

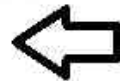
Question No : 1 of 26

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-jabr wa'l-muqabalah



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☐ Calculation by Completion

☐ al Kitab

☐ al-jabr wa'l-muqabalah

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Question No : 2 of 26

Marks: 1 (Budgeted Time 1 Min)

Unlike programs, algorithms to be understood primarily by _____ and _____

Answer (Please select your correct option)

☐ Machines, not people

☐ Mathematical expressions, not algebraic expressions

☒ Programmers, not machines

☐ RAM, not programmer



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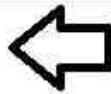
Question No : 3 of 26

Marks: 1 (Budgeted Time 1 Min)

Which formula is used for calculating worst case running time?

Answer (Please select your correct option)

☐ $T_{worst}(n) = \max_{|I|=n} T(I)$



☐ $T_{worst}(n) = \max_{|I|=1} T(I)$

☐ $T_{worst}(n) = \max_{|I|=1} T(n)$

☐ $T_{worst}(n) = \max_{|I|=n} T(n)$

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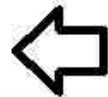
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Analysis of Selection algorithm ends up with,

page 37

Answer (Please select your correct option)

☐ $\Theta(n)$



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☐ $\Theta(1 / 1 + n)$

☐ $\Theta(n / 2)$

☐ $\Theta((n / 2) + n)$

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Question No : 5 of 26

Marks: 1 (Budgeted Time 1 Min)

A (an) _____ is a left-complete binary tree that conforms to the *heap order*.

p 40

Answer (Please select your correct option)

- ☐ heap
- ☐ binary tree
- ☐ binary search tree
- ☐ array
- correct answer solve by hadi

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Question No : 6 of 26

Marks: 1 (Budgeted Time 1 Min)

Principal operation for maintaining the heap property is called heapify, it is also called

p 43

Answer (Please select your correct option)

☐ sifting down



☐ sifting up

☐ sifting left

☐ sifting right

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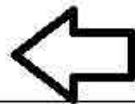
Question No : 7 of 26

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



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☐ All are stable algorithms

☐ None of these

☐ All are unstable algorithms

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Question No : 8 of 26

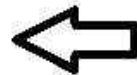
Marks: 1 (Budgeted Time 1 Min)

When primary memory storage is at a premium, a (an) _____ algorithm may be preferable.

⋮ :(

Answer (Please select your correct option)

- ☐ In-place
- ☐ Stable
- ☐ External storage
- ☐ None of these



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Question No : 9 of 26

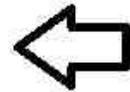
Marks: 1 (Budgeted Time 1 Min)

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

Answer (Please select your correct option)

☐ $\Theta(1)$

☒ $\Theta(n^2)$



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☐ $\Theta(n)$

☐ $\Theta(n \log n)$

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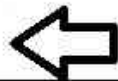
Question No : 10 of 25

Marks: 1 (Budgeted Time 1 Min)

Catalan number is given by the formula

Answer (Please select your correct option)

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



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

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

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

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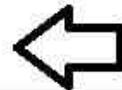
Question No : 11 of 25

Marks: 1 (Budgeted Time 1 Min)

For Chain Matrix Multiplication we can not use divide and conquer approach because,

Answer (Please select your correct option)

☐ We do not know the optimum k



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☐ We use divide and conquer for sorting only

☐ We can easily perform it in linear time

☐ Size of data is not given

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Question No : 12 of 25

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,

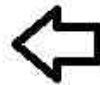
Answer (Please select your correct option)

☐ 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 : 13 of 25

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)

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☐ $\Theta(n^2)$



☐ $\Theta(n^3)$

☐ $\Theta(n \log n)$

☐ $\Theta(\log n)$

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Question No : 14 of 25

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 10 times
```

```
2  do maximal ← true
```

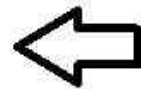
Answer (Please select your correct option)

☐ $\Theta(n^6)$

☐ $\Theta\left(\frac{2n}{n^6}\right)$

☐ $\Theta(n^2)$

☐ $\Theta(2n \lg 6)$



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Question No : 14 of 25

Marks: 1 (Budgeted Time 1 Min)

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

```
1 for i ← 1 to n
2 do maximal ← true
3   for j ← 1 to n
4   do
```

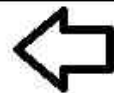
Answer (Please select your correct option)

☐ $\Theta(n^6)$

☐ $\Theta\left(\frac{2n}{n^6}\right)$

☒ $\Theta(n^2)$

☐ $\Theta(2n \lg 6)$



already submit,,,,,correct
answer solve by hadi

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Question No : 14 of 25

Marks: 1 (Budgeted Time 1 Min)

```
3   for j ← 1 to n
4   do
5       if (i ≠ j) & (P[i].x ≤ P[j].x) & (P[i].y ≤ P[j].y)
6           then maximal ← false break
7   if maximal
```

Answer (Please select your correct option)

☐ $\Theta(n^6)$

☐ $\Theta\left(\frac{2n}{n^6}\right)$

☐ $\Theta(n^2)$

☐ $\Theta(2n \lg 6)$



correct answer solve
by hadi...already
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Question No : 14 of 25

Marks: 1 (Budgeted Time 1 Min)

```
5      if (i ≠ j) & (P[i].x ≤ P[j].x) & (P[i].y ≤ P[j].y) 4 accesses
6      then maximal ← false break
7  if maximal
8  then output P[i].x, P[i].y 2 accesses
```

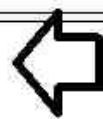
Answer (Please select your correct option)

☐ $\Theta(n^6)$

☐ $\Theta\left(\frac{2n}{n^6}\right)$

☐ $\Theta(n^2)$

☐ $\Theta(2n \lg 6)$



correct answer solve
by hadi....already
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Question No : 15 of 25

Marks: 1 (Budgeted Time 1 Min)

In Sieve Technique, we know _____

it applies to problems where we are interested in finding

a single item from a larger set of n items. We do not know which item is of interest,

repeat

Answer (Please select your correct option)

☐ Item of interest

☐ Order of items

☐ complexity of items

☐ All items are of interest



correct answer solve
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Question No : 16 of 25

Marks: 1 (Budgeted Time 1 Min)

In Random access machine, instructions are executed _____

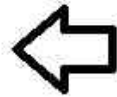
Answer (Please select your correct option)

☐ five at a time

☐ infinite instructions at a time

☐ one-by-one

☐ parallel



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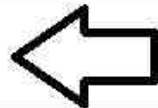
Question No : 17 of 25

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 : 18 of 25

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?

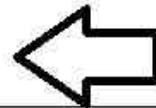
Answer (Please select your correct option)

☐ 90 seconds

☒ 9 seconds

☐ 0.9 seconds

☐ 0.09 seconds



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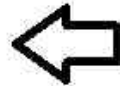
Question No : 19 of 25

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)

- ☐ $\Theta(n)$
- ☒ $\Theta(n^2)$
- ☐ $\Theta(n \log n)$
- ☐ $\Theta(n^3)$



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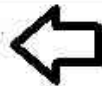
Question No : 20 of 25

Marks: 1 (Budgeted Time 1 Min)

Which of the following is true?

Answer (Please select your correct option)

- ☐ The worst case time complexity of the quick sort is $N \log N$
- ☐ The best case time complexity of the merge sort is $\log N$
- ☐ The worst case time complexity of the selection sort is N^2
- ☐ The worst case time complexity of the merge sort is $\log N$



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Marks: 2 (Budgeted Time 4 Min)

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



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Question No : 22 of 25

Marks: 2 (Budgeted Time 4 Min)

If we solve the knap-sap algorithm with brute force then how much running time will be required?

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



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Question No : 23 of 25

Marks: 3 (Budgeted Time 6 Min)

In comparison based sorting algorithms, there are " $n!$ " Permutations to arrange the elements, and lower bound achieved is $\Omega(n \log n)$. To prove this, which factors of binary tree enable us to take the " $\log$ " for " $n!$ " comparisons?

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



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Question No : 24 of 25

Marks: 3 (Budgeted Time: 6 Min)

What are Catalan numbers? Give the formula to find Catalan numbers.

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



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Question No : 25 of 25

Marks: 5 (Budgeted Time 10 Min)

Consider the following recursive `search` function which returns the index of the array element containing `key`, if such an element exists.

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

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



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Question No : 25 of 25

Marks: 5 (Budgeted Time 10 Min)

```
int mid = (left+right)/2;  
if( left == right )  
    return left;  
else if( array[mid] <= key )  
    return search( array, mid+1, right, key );
```

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



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Question No : 25 of 25

Marks: 5 (Budgeted Time 10 Min)

```
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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```
return search( array, left, mid, key );  
}
```

Given the following declaration:

```
int list[4] = { 5, 6, 7, 8 };
```

does `search(list, 0, 4, 8)` correctly return the index of the `list` element containing 8? Show your work.

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



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Question No : 26 of 25

Marks: 5 (Budgeted Time 10 Min)

Write down the steps of dynamic programming strategy.

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



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Best of luck!

