

VIRTUAL UNIVERSITY OF PAKISTAN

A Good Education is a Foundation For a Better Future

CORRECT ANSWER SOLVED BY HADI
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TEAM HADI(VU LAHORE)

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Best of luck!



Question No : 1 of 26

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



Calculation by Completion

al Kitab

al-jabrwa'l-muqabalah

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Question No : 2 of 26

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)

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

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

$\Theta(15n^2)$

$\Theta(n^3)$



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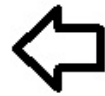
Question No : 3 of 26

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



decrease and conquer

greedy nature

2-dimension Maxima

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Question No : 4 of 26

Marks: 1 (Budgeted Time 1 Min)

Strictly increasing arrays are _____ input for quick sort

Answer (Please select your correct option)

The worst-case



The best-case

Average case

None of the given

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Question No : 5 of 26

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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Question No : 6 of 26

Marks: 1 (Budgeted Time 1 Min)

Quick sort is based on divide and conquer paradigm. In the Combine step of divide and conquer process

Answer (Please select your correct option)

- No work is needed to combine the sub-arrays, the array is already sorted
- Work is needed to combine the sub-arrays; the array is not already sorted.
- Merging the Arrays
- Dividing the arrays



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Question No : 7 of 26

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



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Question No : 8 of 26

Marks: 1 (Budgeted Time 1 Min)

Bubble sort and insertion sort can be implemented as stable algorithms but _____ can not be.

Answer (Please select your correct option)

selection sort



bubble sort

merge sort

stable sort

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Question No : 9 of 26

Marks: 1 (Budgeted Time 1 Min)

Catalan number is given by the formula

Answer (Please select your correct option)

$C(n) = \frac{1}{n+1} \binom{2n}{n}$



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$C(n) = \frac{1}{n-1} \binom{2n}{n}$

$C(n) = \frac{1}{n+1} \binom{n}{2n}$

$C(n) = \frac{1}{n-1} \binom{n}{2n}$

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Question No : 10 of 26

Marks: 1 (Budgeted Time 1 Min)

We can find the product $A \times B$ of matrices A and B, only if they are compatible which means,

Answer (Please select your correct option)

No of Columns of A must be equal to No of Rows of B

No of Columns of A must be equal to No of Columns of B

No of Rows of A must be equal to No of Rows of B

Order of A must be equal to order of B

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Question No : 11 of 26

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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Question No : 12 of 26

Marks: 1 (Budgeted Time 1 Min)

Time complexity of chain matrix multiplication is $\Theta(n^3)$ and space complexity is

Answer (Please select your correct option)

$\Theta(n^2)$



$\Theta(n^3)$

$\Theta(n \log n)$

$\Theta(\log n)$

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Question No : 13 of 26

Marks: 1 (Budgeted Time 1 Min)

The Knapsack problem belongs to the domain of _____ problems.

Answer (Please select your correct option)

Optimization



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NP Complete

Linear Solution

Sorting

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Question No : 14 of 26

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

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Question No : 15 of 26

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 : 16 of 26

Marks: 1 (Budgeted Time 1 Min)

Algorithm's essential elements are

Answer (Please select your correct option)

- Step wise solution
- Stepwise solution and finite time
- Step wise solution finite inputs
- Stepwise approach in which time and memory does not matter.



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Question No : 17 of 26

Marks: 1 (Budgeted Time 1 Min)

Which one is the correct conversion of the given algorithm to sigma notation?

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

1 for i ← 1 to n n times

2 do maximal ← true

3 return maximal

Answer (Please select your correct option)

$\sum_{i=1}^n 4i + 4$

$\sum_{i=1}^n 4i + 2$

$\sum_{i=1}^n 4i + 2i$

$\sum_{i=1}^n 2i + 2$

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Question No : 18 of 26

Marks: 1 (Budgeted Time 1 Min)

Which of the following is calculated with **Big Theta** notation?

Answer (Please select your correct option)

Lower bounds

Upper bounds

Both upper and lower bound

Medium bounds



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Question No : 19 of 26

Marks: 1 (Budgeted Time 1 Min)

Suppose we have an algorithm that carries out N^2 operations for an input of size N . Let us say that a computer takes 1 microsecond ($1/1000000$ second) to carry out one operation. How long does the algorithm run for an input of size 3000?

Answer (Please select your correct option)

90 seconds

9 seconds



0.9 seconds

0.09 seconds

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Question No : 20 of 26

Marks: 1 (Budgeted Time 1 Min)

Which one is the best algorithm from the following with respect to running time?

Answer (Please select your correct option)

$\Theta(n)$

$\Theta(n^2)$



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$\Theta(n \log n)$

$\Theta(n^3)$

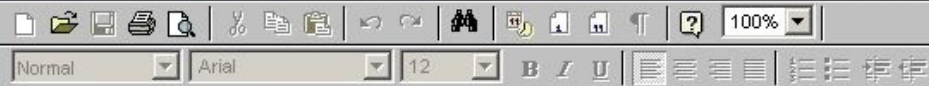
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Question No : 21 of 26

Marks: 2 (Budgeted Time 4 Min)

Consider sorting three numbers a1, a2, and a3 with comparison-based sorting algorithms then how many combinations are possible?

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



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Question No : 23 of 26

Marks: 3 (Budgeted Time 6 Min)

What will be the sorting techniques by analyzing the followings?

- (i) Whenever two consecutive items are found in an array that is out of order, swap them.
- (ii) Assume that $A[1 \dots i - 1]$ have already been sorted. Add $A[i]$ into its proper position in this sub array. Create this position by shifting all larger elements to the right.
- (iii) Assume that $A[1 \dots i - 1]$ contain the $i - 1$ smallest elements in sorted order. Find the smallest element in $A[i \dots n]$ Swap it with $A[i]$.

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



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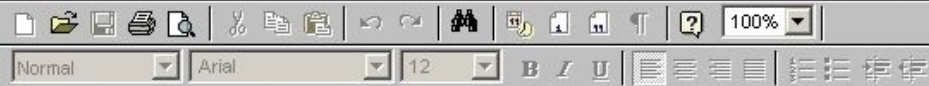
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Question No : 24 of 26

Marks: 3 (Budgeted Time 6 Min)

True or False: A sequence of values in a row 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)



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Question No : 25 of 26

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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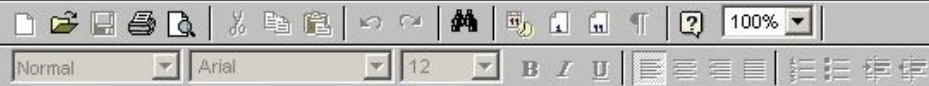
Question No : 26 of 26

Marks: 5 (Budgeted Time 10 Min)

Describe three solution paths for edit distance of these two given words,

1. MATHS
2. ARTS

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



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