer ([Please click here to Add Answer](#))

VuAnswers.com



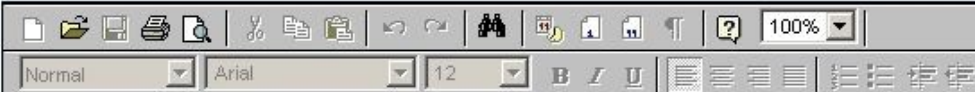
The image shows a rich text editor interface. At the top, there is a toolbar with various icons for file operations (save, print, search), editing (undo, redo, bold, italic, underline), and formatting (bullet points, numbered lists, indent). The font settings are set to 'Normal', 'Arial', and size '12'. The main text area is empty. In the bottom right corner, there is a large, stylized signature that reads 'Made by: Waqar Siddhu'.

Following is not the minimum spanning tree convert it into MST. [You can show final result in exam software and need not to show all intermediate steps].



Answer ([Please click here to Add Answer](#))

VuAnswers.com



Made by: Waqar Siddhu

Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

There are given two main connecting or transition railway lines between the following four cities. There are two pairs of cities, for the one pair of cities, you can use up that main connecting line. There are two rows of cities, each one being track; track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Algorithm
- 4 Bellman Ford Algorithm.

Answer ([Please click here to Add Answer](#))

VuAnswers.com



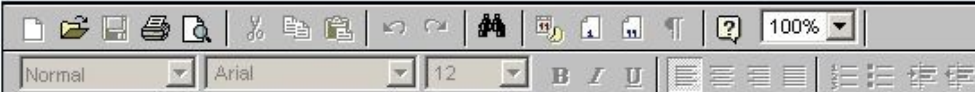
Made by: Waqar Siddhu

Following is not the minimum spanning tree convert it into MST. [You can show final result in exam software and need not to show all intermediate steps].

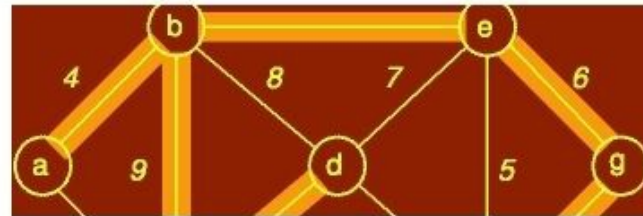


Answer ([Please click here to Add Answer](#))

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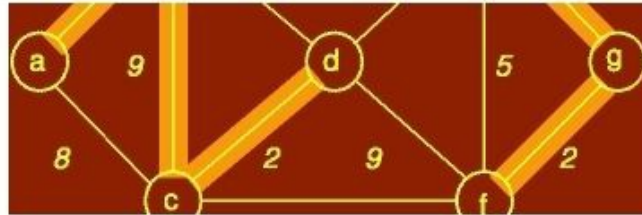


Answer (Please [click here](#) to Add Answer)

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Rich text editor toolbar with icons for undo, redo, bold, italic, underline, list, link, unlink, and a 100% zoom level. Below the icons, the text 'Normal' is selected in a dropdown menu, followed by 'Arial' in another dropdown, and '12' in a third dropdown. To the right are icons for bold (B), italic (I), and underline (U).

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Answer ([Please click here to Add Answer](#))

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Answer ([Please click here to Add Answer](#))

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Consider the following recursive search function which returns the index of the array element containing key, if such an element exists. Find out what is the complexity of search and show your work.

```
int search( int* array, int left, int right, int key){  
    int mid = (left + right)/2;  
    if( left == right )  
        return left;
```

Answer ([Please click here to Add Answer](#))

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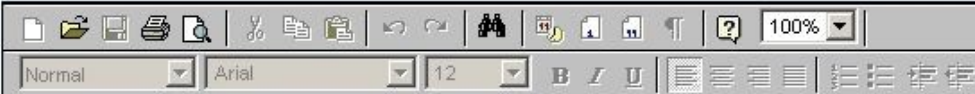


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```
return left;
else if( array[mid] <= key )
    return search( array, mid+1, right, key );
else
    return search( array, left, mid, key );
}
```

Answer ([Please click here to Add Answer](#))

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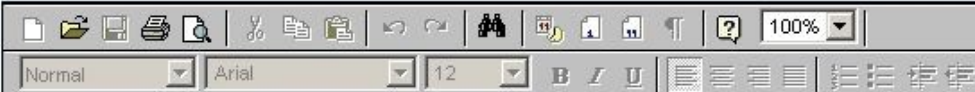


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Write pseudo code for the algorithm, if we implement the bag of knapsack by using a stack.

Answer ([Please click here to Add Answer](#))

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Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Not a solution

An algorithm

Good solution

The best solution

Correct Answer solved by hadi correct answer
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Cell : 03228043306

Made by: Waqar Siddhu

Question No : 2 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

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

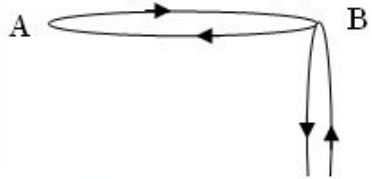
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Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)

The total degrees of the graph is



Answer (Please select your correct option)

3

5

6

9

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Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

3

5

6

9

Made by: Waqar Siddhu

Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

3



5



6



9



Made by: Waqar Siddhu

Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

Non-optimal or greedy algorithm for money change takes _____

Answer (Please select your correct option)

- | | | | |
|-----------------------|----------|----------------------------------|---|
| <input type="radio"/> | $O(k)$ | correct answer solved by hadi | Correct Answer solved by hadi email : usmanraj20@gmail.com Cell : 03228043306 |
| <input type="radio"/> | $O(2^k)$ | | |
| <input type="radio"/> | $O(N)$ | | |
| <input type="radio"/> | $O(kN)$ | | |

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The Huffman algorithm finds a (n) _____ solution.

Answer (Please select your correct option)

- Optimal correct answer
solved by hadi
- Non-optimal
- Exponential
- Polynomial

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Which formula is used for calculating worst case running time?

Answer (Please select your correct option)

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

correct answer
solved by hadi

Correct Answer solved by hadi
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$T_{worst}(n) = \max_{1 \leq I \leq 1} T(I)$

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

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

Made by: Waqar Siddhu

Question No : 7 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- divide-and-conquer correct answer
solved by hadi
- decrease and conquer
- greedy nature
- 2-dimension Maxima

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Question No : 8 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

- | | | | |
|-----------------------|----------|----------------------------------|---|
| <input type="radio"/> | n items | correct answer solved by hadi | Correct Answer solved by hadi email : usmanraj20@gmail.com Cell : 03228043306 |
| <input type="radio"/> | phases | | |
| <input type="radio"/> | pointers | | |
| <input type="radio"/> | constant | | |

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

Answer (Please select your correct option)

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

correct answer
solved by hadi

$2 * (h+1) - 1$

$2 * (h+1)$

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

Made by: Waqar Siddhu

Question No : 10 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

$\Theta(1)$

$\Theta(n^2)$

correct answer
solved by hadi

$\Theta(n)$

$\Theta(n \log n)$

Made by: Waqar Siddhu

Question No : 11 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

Overlapping

correct answer
solved by hadi

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Over costing

Optimized

None of these

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Question No : 12 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

(q)

correct answer
solved by hadi

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(1)

(n^2)

(n^3)

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Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Much more efficient

Only fractional efficient

Worst

Too slow

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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)

15

7

12

32

correct answer
solved by hadi

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Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

Maximum number of edges in a Directed Graph may be

Answer (Please select your correct option)

V

2V

Approximately $|V|^2$

\sqrt{V}

correct answer
solved by hadi

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Made by: Waqar Siddhu

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

An adjacency matrix for a graph

Answer (Please select your correct option)

- always square in shape
- It is not necessary for it to be square in shape
- Is square in shape for directed graphs but not for undirected graphs
- Is always diagonal matrix

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 17 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

16

7

6

This string cannot be stored using ASCII standard

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 18 of 52

Marks: 1 (Budgeted Time 1 Min)

Using Huffman encoding technique the string "a@a" will be encoded with _____ bits

Answer (Please select your correct option)

5

6

8

Huffman encoding fail at this string

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 19 of 52

Marks: 1 (Budgeted Time 1 Min)

In fractional knapsack we sort the

Answer (Please select your correct option)

Value per unit weight in decreasing order

correct answer
solved by hadi

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Weight per unit value in decreasing order

Value per unit weight in increasing order

Weight per unit value in increasing order

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

Answer (Please select your correct option)

Larger

Smallest

Balance

Character

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 21 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

that no codeword is the prefix of any other

correct answer
solved by hadi

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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

Question No : 22 of 52

Marks: 1 (Budgeted Time 1 Min)

In undirected graphs there

Answer (Please select your correct option)

are no Cross edges but have forward and back edges

are only forward edges

is convention of only back edges

is convention of forward edges

correct answer
solved by hadi

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Question No : 23 of 52

Marks: 1 (Budgeted Time 1 Min)

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

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 answer
solved by hadi

Made by: Waqar Siddhu

Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

Kruskal's algorithm

Answer (Please select your correct option)

Choose the best non-cycle edge

correct answer
solved by hadi

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Choose the best tree edge

Choose the vertex that gives the lightest weight

Follow the dynamic programming rules for choosing edges

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Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

In Prim's algorithm we use

Answer (Please select your correct option)

Queue data structure

Priority Queue data structure

Stack data structure

Both stack and Queue data structures

correct answer
solved by hadi

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Question No : 26 of 52

Marks: 1 (Budgeted Time 1 Min)

Adding any edge to a free tree

Answer (Please select your correct option)

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

correct answer
solved by hadi

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Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

Floyd-Warshall algorithm is

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 answer
solved by hadi

Made by: Waqar Siddhu

Question No : 28 of 52

Marks: 1 (Budgeted Time 1 Min)

Dijkstra's algorithm is used for

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 answer
solved by hadi

Made by: Waqar Siddhu

Question No : 29 of 52

Marks: 1 (Budgeted Time 1 Min)

Bellman Ford algorithm applies relaxation to every

Answer (Please select your correct option)

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

correct answer
solved by hadi

Correct Answer solved by hadi
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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

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Question No : 30 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- 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

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Question No : 31 of 52

Marks: 1 (Budgeted Time 1 Min)

Running time of Floyd-Warshall algorithm is

Answer (Please select your correct option)

$\Theta(n^2)$

$\Theta(n^4)$

$\Theta(n^3)$

$\Theta(3^n)$

correct answer
solved by hadi

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Question No : 32 of 52

Marks: 1 (Budgeted Time 1 Min)

If we can solve a single NP problem in P time

Answer (Please select your correct option)

All NP-problems can be solved

correct answer
solved by hadi

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

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Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

If a problem is NP-complete

Answer (Please select your correct option)

it must be in P

it must also be in NP

there is no relation between NP and NP-complete

it can be solved in P time

correct answer
solved by hadi

Correct Answer solved by hadi
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Question No : 34 of 52

Marks: 1 (Budgeted Time 1 Min)

3-color problem is known as _____

Answer (Please select your correct option)

- P
- NPC
correct answer
solved by hadi
- Co-NP
- P and NP

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Question No : 35 of 52

Marks: 1 (Budgeted Time 1 Min)

Clique cover problem arises in applications of _____.

Answer (Please select your correct option)

Map drawing

Clustering

Architectural design

Clique

correct answer
solved by hadi

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Question No : 36 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

Apart from

Far from

Near to

Adjacent to

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 37 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

$O(n \log n)$

correct answer
solved by hadi

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$O(n^2)$

$O(\log n)$

$O(n)$

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Question No : 38 of 52

Marks: 1 (Budgeted Time 1 Min)

Search techniques of various algorithms look at_____

Answer (Please select your correct option)

- Many possible solutions correct answer
solved by hadi
- Maximum 2 possible solutions
- Minimum 2 possible solutions
- Sorting solutions

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Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman encoding algorithm is a _____

Answer (Please select your correct option)

Dynamic and greedy algorithm

Divide and conquer and greedy algorithm

Geedy algorithm.

correct answer
solved by hadi

Correct Answer solved by hadi
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Dynamic programming algorithm

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Question No : 40 of 52

Marks: 1 (Budgeted Time 1 Min)

Breadth first search is shortest path algorithm that works

Answer (Please select your correct option)

on un-weighted graphs

correct answer
solved by hadi

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on weighted graphs

on both weighted and un-weighted graphs

BFS cannot be used for shortest path problems

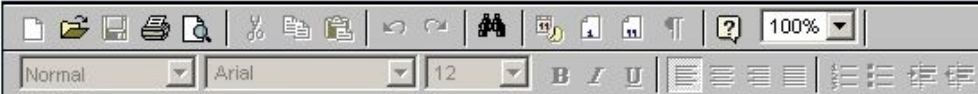
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Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

What are the essential elements of an algorithm?

Answer ([Please click here to Add Answer](#))



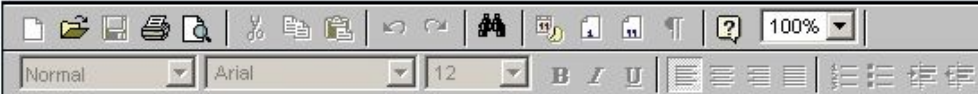
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Question No : 42 of 52

Marks: 2 (Budgeted Time 4 Min)

What is overall time for Kruskal's algorithm if the graph is sparse?

Answer ([Please click here to Add Answer](#))



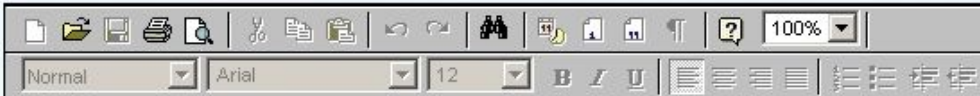
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Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

What is DFS and how does it work?

Answer ([Please click here to Add Answer](#))



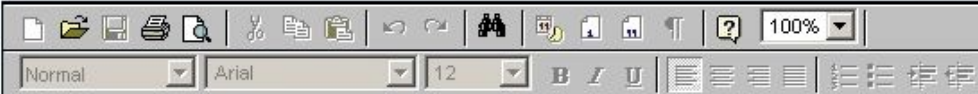
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Question No : 44 of 52

Marks: 2 (Budgeted Time 4 Min)

What is Bellman-Ford algorithm's running time?

Answer ([Please click here to Add Answer](#))

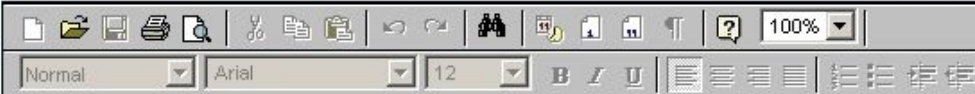


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Explain the following two basic cases according to Floyd-Warshall Algorithm,

1. Don't go through vertex k at all.
2. Do go through vertex k.

Answer ([Please click here to Add Answer](#))



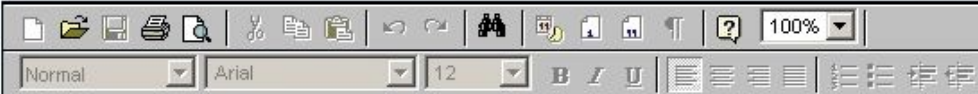
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Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

Describe 2-d maxima problem in mathematical or algorithmic form.

Answer ([Please click here to Add Answer](#))



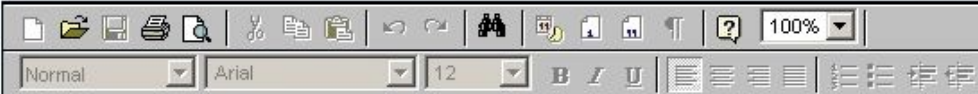
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Question No : 47 of 52

Marks: 3 (Budgeted Time 6 Min)

Describe Minimum Spanning Trees Problem with examples.

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Let the adjacency list representation of an undirected graph is given below:

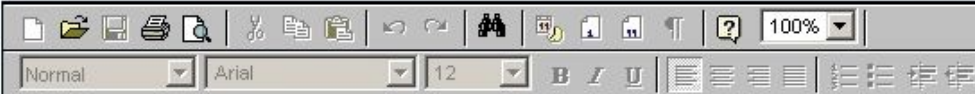
Is there any isolated vertex? If yes, Name the vertex.

What general property of the list indicates that the graph has an isolated vertex?

a → b → c → e

b → a → d

Answer ([Please click here to Add Answer](#))



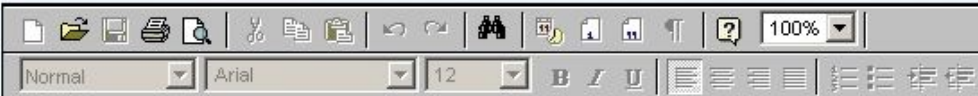
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Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

a → b → c → e
b → a → d
c → a → d → e → f
d → b → c → f
e → a → c → f

Answer ([Please click here to Add Answer](#))



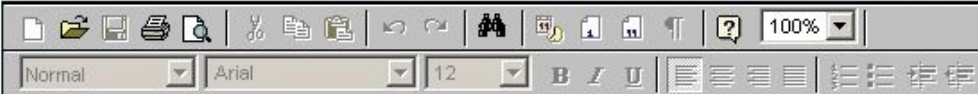
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Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

b → a → d
c → a → d → e → f
d → b → c → f
e → a → c → f
f → c → d → e
g

Answer ([Please click here to Add Answer](#))



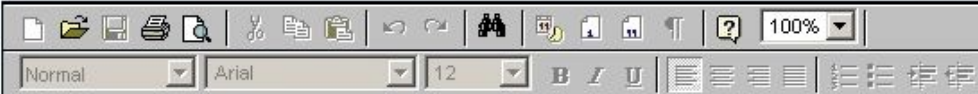
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Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

c → a → d → e → f
d → b → c → f
e → a → c → f
f → c → d → e
g

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu


Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

You are given the task of laying down new railway lines which will connect all n cities. Thus for any pair of cities, you will end up with track connecting them. Note that two routes may share the same track; track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Agorithm

Answer ([Please click here to Add Answer](#))



Normal Arial 12 B I U

Made by: Waqar Siddhu

Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

Several given two most connecting or maximum capacity roads between two cities. There are two parts of roads, you may build up them which connecting with a new station. You may build the station track; track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

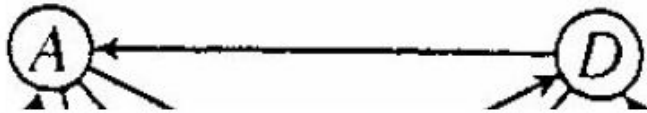
- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Algorithm
- 4 Bellman Ford Algorithm.

Answer ([Please click here to Add Answer](#))

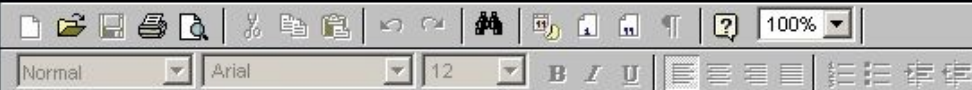


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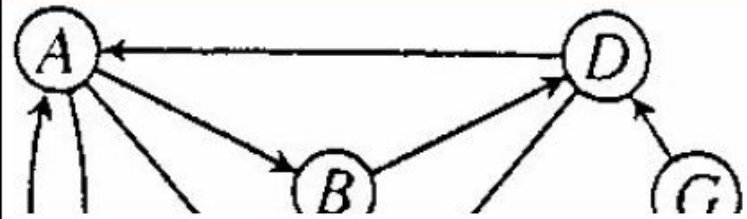
Show the result of time stamped DFS algorithm on the following graph. Take node E as a starting node. [You can show final result in exam software and need not to show all intermediate steps].



Answer ([Please click here to Add Answer](#))



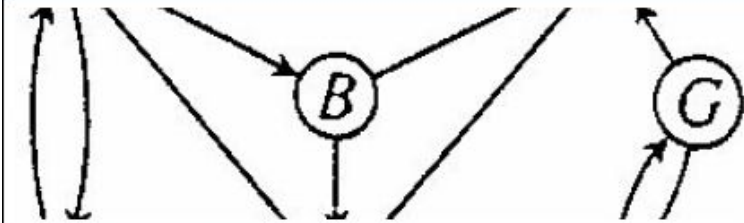
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Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for undo, redo, bold, italic, underline, list, link, unlink, and a 100% zoom level.

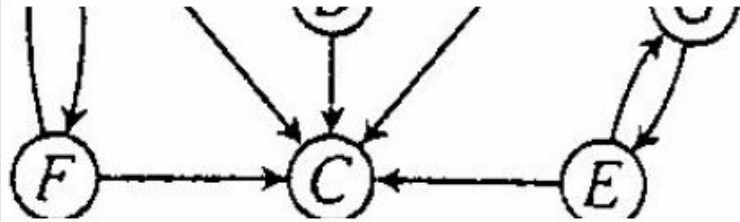
Rich text editor content area with a text box containing the text: **Made by: Waqar Siddhu**



Answer ([Please click here to Add Answer](#))

Normal Arial 12 B I U

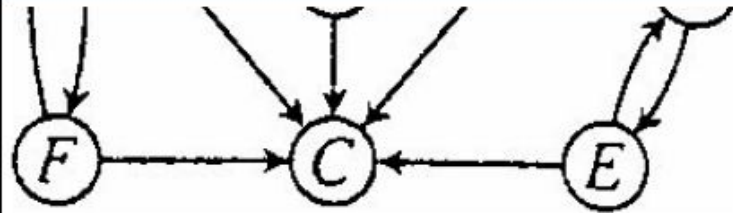
Made by: Waqar Siddhu



Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for file operations, editing, and formatting. The text area is currently empty.

Made by: Waqar Siddhu



Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for file operations, editing, and formatting. The text area below is empty.

Made by: Waqar Siddhu

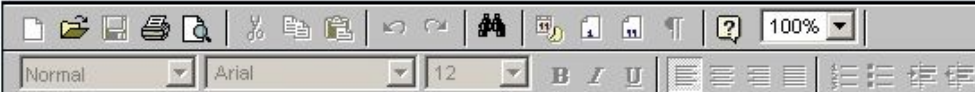
Question No : 51 of 52

Marks: 5 (Budgeted Time 10 Min)

Develop the running time complexity analysis for the following piece of code. Adopt step wise approach along with asymptotic notation at the end.

```
i=1
while (i < n) {
    i++
}
for ( i=1;i <= n ;i=i*2 )
```

Answer ([Please click here to Add Answer](#))



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Question No : 51 of 52

Marks: 5 (Budgeted Time 10 Min)

Develop the running time complexity analysis for the following piece of code. Adopt step wise approach along with asymptotic notation at the end.

```
i=1
while (i < n) {
    i++
}
for ( i=1;i <= n ;i=i*2 )
for ( j = 1; j <= i; ++j )
```

Answer ([Please click here to Add Answer](#))



Normal Arial 12 B I U

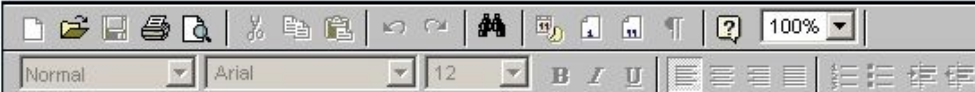
Made by: Waqar Siddhu

Question No : 52 of 52

Marks: 5 (Budgeted Time 10 Min)

Kruskal's algorithm can return different spanning trees for the same input graph G depending upon how ties are broken when edges are sorted. Prove that, for each minimum spanning tree T of G , there is a way to sort the edges of G in Kruskal's algorithm so that the algorithm returns T .

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman algorithm finds a (n) _____ solution.

Answer (Please select your correct option)

- | | | | |
|-----------------------|-------------|----------------------------------|---|
| <input type="radio"/> | Optimal | correct answer solved by hadi | Correct Answer solved by hadi email : usmanraj20@gmail.com Cell : 03228043306 |
| <input type="radio"/> | Non-optimal | | |
| <input type="radio"/> | Exponential | | |
| <input type="radio"/> | Polynomial | | |

Question No : 2 of 52

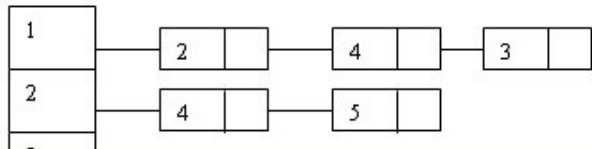
Marks: 1 (Budgeted Time 1 Min)

Using ASCII standard the string "abacdaaac" will be encoded with _____ bits.

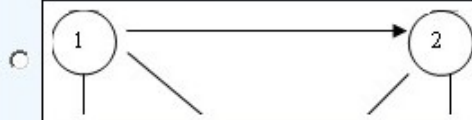
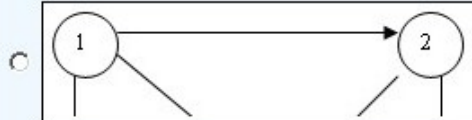
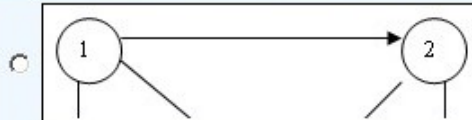
Answer (Please select your correct option)

- 80 correct answer
solved by hadi
- 160
- 320
- 100

Consider the following adjacency list:



Answer (Please select your correct option)



Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

8 bits

80 bits

Less than 50 bits

More than 50 bits

correct answer
solved by hadi

Correct Answer solved by hadi
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Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)

Al-Khwarizmi's work was written in a book titled _____

Answer (Please select your correct option)

al Kitab al-mukhtasar fi hisab al-jabrwa'l-muqabalah

correct answer
solved by hadi

Calculation by Completion

al Kitab

al-jabrwa'l-muqabalah

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Question No : 6 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

(log n) order

increasing order only

decreasing order only

heap order

correct answer
solved by hadi

Correct Answer solved by hadi
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Question No : 7 of 52

Marks: 1 (Budgeted Time 1 Min)

The running time of quick sort depends heavily on the selection of

Answer (Please select your correct option)

Required Output

Input and output

Pivot

Input data only

correct answer
solved by hadi

Question No : 8 of 52

Marks: 1 (Budgeted Time 1 Min)

If a sorting algorithm solely based on comparisons of keys in the array then it is impossible to sort more efficiently than

Answer (Please select your correct option)

$\Omega(n \lg n)$

correct answer
solved by hadi

$\Theta(n \lg n)$

$O(n \lg n)$

None of these

Question No : 9 of 52

Marks: 1 (Budgeted Time 1 Min)

Fibonacci sequence was posed by

Answer (Please select your correct option)

Leonardo Pisano

correct answer
solved by hadi

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Leonardo Picasso

Leonardo Lewinski

Karl Marx

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

Answer (Please select your correct option)

$\Phi = 1.618$

correct answer
solved by hadi

$\Phi = 3.142$

$\Phi = 1.816$

$\Phi = 1.168$

Question No : 11 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

Five

Four

Three

Two

Question No : 12 of 52

Marks: 1 (Budgeted Time 1 Min)

Maximum number of edges in a Directed Graph may be

Answer (Please select your correct option)

V

2V

Approximatly $|V|^2$

$v/2$

correct answer
solved by hadi

Correct Answer solved by hadi
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The worst case running time of the algorithm given below is,

```
MAXIMA(int n, Point P[1...n])
```

```
1  for i ← 1 to n n times
```

```
2  do maximal ← true
```

Answer (Please select your correct option)

$\Theta(n^6)$

$\Theta\left(n^{\frac{2n}{6}}\right)$

$\Theta(n^2)$

correct answer
solved by hadi

$\Theta(2n \lg 6)$

Question No : 14 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman algorithm finds

Answer (Please select your correct option)

sometime optimal some time non optimal solution

space wise optimal and time wise non optimal solution

a non-optimal solution

an optimal solution

correct answer
solved by hadi

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The Huffman algorithm time complexity

Answer (Please select your correct option)

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 $O(n^2)$

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

Using ASCII standard the string "abacdaaca" will be encoded with

Answer (Please select your correct option)

216 bits

72 bits

144 bits

36 bits

correct answer
solved by hadi

Correct Answer solved by hadi
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Using ASCII standard **the string "abacdaac"**

Answer (Please select your correct option)

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

correct answer
solved by hadi

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

Answer (Please select your correct option)

5



6



8



Huffman encoding fail at this string



correct answer
solved by hadi

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Question No : 19 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

that no codeword is the prefix of any other

correct answer
solved by hadi

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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 generic graph traversal algorithm we

Answer (Please select your correct option)

put vertices in the bag data structure

put edges in the bag data structure

correct answer
solved by hadi

put edges in stack data structure

put vertices in the stack data structure

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Question No : 21 of 52

Marks: 1 (Budgeted Time 1 Min)

In undirected graphs there

Answer (Please select your correct option)

are no Cross edges but have forward and back edges

are only forward edges

is convention of only back edges

is convention of forward edges

correct answer
solved by hadi

Correct Answer solved by hadi
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Question No : 22 of 52

Marks: 1 (Budgeted Time 1 Min)

Precedence constraint graph is

Answer (Please select your correct option)

non acyclic directed graph

acyclic undirected graph

non acyclic undirected graph

acyclic directed graph

correct answer
solved by hadi

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Question No : 23 of 52

Marks: 1 (Budgeted Time 1 Min)

when the graph has relatively few edges

Answer (Please select your correct option)

Kruskal's algorithm is better than Prim's

correct answer
solved by hadi

Correct Answer solved by hadi
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No one has priority over each other

the assumption few edges is not valid

Prim's algorithm is better than Kruskal's

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Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

A free tree with “n” vertices has

Answer (Please select your correct option)

exactly $n+1$ edges

exactly $n-1$ edges

exactly $2n+1$ edges

exactly $2n-1$ edges

correct answer
solved by hadi

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Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

G^T for the digraph can be computed in

Answer (Please select your correct option)

- $\mathcal{O}(VE)$
- $\mathcal{O}(V \log E)$
- $\mathcal{O}(E \log V)$
- $\mathcal{O}(V+E)$

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 26 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

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 answer
solved by hadi

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

Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

The running time of the Dijkstra's algorithm is _____

Answer (Please select your correct option)

$\Theta(E \log V)$

correct answer
solved by hadi

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$\Theta(E)$

$\Theta(\log V)$

$\Theta(EV^2)$

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Question No : 28 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

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

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 29 of 52

Marks: 1 (Budgeted Time 1 Min)

Floyd-Warshall algorithm dates back to the early _____.

Answer (Please select your correct option)

70's



90's



60's



50's



correct answer
solved by hadi

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Question No : 30 of 52

Marks: 1 (Budgeted Time 1 Min)

Running time of Floyd-Warshall algorithm is

Answer (Please select your correct option)

$\Theta(n^2)$

$\Theta(n^4)$

$\Theta(n^3)$

$\Theta(3^n)$

correct answer
solved by hadi

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Question No : 31 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

NP-Class

correct answer
solved by hadi

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Co-Prime Class

P-Class

Both P and NP Classes

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

Answer (Please select your correct option)

Co-NP Class

NP-prime class

P-Class

NP -Class

correct answer
solved by hadi

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Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

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

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

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Question No : 34 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

NP and NP-hard

correct answer
solved by hadi

Correct Answer solved by hadi
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NP not necessarily NP-Hard

NP-hard means it is NP complete as well

in P and NP

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Question No : 35 of 52

Marks: 1 (Budgeted Time 1 Min)

Clique cover problem arises in applications of _____.

Answer (Please select your correct option)

Map drawing

Clustering

correct answer
solved by hadi

Architectural design

Clique

Made by: Waqar Siddhu

Question No : 36 of 52

Marks: 1 (Budgeted Time 1 Min)

Sieve Technique can be applied to solve _____

Answer (Please select your correct option)

Selection problems

correct answer
solved by hadi

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Arguement problems

Dynamic problems

Greedy problems

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Which type of instructions Random Access Machine (RAM) can execute? Choose best answer

Answer (Please select your correct option)

Algebraic and logic

Geometric and arithmetic

Arithmetic and logic

Parallel and recursive

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 38 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman encoding algorithm is a _____

Answer (Please select your correct option)

Dynamic and greedy algorithm

Divide and conquer and greedy algorithm

Geedy algorithm.

correct answer
solved by hadi

Correct Answer solved by hadi
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Dynamic programming algorithm

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Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Dynamic programming

Brute Force

Greedy

Divide and conquer

Made by: Waqar Siddhu

Question No : 40 of 52

Marks: 1 (Budgeted Time 1 Min)

Which traversal technique is look like propagating wave-front outward

Answer (Please select your correct option)

Generic Traversal

Breadth First Traversal

Depth First Traversal

Time Stamp Traversal

Correct Answer solved by hadi
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Right

Made by: Waqar Siddhu

Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

Answer yes or no and give a brief explanation for your choice.
Every problem in NP is NP-complete

Answer (Please [click here](#) to Add Answer)



Made by: Waqar Siddhu

Question No : 42 of 52

Marks: 2 (Budgeted Time 4 Min)

Consider the case of 3 matrices: A1 is 5×4 , A2 is 4×6 and A3 is 6×2 . If the multiplication can be carried out this way $((A_1A_2) A_3)$ then find out the cost.

Answer (Please [click here](#) to Add Answer)



Made by: Waqar Siddhu

Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

If we implement the bag data structure by using a stack, then which type of traversal it will be?

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Question No : 44 of 52

Marks: 2 (Budgeted Time 4 Min)

What is the greedy thing to do in Dijkstra's algorithm?

Answer (Please [click here](#) to Add Answer)



Made by: Waqar Siddhu

Question No : 45 of 52

Marks: 3 (Budgeted Time 6 Min)

How the Kruskal's algorithm works?

Answer (Please [click here](#) to Add Answer)



Made by: Waqar Siddhu

Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

Suppose you are given an integer array and asked to find the median in that array, suggest two techniques, one having the complexity $O(n \log n)$ and the other having linear time i.e. $O(n)$.

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Let A is the adjacency matrix of an undirected graph given below.
Does this matrix represent a complete graph?
What general property of the matrix indicates that the graph is complete?

| | a | b | c | d | e | f |
|---|---|---|---|---|---|---|
| a | 1 | 1 | 1 | 0 | 1 | 0 |
| b | 1 | 0 | 0 | 1 | 0 | 0 |

Answer (Please [click here](#) to Add Answer)



A rich text editor toolbar with various icons for text formatting and editing. It includes options for bold, italic, underline, text color, background color, bulleted list, numbered list, and indent. The font is set to Arial and the size is 12. The zoom level is set to 100%.

Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

What do you mean by polynomial time algorithm? Explain what kind of problem can be solved by using polynomial time algorithm?

Answer (Please [click here](#) to Add Answer)



Made by: Waqar Siddhu

Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

Suppose you could reduce an NP-complete problem to a polynomial time problem in polynomial time. What would be the consequence?

Answer (Please [click here](#) to Add Answer)



Made by: Waqar Siddhu

Develop the time analysis series of the following pseudo code and then give the asymptotic notation of your developed time sequence .

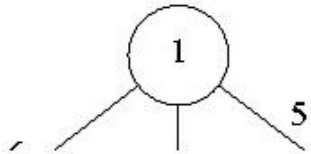
```
for (i=1; i<=n; i=i*7)
{
    for (j=1; j<=7n; ++j)
    {
        for(k=n; k>1; k=k-5)
        {
```

Answer (Please [click here](#) to Add Answer)



Made by: Waqar Siddhu

Apply Prim's algorithms on the following graph. [You can show final result in exam software and need not to show all intermediate steps].



Answer (Please [click here](#) to Add Answer)



Made by: Waqar Siddhu

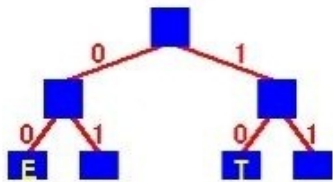
Write the pseudo code for Depth-first Search algorithm in Graphs with recursive version.

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Consider the following Huffman Tree



Answer (Please select your correct option)

10 00 010

correct answer
solved by hadi

Correct Answer solved by hadi
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011 00 010

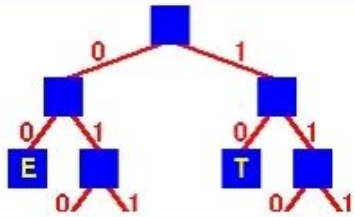
10 00 110

11 10 110

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Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)

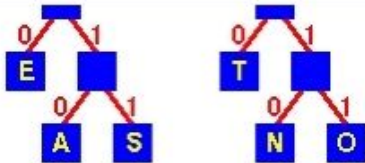
10 00 010

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)

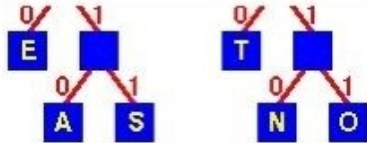
10 00 010

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)

10 00 010

correct answer
solved by hadi

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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)

- Lists require less space than *matrices* but take longer to find the weight of an edge $(v1,v2)$ correct answer
solved by hadi
- Lists require less space than *matrices* and they are faster to find the weight of an edge $(v1,v2)$
- Lists require more space than *matrices* and they take longer to find the weight of an edge $(v1,v2)$
- Lists require more space than *matrices* but are faster to find the weight of an edge $(v1,v2)$

Made by: Waqar Siddhu

Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

- v edges.
- $v - e + 5$ edges
- $v + e$ edges.
- None of these

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman algorithm finds a (n) _____ solution.

Answer (Please select your correct option)

Optimal

correct answer
solved by hadi

Correct Answer solved by hadi
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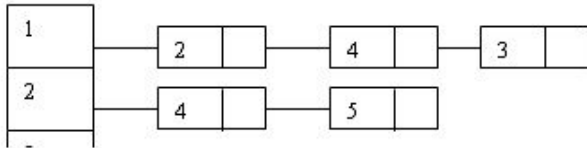
Non-optimal

Exponential

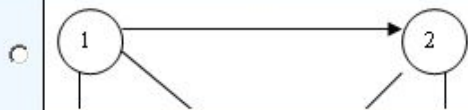
Polynomial

Made by: Waqar Siddhu

Consider the following adjacency list:



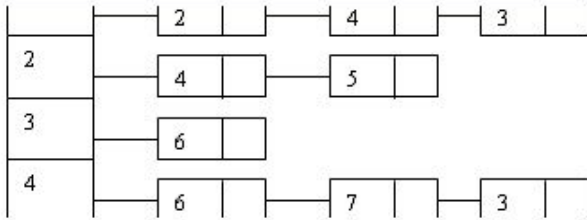
Answer (Please select your correct option)



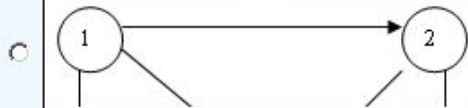
Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)



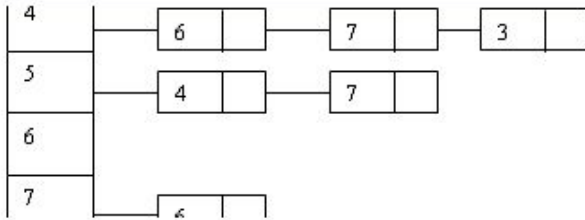
Answer (Please select your correct option)



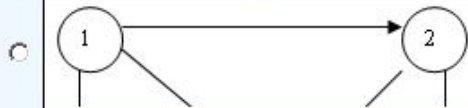
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Question No : 5 of 52

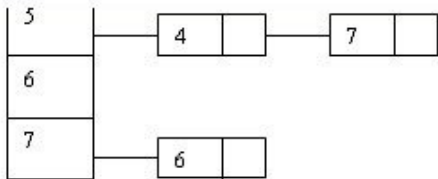
Marks: 1 (Budgeted Time 1 Min)



Answer (Please select your correct option)



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

Answer (Please select your correct option)



correct answer
solved by hadi

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_____ is a graphical representation of an algorithm

Answer (Please select your correct option)

Σ notation

Θ notation

Flowchart

Asymptotic notation

correct answer
solved by hadi

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Question No : 7 of 52

Marks: 1 (Budgeted Time 1 Min)

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

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

Answer (Please select your correct option)

- | | | | |
|-----------------------|--|----------------------------------|-------------|
| <input type="radio"/> | $\{(7,13), (12,12), (14,10), (15,7)\}$ | correct answer solved by hadi | not confirm |
| <input type="radio"/> | $\{(7,7), (7,13), (9,10), (11,5), (14,10)\}$ | | |
| <input type="radio"/> | $\{(2,5), (4,4), (4,11), (5,1), (14,10)\}$ | | |
| <input type="radio"/> | $\{(4,4), (4,11), (7,13), (9,10), (14,10)\}$ | | |

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Question No : 8 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

25

75

79

70

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Question No : 9 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

It will take $\Theta(1)$

correct answer
solved by hadi

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Time will vary according to the nature of input data

It can not be predicted

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

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Question No : 10 of 52

Marks: 1 (Budgeted Time 1 Min)

Who invented Quick sort procedure?

Answer (Please select your correct option)

- Hoare correct answer
solved by hadi
- Sedgewick
- Mellroy
- Coreman

Made by: Waqar Siddhu

Question No : 11 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Small Integers

correct answer
solved by hadi

Small characters

Floats

None of these

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Question No : 12 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Fully parenthesized

Partially parenthesized

Not parenthesized

None of the options

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Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

Maximum number of edges in a Directed Graph may be

Answer (Please select your correct option)

V

2V

Approximatly $|V|^2$

\sqrt{V}

correct answer
solved by hadi

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

Answer (Please select your correct option)

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 answer
solved by hadi

Made by: Waqar Siddhu

Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman Coding uses

Answer (Please select your correct option)

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

correct answer
solved by hadi

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Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

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

correct answer
solved by hadi

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A Hamiltonian cycle is a cycle

Answer (Please select your correct option)

that visits every vertex in the graph exactly once

correct answer
solved by hadi

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that visits both vertex and edge exactly once

that visits all vertices without any constraint

that visits every edge in the graph exactly once

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Question No : 18 of 52

Marks: 1 (Budgeted Time 1 Min)

In generic graph traversal algorithm we

Answer (Please select your correct option)

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

correct answer
solved by hadi

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Question No : 19 of 52

Marks: 1 (Budgeted Time 1 Min)

In time stamp traversal we can calculate

Answer (Please select your correct option)

- | | | | |
|-----------------------|--|----------------------------------|---|
| <input type="radio"/> | whether the graph has Cycles | correct answer solved by hadi | Correct Answer solved by hadi email : usmanraj20@gmail.com Cell : 03228043306 |
| <input type="radio"/> | total number of cycles on the bases of forward edges | | |
| <input type="radio"/> | total number of cycles on the bases if back edges | | |
| <input type="radio"/> | total no of paths of certain length | | |

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Question No : 20 of 52

Marks: 1 (Budgeted Time 1 Min)

Precedence constraint graph is

Answer (Please select your correct option)

non acyclic directed graph

acyclic undirected graph

non acyclic undirected graph

acyclic directed graph

correct answer
solved by hadi

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

Answer (Please select your correct option)

- | | | | |
|-----------------------|---|----------------------------------|----------|
| <input type="radio"/> | the length of the shortest path from vertex v to the vertex u | correct answer solved by hadi | not sure |
| <input type="radio"/> | the length of the shortest edge from vertex v to points already in the tree | | |
| <input type="radio"/> | the dynamic programming rules | | |
| <input type="radio"/> | the information about all adjacent vertices | | |

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Bellman Ford algorithm is for the

Answer (Please select your correct option)

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

single source shortest path finding problem and does allow negative edges

correct answer
solved by hadi

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

Answer (Please select your correct option)

- 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
- It will work on any weighted graph with positive weights
- The running time of Bellman - Ford Algorithm is greater than Dijkstra's algorithm

correct answer
solved by hadi

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Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

Kruskal's Algorithm is used for

Answer (Please select your correct option)

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

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

Dijkstra's algorithm is used for

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 answer
solved by hadi

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Kruskal's Algorithm has time complexity

Answer (Please select your correct option)

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

correct answer
solved by hadi

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

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Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

Bellman Ford algorithm applies relaxation to every

Answer (Please select your correct option)

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

correct answer
solved by hadi

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Question No : 28 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- 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

Right,,, by
concept

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Question No : 29 of 52

Marks: 1 (Budgeted Time 1 Min)

In NP-problems "NP" represents

Answer (Please select your correct option)

Non-deterministic Polynomials

correct answer
solved by hadi

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Null-polynomials

Negative Polynomials

Non-polynomials

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Question No : 30 of 52

Marks: 1 (Budgeted Time 1 Min)

Floyd-Warshall algorithm dates back to the early _____.

Answer (Please select your correct option)

70's

90's

60's

50's

correct answer
solved by hadi

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Question No : 31 of 52

Marks: 1 (Budgeted Time 1 Min)

Space used by Floyd-Warshall algorithm is

Answer (Please select your correct option)

$\Theta(n^4)$

$\Theta(n^3)$

$\Theta(n^2)$

$\Theta(2^n)$

correct answer
solved by hadi

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Question No : 32 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Apart from

Far from

Near to

Adjacent to

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

Polynomial time certificates

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

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

Answer (Please select your correct option)

$O(\log n)$

$O(n)$

correct answer
solved by hadi

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$O(n \log n)$

$O(n^2)$

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Question No : 35 of 52

Marks: 1 (Budgeted Time 1 Min)

If a pseudo code is memory wise efficient then

Answer (Please select your correct option)

- 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 vise versa is not true.
- It may be memory wise efficient but not necessary

correct answer
solved by hadi

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)

- The array elements form a heap
- Elements in each half of the array are sorted amongst themselves
- 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

correct answer
solved by hadi

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Search techniques of various algorithms look at ____

Answer (Please select your correct option)

Many possible solutions

correct answer
solved by hadi

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Maximum 2 possible solutions

Minimum 2 possible solutions

Sorting solutions

Made by: Waqar Siddhu

Question No : 38 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

9 bits

16 bits

8 bits

correct answer
solved by hadi

32 bits

Made by: Waqar Siddhu

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman encoding algorithm is a _____

Answer (Please select your correct option)

Dynamic and greedy algorithm

Divide and conquer and greedy algorithm

Geedy algorithm.

Dynamic programming algorithm

correct answer
solved by hadi

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Question No : 40 of 52

Marks: 1 (Budgeted Time 1 Min)

Breadth first search is shortest path algorithm that works

Answer (Please select your correct option)

on un-weighted graphs

correct answer
solved by hadi

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on weighted graphs

on both weighted and un-weighted graphs

BFS cannot be used for shortest path problems

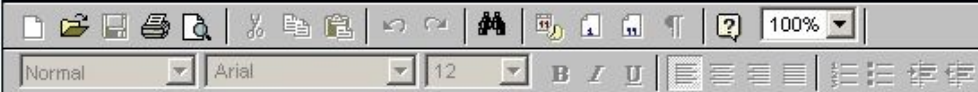
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Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

What is heap and heap order?

Answer ([Please click here to Add Answer](#))



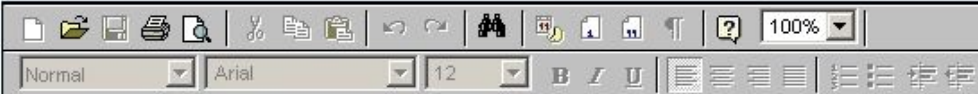
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Question No : 42 of 52

Marks: 2 (Budgeted Time 4 Min)

Define free tree.

Answer ([Please click here to Add Answer](#))




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The following adjacency matrix represents a graph that consists of four vertices labeled 0, 1, 2 and 3. The entries in the matrix indicate edge weights.

| | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 3 |
| 1 | 2 | 0 | 4 | 0 |
| 2 | 0 | 1 | 0 | 1 |
| 3 | 2 | 0 | 0 | 0 |

Answer the following question:

Answer ([Please click here to Add Answer](#))



A rich text editor toolbar with various icons for text formatting and editing. The toolbar includes options for font style (Normal), font face (Arial), font size (12), bold (B), italic (I), underline (U), bulleted list, numbered list, indent, and outdent. A zoom level of 100% is also displayed.

Made by: Waqar Siddhu

| | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 3 |
| 1 | 2 | 0 | 4 | 0 |
| 2 | 0 | 1 | 0 | 1 |
| 3 | 2 | 0 | 0 | 0 |

Answer the following question:

Can an adjacency matrix for a directed graph ever *not* be square in shape? Why or why not?

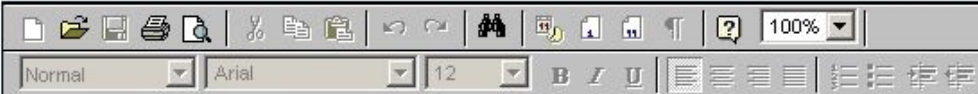
Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Where clique cover problem arises?

Answer ([Please click here to Add Answer](#))



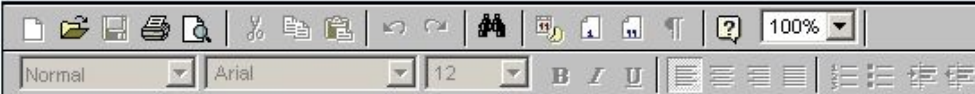
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Question No : 45 of 52

Marks: 3 (Budgeted Time 6 Min)

Consider a digraph $G = (V, E)$ and any DFS forest for G . Prove that G has a cycle if and only if the DFS forest has a back edge.

Answer ([Please click here to Add Answer](#))



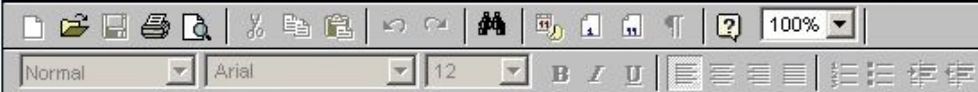
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Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

Describe three asymptotic notations.

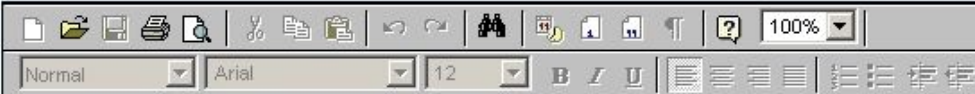
Answer ([Please click here to Add Answer](#))



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Briefly discuss at least three variants of the shortest path problem.

Answer ([Please click here to Add Answer](#))



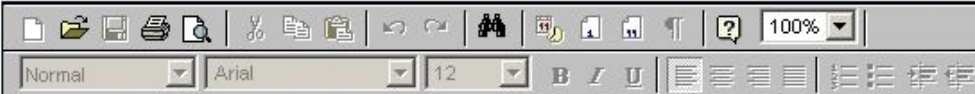
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Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

What do you mean by polynomial time algorithm? Explain what kind of problem can be solved by using polynomial time algorithm?

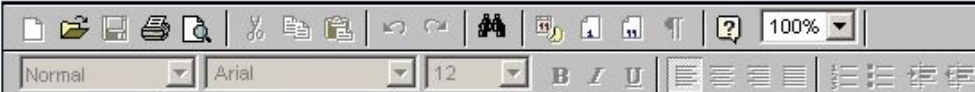
Answer ([Please click here to Add Answer](#))



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Suppose you could reduce an NP-complete problem to a polynomial time problem in polynomial time. What would be the consequence?

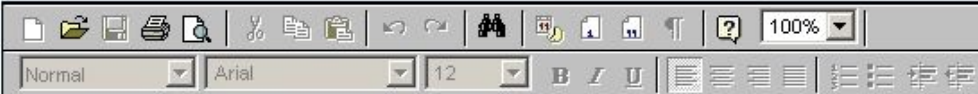
Answer ([Please click here to Add Answer](#))



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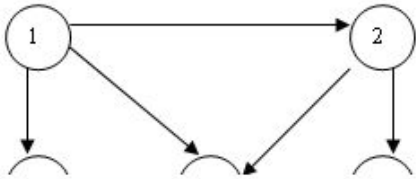
According to Dijkstra's Algorithm, write the pseudo code to relax a vertex.

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

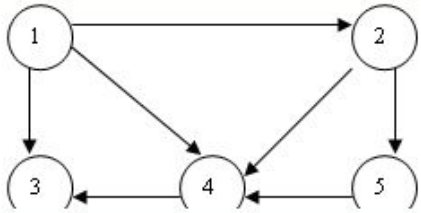
Find the adjacent list for the following graph



Answer ([Please click here to Add Answer](#))



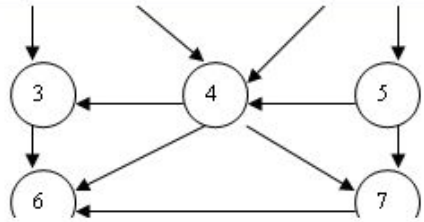
Made by: Waqar Siddhu



Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for file operations, editing, and formatting. The text area below is empty.

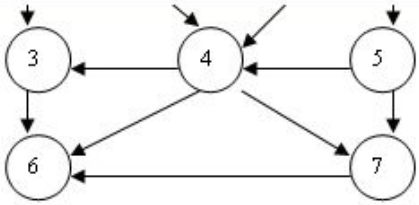
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Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for file operations, editing, and formatting. The text area below is empty.

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Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for file operations, editing, and formatting. The text area below is empty.

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Question No : 52 of 52

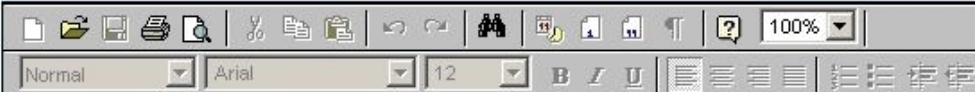
Marks: 5 (Budgeted Time 10 Min)

Draw the final **Max-Heap** structure for the following array,

50, 31, 45, 30, 2, 7, 40, 12, 28, 1

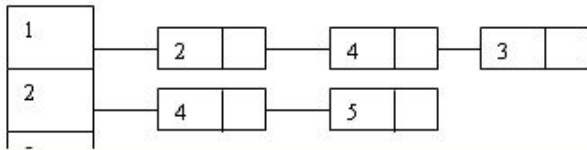
You can show the final result (tree) only.

Answer ([Please click here to Add Answer](#))

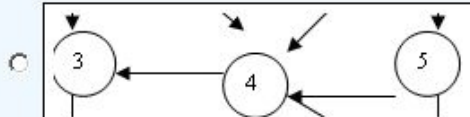
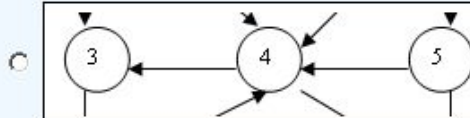
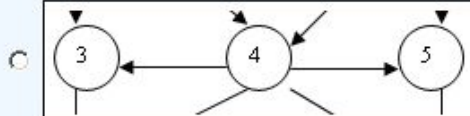
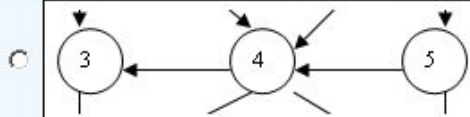


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Consider the following adjacency list:

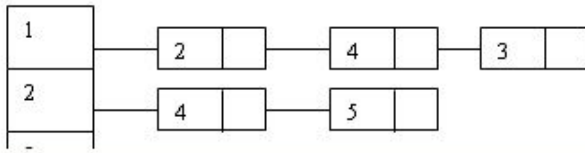


Answer (Please select your correct option)

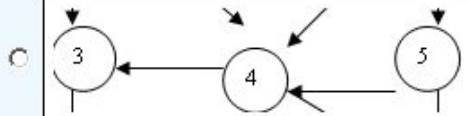
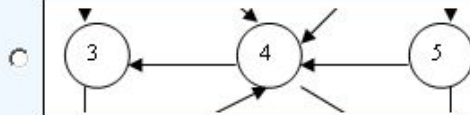
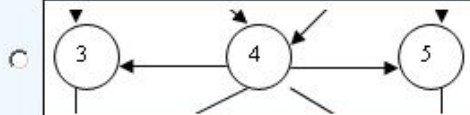


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Consider the following adjacency list:

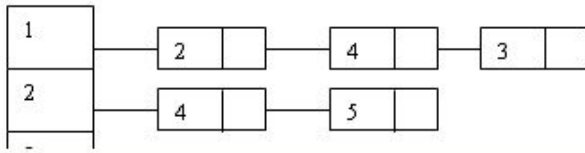


Answer (Please select your correct option)

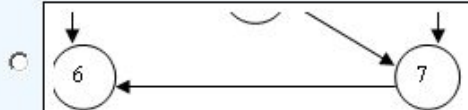
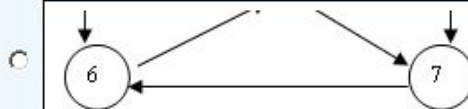


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Consider the following adjacency list:



Answer (Please select your correct option)



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Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

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

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 2 of 52

Marks: 1 (Budgeted Time 1 Min)

Non-optimal or greedy algorithm for money change takes _____

Answer (Please select your correct option)

$O(kN)$

$O(2^k)$

$O(N)$

$O(k)$

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman algorithm finds a (n) _____ solution.

Answer (Please select your correct option)

Optimal

correct answer
solved by hadi

Correct Answer solved by hadi
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Non-optimal

Exponential

Polynomial

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Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

- 80 correct answer
solved by hadi
- 160
- 320
- 100

Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

- 8 bits
- 80 bits
- Less than 50 bits
- More than 50 bits

correct answer
solved by hadi

Correct Answer solved by hadi
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Made by: Waqar Siddhu

Question No : 6 of 52

Marks: 1 (Budgeted Time 1 Min)

Random access machine or RAM is a/an

Answer (Please select your correct option)

Machine build by Al-Khwarizmi

Mechanical machine

Electronics machine

Mathematical model

correct answer
solved by hadi

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)

C++ program

Java program

Pseudo program

Mathematical model of computation

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 8 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Sub problems

correct answer
solved by hadi

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Selection

pivot

Sieve

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Question No : 9 of 52

Marks: 1 (Budgeted Time 1 Min)

Quick sort procedure was invented by

Answer (Please select your correct option)

- Hoare correct answer
solved by hadi
- Sedgewick
- Mellroy
- Coreman

Made by: Waqar Siddhu

Question No : 10 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Linked list

correct answer
solved by hadi

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Heap

Hash table

Stack

Made by: Waqar Siddhu

Question No : 11 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

two dimensional

three dimensional

n dimensional

additional

correct answer
solved by hadi

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)

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

correct answer
solved by hadi

Correct Answer solved by hadi
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$C[i, j] = \sum_{k=1}^q A[k, i]B[k, j]$

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

None of these

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Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

Five

Four

Three

correct answer
solved by hadi

Two

Made by: Waqar Siddhu

Question No : 14 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

n^2 correct answer
solved by hadi

Correct Answer solved by hadi
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$n^{\frac{n}{2}}$

n

n^8

Made by: Waqar Siddhu

Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

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 answer
solved by hadi

Made by: Waqar Siddhu

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman algorithm finds

Answer (Please select your correct option)

sometime optimal some time non optimal solution

space wise optimal and time wise non optimal solution

a non-optimal solution

an optimal solution

correct answer
solved by hadi

Made by: Waqar Siddhu

The Huffman algorithm time complexity

Answer (Please select your correct option)

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

correct answer
solved by hadi

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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)

- 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

correct answer
solved by hadi

Made by: Waqar Siddhu

Using Huffman encoding technique the string "abc" will take

Answer (Please select your correct option)

5 bits

6 bits

24 bits

12 bits

correct answer
solved by hadi

Correct Answer solved by hadi
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Made by: Waqar Siddhu

Question No : 20 of 52

Marks: 1 (Budgeted Time 1 Min)

Using Huffman encoding technique the string "a@a" will be encoded with _____ bits

Answer (Please select your correct option)

5

6

8

Huffman encoding fail at this string

correct answer
solved by hadi

Made by: Waqar Siddhu

In fractional knapsack we sort the

Answer (Please select your correct option)

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

correct answer
solved by hadi

Correct Answer solved by hadi
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Made by: Waqar Siddhu

In generic graph traversal algorithm we

Answer (Please select your correct option)

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

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 23 of 52

Marks: 1 (Budgeted Time 1 Min)

In time stamp traversal we can calculate

Answer (Please select your correct option)

whether the graph has Cycles

correct answer
solved by hadi

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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

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Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

when the graph has relatively few edges

Answer (Please select your correct option)

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

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

Kruskal's algorithm

Answer (Please select your correct option)

- 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

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 26 of 52

Marks: 1 (Budgeted Time 1 Min)

In Prim's algorithm we use

Answer (Please select your correct option)

Queue data structure

Priority Queue data structure

Stack data structure

Both stack and Queue data structures

correct answer
solved by hadi

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Adding any edge to a free tree

Answer (Please select your correct option)

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

creates a unique cycle

correct answer
solved by hadi

it is not allowed to add the edge in free tree

creates multiple cycles

Made by: Waqar Siddhu

Question No : 28 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

no weight assigned to it

by default weight of one unit

its own different keys of weights

there are no such type of graphs in theory

correct answer
solved by hadi

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Kruskal's Algorithm is used for

Answer (Please select your correct option)

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

right

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Kruskal's Algorithm has time complexity

Answer (Please select your correct option)

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

correct answer
solved by hadi

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

Question No : 31 of 52

Marks: 1 (Budgeted Time 1 Min)

Bellman Ford algorithm applies relaxation to every

Answer (Please select your correct option)

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

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 32 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Non-Deterministic Polynomial class

Deterministic Polynomial class

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

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correct answer
solved by hadi

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

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Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

In NP-problems "NP" represents

Answer (Please select your correct option)

- Non-deterministic Polynomials correct answer
solved by hadi
- Null-polynomials
- Negative Polynomials
- Non-polynomials

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Question No : 34 of 52

Marks: 1 (Budgeted Time 1 Min)

Space used by Floyd-Warshall algorithm is

Answer (Please select your correct option)

$\Theta(n^4)$

$\Theta(n^3)$

$\Theta(n^2)$

$\Theta(2^n)$

correct answer
solved by hadi

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Question No : 35 of 52

Marks: 1 (Budgeted Time 1 Min)

If a problem is NP-complete

Answer (Please select your correct option)

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

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 36 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

NP and NP-hard

correct answer
solved by hadi

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NP not necessarily NP-Hard

NP-hard means it is NP complete as well

in P and NP

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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)

Apart from

Far from

Near to

Adjacent to

correct answer
solved by hadi

Made by: Waqar Siddhu

Algorithm's essential elements are

Answer (Please select your correct option)

- | | | | |
|-----------------------|---|----------------------------------|-------------------------------------|
| <input type="radio"/> | Step wise solution | correct answer solved by hadi | i think right because in algo we |
| <input type="radio"/> | Stepwise solution and finite time | | solve problem step wise |
| <input type="radio"/> | Step wise solution finite inputs | | |
| <input type="radio"/> | Stepwise approach in which time and memory does not matter. | | |

Made by: Waqar Siddhu

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

Search techniques of various algorithms look at _____

Answer (Please select your correct option)

Many possible solutions

correct answer
solved by hadi

Maximum 2 possible solutions

Minimum 2 possible solutions

Sorting solutions

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Question No : 40 of 52

Marks: 1 (Budgeted Time 1 Min)

Which traversal technique is look like propagating wave-front outward

Answer (Please select your correct option)

Generic Traversal

Breadth First Traversal

Depth First Traversal

Time Stamp Traversal

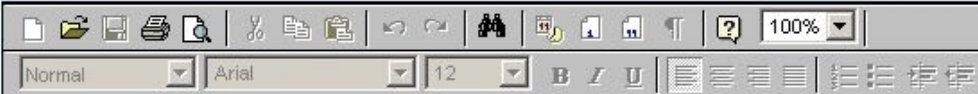
correct answer
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In strong components problem what complete refers to?

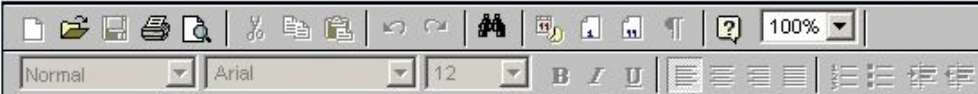
Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

What are quadratic series?

Answer ([Please click here to Add Answer](#))



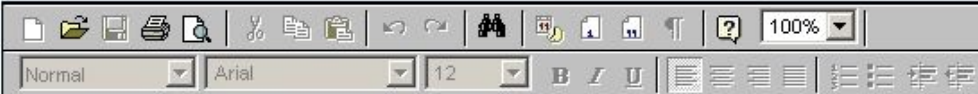
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Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

What is overall time for Kruskal's algorithm if the graph is sparse?

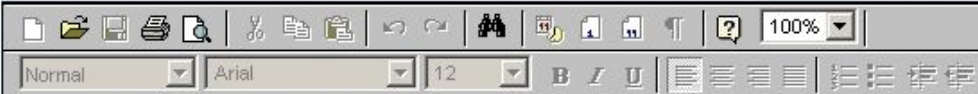
Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

When a problem is called a decision problem?

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Formally describe Minimum Spanning Trees Problem.

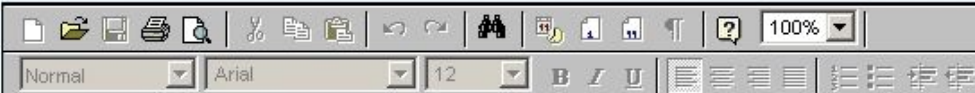
Answer ([Please click here to Add Answer](#))



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True or false: A sequence of values in a column of the dynamic programming table for an instance of the knapsack problem is always non-decreasing? Give a brief description.

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

You are given the task of laying down new railway line between Peshawar and Karachi. There are n intermediate cities that can be used and you know the cost of laying track between any pair of these cities. Your goal is to spend the least total amount of track to construct the railway line. How would you determine the least amount of track and the cities to go through? Name the best algorithm which addresses the above problem.

Answer ([Please click here to Add Answer](#))



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You are given the task of laying down new railway lines which will connect all n cities. Thus for any pair of cities, you will end up with track connecting them. Note that two routes may share the same track; track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Agorithm

Answer ([Please click here to Add Answer](#))



The image shows a rich text editor toolbar with various icons for text formatting and editing. The toolbar includes icons for bold, italic, underline, text color, background color, bulleted list, numbered list, link, unlink, and other text manipulation tools. The font is set to Arial, size 12, and the text color is black. The background color is white. The toolbar is located at the top of the editor area.

Made by: Waqar Siddhu

Following is not the minimum spanning tree convert it into MST. [You can show final result in exam software and need not to show all intermediate steps].



Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

There are given two main connecting or railway lines which are connected with each other. There are two parts of track, for the one part of track, you can travel in only one direction. There are other two parts of track, track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Algorithm
- 4 Bellman Ford Algorithm.

Answer ([Please click here to Add Answer](#))



Normal Arial 12 B I U

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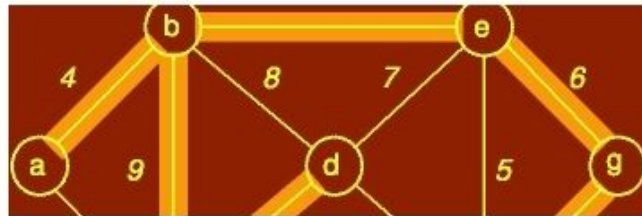
Following is not the minimum spanning tree convert it into MST. [You can show final result in exam software and need not to show all intermediate steps].



Answer ([Please click here to Add Answer](#))



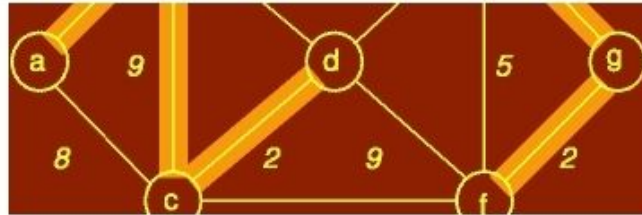
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Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for undo, redo, bold, italic, underline, list, link, unlink, and a 100% zoom level. Below the icons, the text "Normal" is selected in a dropdown menu, followed by "Arial" in another dropdown, and "12" in a third dropdown. To the right are icons for bold (B), italic (I), and underline (U).

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Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for undo, redo, bold, italic, underline, list, link, unlink, and a 100% zoom level.

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Answer ([Please click here to Add Answer](#))

Rich text editor toolbar with icons for undo, redo, bold, italic, underline, list, link, unlink, and a 100% zoom level.

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Consider the following recursive search function which returns the index of the array element containing key, if such an element exists. Find out what is the complexity of search and show your work.

```
int search( int* array, int left, int right, int key){
    int mid = (left + right)/2;
    if( left == right )
        return left;
```

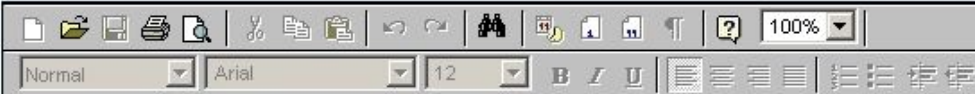
Answer ([Please click here to Add Answer](#))



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```
return left;
else if( array[mid] <= key )
    return search( array, mid+1, right, key );
else
    return search( array, left, mid, key );
}
```

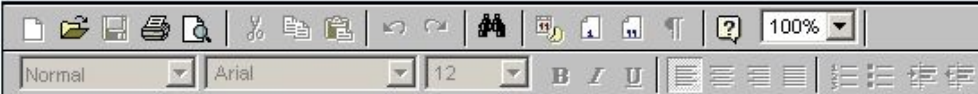
Answer ([Please click here to Add Answer](#))



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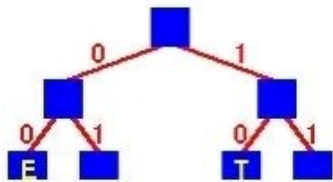
Write pseudo code for the algorithm, if we implement the bag of knapsack by using a stack.

Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Consider the following Huffman Tree



Answer (Please select your correct option)

10 00 010

correct answer
solved by hadi

Correct Answer solved by hadi
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011 00 010

10 00 110

11 10 110

Made by: Waqar Siddhu

Question No : 2 of 52

Marks: 1 (Budgeted Time 1 Min)

Total running time of BFS is

Answer (Please select your correct option)

$O(V + E)$

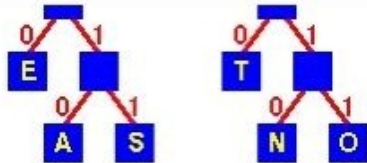
correct answer
solved by hadi

$O(V - E)$

$O(VE)$

None of these

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The binary code for the string "TEA" is

Answer (Please select your correct option)

10 00 010

correct answer
solved by hadi

011 00 010

10 00 110

11 10 110

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Question No : 2 of 52

Marks: 1 (Budgeted Time 1 Min)

Total running time of BFS is

Answer (Please select your correct option)

$O(V + E)$

correct answer
solved by hadi

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$O(V - E)$

$O(VE)$

None of these

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Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

80

correct answer
solved by hadi

160

320

100

Made by: Waqar Siddhu

Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

8 bits

80 bits

Less than 50 bits

More than 50 bits

correct answer
solved by hadi

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Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

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

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

$\Theta(15n^2)$

but check

correct answer
solved by hadi

$\Theta(n^3)$

Made by: Waqar Siddhu

Question No : 6 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

divide-and-conquer

correct answer
solved by hadi

decrease and conquer

greedy nature

2-dimension Maxima

Made by: Waqar Siddhu

Question No : 7 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

- | | | | |
|-----------------------|----------|----------------------------------|---|
| <input type="radio"/> | n items | correct answer solved by hadi | Correct Answer solved by hadi email : usmanraj20@gmail.com Cell : 03228043306 |
| <input type="radio"/> | phases | | |
| <input type="radio"/> | pointers | | |
| <input type="radio"/> | constant | | |

Made by: Waqar Siddhu

Question No : 8 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

(log n) order

increasing order only

decreasing order only

heap order

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 9 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

All are in-place algorithms

correct answer
solved by hadi

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All are stable algorithms

None of these

All are unstable algorithms

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Question No : 10 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

two dimensional

three dimensional

n dimensional

additional

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 11 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

Small Integers

correct answer
solved by hadi

Small characters

Floats

None of these

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

Answer (Please select your correct option)

$\Phi = 1.618$

correct answer
solved by hadi

Correct Answer solved by hadi
email : usmanraj20@gmail.com
Cell : 03228043306

$\Phi = 3.142$

$\Phi = 1.816$

$\Phi = 1.168$

Made by: Waqar Siddhu

Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

Maximum number of edges in a Directed Graph may be

Answer (Please select your correct option)

V

2V

Approximately $|V|^2$

\sqrt{V}

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 14 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman algorithm finds

Answer (Please select your correct option)

- sometime optimal some time non optimal solution
- space wise optimal and time wise non optimal solution
- a non-optimal solution
- an optimal solution

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

The Huffman codes provide a method of encoding data which

Answer (Please select your correct option)

- is efficient and use a variable length codes
- is efficient and use fixed length codes i.e. ASCII
- is efficient and both ways of variable and fixed length codes can be used
- is efficient time wise but not space wise

correct answer
solved by hadi

Correct Answer solved by hadi
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Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

10

16

32

8

correct answer
solved by hadi

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In fractional knapsack we sort the

Answer (Please select your correct option)

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

right

Correct Answer solved by hadi
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The greedy part of the Huffman encoding algorithm is to first find two nodes with _____ frequency.

Answer (Please select your correct option)

Larger

Smallest

correct answer
solved by hadi

Balance

Character

Made by: Waqar Siddhu

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

Answer (Please select your correct option)

Sum of out-degrees of all the vertices

Sum of in-degrees of all the vertices

but check it

correct answer
solved by hadi

First both are true

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

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

Answer (Please select your correct option)

that no codeword is the prefix of any other

correct answer
solved by hadi

Correct Answer solved by hadi
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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

Question No : 21 of 52

Marks: 1 (Budgeted Time 1 Min)

In undirected graphs there

Answer (Please select your correct option)

are no Cross edges but have forward and back edges

are only forward edges

is convention of only back edges

is convention of forward edges

correct answer
solved by hadi

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In time stamp traversal we can calculate

Answer (Please select your correct option)

- | | | | |
|-----------------------|--|--|--|
| <input type="radio"/> | whether the graph has Cycles | correct answer solved by hadi | Correct Answer solved by hadi email : usmanraj20@gmail.com Cell : 03228043306 |
| <input type="radio"/> | total number of cycles on the bases of forward edges | | |
| <input type="radio"/> | total number of cycles on the bases if back edges | | |
| <input type="radio"/> | total no of paths of certain length | | |

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Question No : 23 of 52

Marks: 1 (Budgeted Time 1 Min)

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

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 answer
solved by hadi

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Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

Precedence constraint graph is

Answer (Please select your correct option)

non acyclic directed graph

acyclic undirected graph

non acyclic undirected graph

acyclic directed graph

correct answer
solved by hadi

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

Answer (Please select your correct option)

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

correct answer
solved by hadi

Correct Answer solved by hadi
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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

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In strongly connected components the component digraph is

Answer (Please select your correct option)

necessarily cyclic

correct answer
solved by hadi

necessarily acyclic

not necessary it can be both cyclic and acyclic

cyclic with some other constraints

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Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

Floyd-Warshall algorithm is

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 answer
solved by hadi

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Question No : 28 of 52

Marks: 1 (Budgeted Time 1 Min)

Dijkstra's algorithm is used for

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 answer
solved by hadi

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Kruskal's Algorithm has time complexity

Answer (Please select your correct option)

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

correct answer
solved by hadi

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Bellman Ford algorithm applies relaxation to every

Answer (Please select your correct option)

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

correct answer
solved by hadi

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

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Question No : 31 of 52

Marks: 1 (Budgeted Time 1 Min)

In NP-problems "NP" represents

Answer (Please select your correct option)

Non-deterministic Polynomials

correct answer
solved by hadi

Correct Answer solved by hadi
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Null-polynomials

Negative Polynomials

Non-polynomials

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

Answer (Please select your correct option)

- P-Class
- NP-Class
- Co-NP Class
- Unpredictable class

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Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

NP-Class

check

correct answer
solved by hadi

Co-Prime Class

P-Class

Both P and NP Classes

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Question No : 34 of 52

Marks: 1 (Budgeted Time 1 Min)

3-color problem is known as _____

Answer (Please select your correct option)

P

NPC

correct answer
solved by hadi

Co-NP

P and NP

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

Answer (Please select your correct option)

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

correct answer
solved by hadi

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

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Question No : 36 of 52

Marks: 1 (Budgeted Time 1 Min)

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)

Apart from

Far from

Near to

Adjacent to

correct answer
solved by hadi

Made by: Waqar Siddhu

Question No : 37 of 52

Marks: 1 (Budgeted Time 1 Min)

Sieve Technique can be applied to solve _____

Answer (Please select your correct option)

Selection problems

correct answer
solved by hadi

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Arguement problems

Dynamic problems

Greedy problems

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Question No : 38 of 52

Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

$O(\log_2 n)$

no idea
but i think option

$O(n)$

(B)

$O(3 + 1 + 3)$

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

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Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

Search techniques of various algorithms look at _____

Answer (Please select your correct option)

Many possible solutions

correct answer
solved by hadi

Maximum 2 possible solutions

Minimum 2 possible solutions

Sorting solutions

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

Answer (Please select your correct option)

Dynamic programming

Brute Force

by concept

correct answer
solved by hadi

Greedy

Divide and conquer

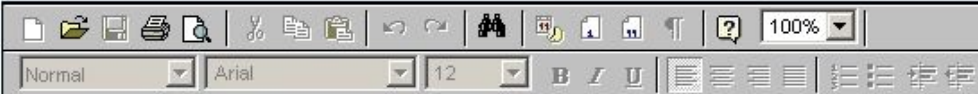
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Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

How we Heapify?

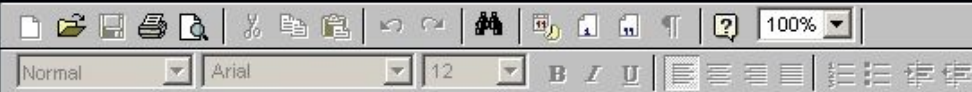
Answer ([Please click here to Add Answer](#))



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Define Back Edge

Answer ([Please click here to Add Answer](#))



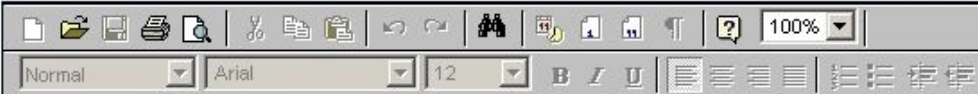
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Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

Given an adjacency list for G , what is the time complexity to compute G^T ?

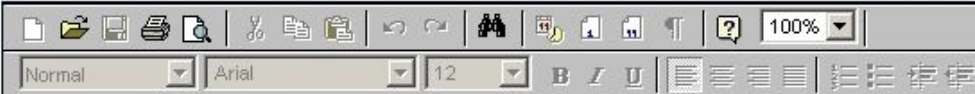
Answer ([Please click here to Add Answer](#))



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What is Bellman-Ford algorithm's running time?

Answer ([Please click here to Add Answer](#))



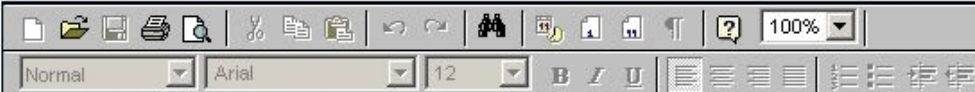
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Question No : 45 of 52

Marks: 3 (Budgeted Time 6 Min)

Given a digraph $G = (V, E)$, consider any DFS forest of G and consider any edge $(u, v) \in E$. Prove that if this edge is a tree, forward or cross edge, then $f[u] > f[v]$ and if this edge is a back edge, then $f[u] \leq f[v]$.

Answer ([Please click here to Add Answer](#))



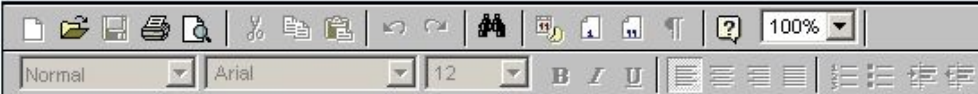
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Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

How the Dijkstra's algorithm works?

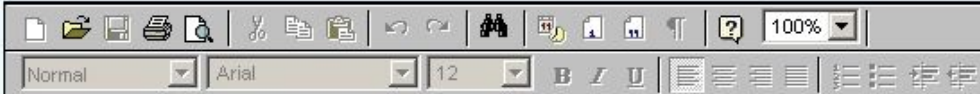
Answer ([Please click here to Add Answer](#))



Made by: Waqar Siddhu

Modify QUICKSORT algorithm such that it sorts array into non-increasing order.

Answer ([Please click here to Add Answer](#))



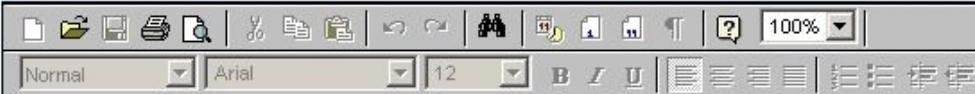
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Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

What do you mean by polynomial time algorithm? Explain what kind of problem can be solved by using polynomial time algorithm?

Answer ([Please click here to Add Answer](#))



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You are given the task of laying down new railway lines which will connect all n cities. Thus for any pair of cities, you will end up with track connecting them. Note that two routes may share the same track; track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Agorithm

Answer ([Please click here to Add Answer](#))



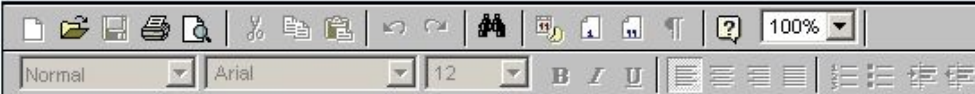
The image shows a rich text editor interface. At the top, there is a toolbar with various icons for text editing and formatting, including a 100% zoom level. Below the toolbar, there is a text area with a font dropdown set to 'Normal', a font family dropdown set to 'Arial', and a font size dropdown set to '12'. The text area is currently empty. In the bottom right corner of the text area, there is a large, stylized signature that reads 'Made by: Waqar Siddhu'.

Question No : 50 of 52

Marks: 5 (Budgeted Time 10 Min)

Considering the recursive version of depth-first traversal implementing Timestamp Structure in pseudo code format, only write DFSVISTIT routine in pseudo code format

Answer ([Please click here to Add Answer](#))



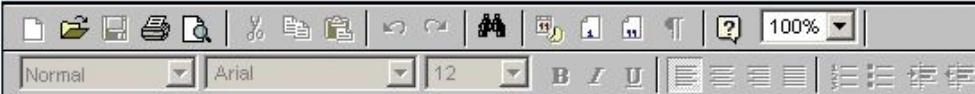
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Question No : 50 of 52

Marks: 5 (Budgeted Time 10 Min)

Considering the recursive version of depth-first traversal implementing Timestamp Structure in pseudo code format, only write DFSVISTIT routine in pseudo code format

Answer ([Please click here to Add Answer](#))

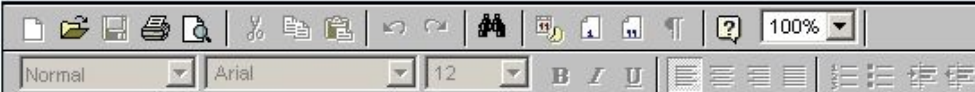


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Develop the running time complexity analysis for the following piece of code. Adopt step wise approach along with asymptotic notation at the end.

```
i=1
while (i < n) {
    i++
}
for ( i=1;i <= n ;i=i*2 )
```

Answer ([Please click here to Add Answer](#))



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Question No : 51 of 52

Marks: 5 (Budgeted Time 10 Min)

Develop the running time complexity analysis for the following piece of code. Adopt step wise approach along with asymptotic notation at the end.

```
i=1
while (i < n) {
    i++
}
for ( i=1;i <= n ;i=i*2 )
for ( j = 1; j <= i; ++j )
```

Answer ([Please click here to Add Answer](#))



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Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

There are given two main connecting or railway lines which connect the following cities shown. There are two parts of track, for the one end of that track connecting with Lahore and the other end of that track laid between Lahore and Islamabad can be used to travel in both directions. Your goal is to use the minimum amount of track. How would you achieve the goal now? (Note : consider the scenario carefully and name only the best suited algorithm)

- 1 Dijkstra's algorithm
- 2 Prims Algorithm
- 3 Folloyed Warshal Algorithm
- 4 Bellman Ford Algorithm.

Answer ([Please click here to Add Answer](#))



Normal Arial 12 B I U

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