

# VIRTUAL UNIVERSITY OF PAKISTAN

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**TEAM HADI(VU LAHORE)**

## MID TERM PAST PAPER

We Deal All Kind of VU Project  
(PHP, .NET, ANDROID, PYTHON)

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WARNING: Team HADI is not responsible for any mistake or wrong answer. All students reading and using this document may check and confirm the answers at their own.



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Best of luck!



Question No : 1 of 26

Marks: 1 (Budgeted Time 1 Min)

We analyze an algorithm to check \_\_\_\_\_

Answer ( Please select your correct option )

- whether such an algorithm exists or not
- its running time
- it is a correct algorithm or not
- it will run on machine or not



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1

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Question No : 2 of 26

Marks: 1 (Budgeted Time 1 Min)

What is the asymptotic growth of  $\frac{8n^2}{3} + \frac{n}{5}$  ?

Answer ( Please select your correct option )

$\Theta\left(\frac{8n^2}{3}\right)$

$\Theta\left(\frac{n}{5}\right)$

$\Theta(n^2)$

$\Theta\left(\frac{8}{3}n\right)$



correct answer solve by hadi

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Question No : 3 of 26

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 : 4 of 26

Marks: 1 (Budgeted Time 1 Min)

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

Answer ( Please select your correct option )

- Sieve
- pivot
- Sub problems
- Selection



correct answer solve  
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4

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Question No : 5 of 26

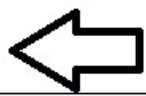
Marks: 1 (Budgeted Time 1 Min)

The sieve technique is a special case, where the number of sub problems is just

the sieve technique is a special case, where the number of subproblems is just 1.

Answer ( Please select your correct option )

- 5
- many
- 1
- few



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Question No : 6 of 26

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 solve  
by hadi



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 : 7 of 26

Marks: 1 (Budgeted Time 1 Min)

In Quick sort, we don't have the control over the sizes of recursive calls

Answer ( Please select your correct option )

- True
- False
- Less information to decide
- Either true or false



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Question No : 8 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



correct answer solve  
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Question No : 9 of 26

Marks: 1 (Budgeted Time 1 Min)

Any binary tree of height  $T(n)$  has at most  $2^{T(n)}$  leaves. Thus a comparison based sorting algorithm can distinguish between at most \_\_\_\_\_ different final outcomes.

Answer ( Please select your correct option )

- $2^{T(n)}$
- $2^{\log(n)}$
- $2^{n-1}$
- $2^n$



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Question No : 10 of 26

Marks: 1 (Budgeted Time 1 Min)

If there are  $\Theta(n^2)$  entries in edit distance matrix then each entry  $E(i, j)$  takes \_\_\_\_\_ time to compute.

Answer ( Please select your correct option )

- $\Theta(1)$   correct answer solve by hadi
- $\Theta(n^2)$
- $\Theta(n)$
- $\Theta(n \log n)$

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Question No : 11 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 )

- $\Theta(1)$
- $\Theta(n^2)$
- $\Theta(n)$
- $\Theta(n \log n)$

correct

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Question No : 12 of 26

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
- Over costing
- Optimized
- None of these



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Question No : 13 of 26

Marks: 1 (Budgeted Time 1 Min)

A problem exhibits optimal structure if an optimal solution to the problem contains within it optimal solution to \_\_\_\_\_

Answer ( Please select your correct option )

Sub-problems



All similar problems

Efficient sorting algorithm

Any unknown problem

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Question No : 14 of 26

Marks: 1 (Budgeted Time 1 Min)

The Knapsack problem belongs to the domain of \_\_\_\_\_ problems.

Answer ( Please select your correct option )

- Optimization  correct answer solve by hadi
- NP Complete
- Linear Solution
- Sorting

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Question No : 15 of 26

Marks: 1 (Budgeted Time 1 Min)

Computational model of sequential RAM is:

Answer ( Please select your correct option )

- Parallel machines may be expensive to model and have more computational power than sequential RAM.
- Computational power of sequential RAM is same as that of parallel machines only time efficiency is achieved with parallel machines
- Both first and second options are true for the statement
- Less powerful computational wise than parallel machines



correct answer solve by hadi

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Question No : 16 of 26

Marks: 1 (Budgeted Time 1 Min)

Merge sort requires

Answer ( Please select your correct option )

- Extra time than other sorting algorithms
- Extra storage
- No need of extra storage
- Sometimes requires extra storage



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Question No : 17 of 26

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
```

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

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Question No : 17 of 26

Marks: 1 (Budgeted Time 1 Min)

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

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

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Question No : 17 of 26

Marks: 1 (Budgeted Time 1 Min)

```
3 for j ← 1 to n n times
4 do
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
```

Answer ( Please select your correct option )

$\Theta(n^6)$

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

$\Theta(n^2)$

$\Theta(2n \lg 6)$



same back,,,,correct answer solve by hadi

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Question No : 17 of 26

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 )

$\Theta(n^6)$

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

$\Theta(n^2)$

$\Theta(2n \lg 6)$



same back,,,,correct  
answer solve by  
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Question No : 18 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
2 do maximal ← true
```

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)

```
1 for i ← 1 to n n times
2 do maximal ← true
3   for j ← 1 to n n times
4   do
5     if (i ≠ j) & (P[i].x ≤ P[j].x) & (P[i].y ≤ P[j].y) 4 accesses
```

Answer ( Please select your correct option )

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

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



correct answer solve by hadi

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

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

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Question No : 18 of 26

Marks: 1 (Budgeted Time 1 Min)

```
3 for j ← 1 to n n times
4 do
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
```

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)

```
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 )

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

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

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

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



correct answer solve by hadi

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Question No : 19 of 26

Marks: 1 (Budgeted Time 1 Min)

When this relation will be true?  $f(n) = O(f(n)^2)$

Answer ( Please select your correct option )

Always True



Never True

Some times True only

True for small values of n

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Question No : 20 of 26

Marks: 1 (Budgeted Time 1 Min)

Which of the following functions grows fastest as n grows larger?

Answer ( Please select your correct option )

- $n^2$  ← correct answer solve by hadi
- $\log n$
- $n \log n$
- $2^n$

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Question No : 21 of 26

Marks: 2 (Budgeted Time 4 Min)

What is the idea behind in counting sort algorithm, to sort the elements without comparisons in linear time?

Answer ( Please click here to Add Answer )

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Question No : 22 of 26

Marks: 2 (Budgeted Time 4 Min)

How edit distance is used for speech reorganization?

Answer ( Please click here to Add Answer )

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Question No : 23 of 26

Marks: 3 (Budgeted Time 6 Min)

How to construct an Optimal Solution for 0/1 knapsack problem?

Answer ( Please click here to Add Answer )

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Question No : 24 of 26

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 : 25 of 26


Marks: 5 (Budgeted Time 10 Min)

The table below shows the contents of an unsorted array. Perform radix sort on this array, show the contents of the array after the first and second pass of the sort.

| Unsorted Data | After Pass 1 | After Pass 2 |
|---------------|--------------|--------------|
| 342           |              |              |
| 103           |              |              |
| ...           |              |              |

Answer ( Please click here to Add Answer )

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Question No : 25 of 26

Marks: 5 (Budgeted Time 10 Min)

|     |  |  |
|-----|--|--|
| 342 |  |  |
| 103 |  |  |
| 211 |  |  |
| 440 |  |  |
| 332 |  |  |
| 441 |  |  |
| ... |  |  |

Answer ( Please click here to Add Answer )

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Question No : 25 of 26

Marks: 5 (Budgeted Time 10 Min)

|     |  |  |
|-----|--|--|
| 200 |  |  |
| 210 |  |  |
| 402 |  |  |
| 312 |  |  |
| 124 |  |  |

Answer ( Please click here to Add Answer )

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Question No : 25 of 26

Marks: 5 (Budgeted Time 10 Min)

|     |  |  |
|-----|--|--|
| 332 |  |  |
| 441 |  |  |
| 200 |  |  |
| 210 |  |  |
| 402 |  |  |
| 312 |  |  |

Answer ( Please click here to Add Answer )

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Question No : 26 of 26

Marks: 5 (Budgeted Time 10 Min)

Complete the following instance of the optimal matrix multiplication ordering problem,

A1 A2 A3 A4 A5 A6  
(6x5) (5x2) (2x8) (8x4) (4x3) (3x9)

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

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Question No : 26 of 26

Marks: 5 (Budgeted Time 10 Min)

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 0 | 1 | 2 | 2 | 2 | ? |
|   | 0 | 2 | 2 | 2 | 2 |
|   |   | 0 | 3 | 4 | 5 |
|   |   |   | 0 | 4 | 5 |
|   |   |   |   | 0 | 5 |
|   |   |   |   |   | 0 |

Answer ( Please click here to Add Answer )

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Question No : 26 of 26


Marks: 5 (Budgeted Time 10 Min)

|   |    |     |     |     |     |
|---|----|-----|-----|-----|-----|
| 0 | 60 | 156 | 172 | 184 | ?   |
| 0 | 0  | 80  | 104 | 118 | 232 |
|   |    | 0   | 64  | 88  | 142 |
|   |    |     | 0   | 96  | 312 |
|   |    |     |     | 0   | 108 |
|   |    |     |     |     | 0   |

Answer ( Please click here to Add Answer )

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- 3) GDB
- 4) GRAND QUIZZES

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