

VIRTUAL UNIVERSITY OF PAKISTAN

A Good Education is a Foundation For a Better Future
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TEAM HADI(VU LAHORE)

MID TERM PAST PAPER

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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 # 13 of 30 (Start time: 12:14:51 PM, 04 January 2021)

Total Marks: 1

Counting sort is suitable for sorting the elements within range 1 to P, where _____

Select the correct option

☐	P is large
☒	P is small
☐	P is very large
☐	P is undetermined

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Question # 16 of 30 (Start time: 12:45:06 PM, 04 January 2021)

Total Marks: 1

Algorithm is a sequence of computational steps that _____ the input into output.

Select the correct option

☐	merge	
☐	assign	
☒	transform	
☐	integrate	

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Question # 9 of 30 (Start time: 12:11:50 PM, 04 January 2021)

Total Marks: 1

Fibonacci Sequence was named on _____, a famous mathematician in 12th Century.

Select the correct option

☐	Fred Brooks
☐	Grady Booch
☒	Leonardo Pisano
☐	Edgar F. Codd

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Question # 2 of 30 (Start time: 12:06:48 PM, 04 January 2021)

Total Marks: 1

In plane sweep approach, a vertical line is swept across the 2d-plane and _____ structure is used for holding the maximal points lying to the left of the sweep line.

Select the correct option

☐	Array
☐	Queue
☒	Stack
☐	Tree

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Question # 8 of 30 (Start time: 12:10:49 PM, 04 January 2021)

Total Marks: 1

If matrix A of dimension $p \times q$ is multiplied with matrix B of dimension $q \times r$, then each entry in resultant matrix takes _____ time.

Select the correct option

☒	$O(q)$
☐	$O(1)$
☐	$O(p \times q)$
☐	$O(q \times r)$

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Question # 20 of 30 (Start time: 12:19:57 PM, 04 January 2021)

Total Marks: 1

In plane sweep approach of solving geometric problems, a _____ is swept across the plane.

Select the correct option

☒	Line
☐	Plane
☐	Cube
☐	Box

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Question # 5 of 30 (Start time: 12:08:29 PM, 04 January 2021)

Total Marks: 1

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

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Select the correct option

- | | |
|----------------------------------|-----------------|
| ☐ | $2 * (h+1) - 1$ |
| ☒ | $2^{(h+1)} - 1$ |
| ☐ | $2 * (h+1)$ |
| ☐ | $((h+1)^2) - 1$ |

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Question # 6 of 30 (Start time: 12:37:35 PM, 04 January 2021)

Total Marks: 1

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

Select the correct option

☐	$\Theta(n)$	
☒	$\Theta(n^2)$	
☐	$\Theta(1)$	
☐	$\Theta(n \log n)$	

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Question # 21 of 30 (Start time: 12:21:31 PM, 04 January 2021)

Total Marks: 1

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

Select the correct option

- | | | |
|----------------------------------|--------------------|--|
| ☐ | $\Theta(n)$ | |
| ☐ | $\Theta(1)$ | |
| ☒ | $\Theta(n^2)$ | |
| ☐ | $\Theta(n \log n)$ | |

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Question # 10 of 30 (Start time: 12:12:31 PM, 04 January 2021)

Total Marks: 1

Boolean operation is a _____ operation on an idealized RAM model of computation.

Select the correct option

☐	Starting	
☒	Basic	
☐	Advance	
☐	Normal	

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Question # 19 of 30 (Start time: 12:19:24 PM, 04 January 2021)

Total Marks: 1

Which of the following is calculated with Big O notation?

Select the correct option

- | | |
|----------------------------------|-----------------------------|
| ☐ | Medium bounds |
| ☒ | Upper bounds |
| ☐ | Lower bounds |
| ☐ | Both upper and lower bounds |

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Question # 15 of 30 (Start time: 12:44:42 PM, 04 January 2021)

Total Marks: 1

A sorting algorithm is called as _____ if duplicate elements remain in the same relative position after sorting.

Select the correct option

☐	Parallel	
☐	$O(n)$ algorithm	
☒	Stable	
☐	Complex	

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Question # 12 of 30 (Start time: 12:14:28 PM, 04 January 2021)

Total Marks: 1

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

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Select the correct option

☒	Overlapping	
☐	Over costing	
☐	Optimized	
☐	Three	

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Question # 12 of 30 (Start time: 12:42:15 PM, 04 January 2021)

Total Marks: 1

In Heap Sort algorithm, if heap property is violated:

Select the correct option

☐	We call Build heap procedure	
☒	We call Heapify procedure	
☐	We ignore	
☐	Heap property can never be violated	

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Question # 17 of 30 (Start time: 12:45:35 PM, 04 January 2021)

Total Marks: 1

In Heap Sort algorithm, the first step is to _____.

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Select the correct option

- | | | |
|----------------------------------|------------------------------------|--|
| ☐ | Call Build-Heap procedure | |
| ☒ | Sort the array in descending order | |
| ☐ | Call Heapify procedure | |
| ☐ | Find the number of input elements | |

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Question # 8 of 30 (Start time: 12:38:53 PM, 04 January 2021)

Total Marks: 1

_____ programming is essentially recursion without repetition.

Select the correct option

☐	Fast
☒	Dynamic
☐	Array
☐	N log n

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Question # 25 of 30 (Start time: 12:25:28 PM, 04 January 2021)

Total Marks: 1

The only way to convert a string of i characters into the empty string is with i deletions, represented as _____.

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Select the correct option

- | | | |
|----------------------------------|---------------|--|
| ☐ | $E(0, j) = j$ | |
| ☐ | $E(i, j) = i$ | |
| ☐ | $E(0, i) = j$ | |
| ☒ | $E(i, 0) = i$ | |

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Question # 6 of 30 (Start time: 12:09:19 PM, 04 January 2021)

Total Marks: 1

The O-notation is used to state only the asymptotic _____ bounds.

Select the correct option

☐	Two	
☐	Lower	
☒	Upper	
☐	Both lower & upper	

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Question # 26 of 30 (Start time: 12:51:59 PM, 04 January 2021)

Total Marks: 1

The sieve technique works where we have to find _____ item(s) from a large input.

Select the correct option

☒	Single
☐	Two
☐	Three
☐	Similar

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Question # 14 of 30 (Start time: 12:15:34 PM, 04 January 2021)

Total Marks: 1

In merge sort algorithm, we split the array _____ to find index q.

Select the correct option

- | | | |
|----------------------------------|------------------------|--|
| ☐ | from start | |
| ☒ | midway | |
| ☐ | from end | |
| ☐ | both from start or end | |

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Question # 11 of 30 (Start time: 12:12:58 PM, 04 January 2021)

Total Marks: 1

_____ is a linear time sorting algorithm:

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Select the correct option

☐	Merge sort	
☒	Radix sort	
☐	Quick sort	
☐	Bubble sort	

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Question # 23 of 30 (Start time: 12:23:49 PM, 04 January 2021)

Total Marks: 1

The time assumed for each basic operation to execute on RAM model of computation is _____

Select the correct option

☐	Infinite	
☐	Continuous	
☒	Constant	
☐	Variable	

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Question # 7 of 30 (Start time: 12:38:02 PM, 04 January 2021)

Total Marks: 1

In Dynamic Programming based solution of knapsack problem, to compute entries of "V", we will imply a(n) _____ approach.

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Select the correct option

☐	Subjective	
☒	Inductive	
☐	Brute Force	
☐	Combination	

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Question # 17 of 30 (Start time: 12:17:39 PM, 04 January 2021)

Total Marks: 1

Developing a dynamic programming algorithm generally involves _____ separate steps.

Select the correct option

☐	One
☒	Two
☐	Three
☐	Four

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Question # 19 of 30 (Start time: 12:46:57 PM, 04 January 2021)

Total Marks: 1

Memoization is a part of _____ programming strategy.

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Select the correct option

☐	slow
☐	fast
☒	dynamic
☐	memory

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Question # 15 of 30 (Start time: 12:16:29 PM, 04 January 2021)

Total Marks: 1

Radix sort performs sorting the numbers _____ digit(s) at a time.

Select the correct option

☒	One
☐	Two
☐	Three
☐	All

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Question # 9 of 30 (Start time: 12:39:38 PM, 04 January 2021)

Total Marks: 1

We can multiply two matrices A and B only when they are compatible which means:

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Select the correct option

- | | | |
|----------------------------------|--|--|
| ☒ | Number of columns in A must be equal to number of rows in B | |
| ☐ | Number of rows and columns do not matter | |
| ☐ | Number of columns in A must be equal to number of columns in B | |
| ☐ | Number of rows in A must be equal to number of rows in B | |

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Question # 14 of 30 (Start time: 12:43:37 PM, 04 January 2021)

Total Marks: 1

Which one is not passed as parameter in Quick sort algorithm?

Select the correct option

- | | | |
|----------------------------------|-----------------------------------|--|
| ☐ | End of the array | |
| ☐ | Middle of the array | |
| ☒ | Array (containing input elements) | |
| ☐ | Start of the array | |

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Question # 18 of 30 (Start time: 12:18:20 PM, 04 January 2021)

Total Marks: 1

If p_j dominates p_i and p_i dominates p_h then p_j also dominates p_h . It means dominance relation is _____.

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Select the correct option

☒	Transitive
☐	Non Transitive
☐	Equation
☐	Symbolic

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Question # 27 of 30 (Start time: 12:52:28 PM, 04 January 2021)

Total Marks: 1

If the time complexity of an algorithm is given by $O(1)$, then its time complexity would be:

Select the correct option

☐	Polynomial	
☐	Exponential	
☒	Constant	
☐	Average	

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Question # 16 of 30 (Start time: 12:17:12 PM, 04 January 2021)

Total Marks: 1

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

Select the correct option

☐	Stack
☒	Linked list
☐	Hash table
☐	Heap

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Question # 24 of 30 (Start time: 12:50:29 PM, 04 January 2021)

Total Marks: 1

Brute-force algorithm for 2D-Maxima is operated by comparing _____ pairs of points.

Select the correct option:

☐	Two
☐	Some
☐	Most
☒	All

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Question # 10 of 30 (Start time: 12:41:05 PM, 04 January 2021)

Total Marks: 1

The definition of theta-notation relies on proving _____ asymptotic bound.

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Select the correct option

☐	one
☐	lower
☐	upper
☒	both lower and upper

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Question # 4 of 30 (Start time: 12:07:55 PM, 04 January 2021)

Total Marks: 1

In the analysis of Selection algorithm, we get the convergent _____ series.

Select the correct option:

☐	Harmonic
☐	Linear
☐	Arithmetic
☒	Geometric

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Question # 3 of 30 (Start time: 12:07:17 PM, 04 January 2021)

Total Marks: 1

Catalan numbers are related the number of different _____ on 'n' nodes.

Select the correct option

☐	arrays
☐	linked lists
☒	binary trees
☐	functions

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