VIRTUAL UNIVERSITY OF PAKISTAN

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TEAM HADI(VU LAHORE)

MID TERM PAST PAPER

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Best of luck!

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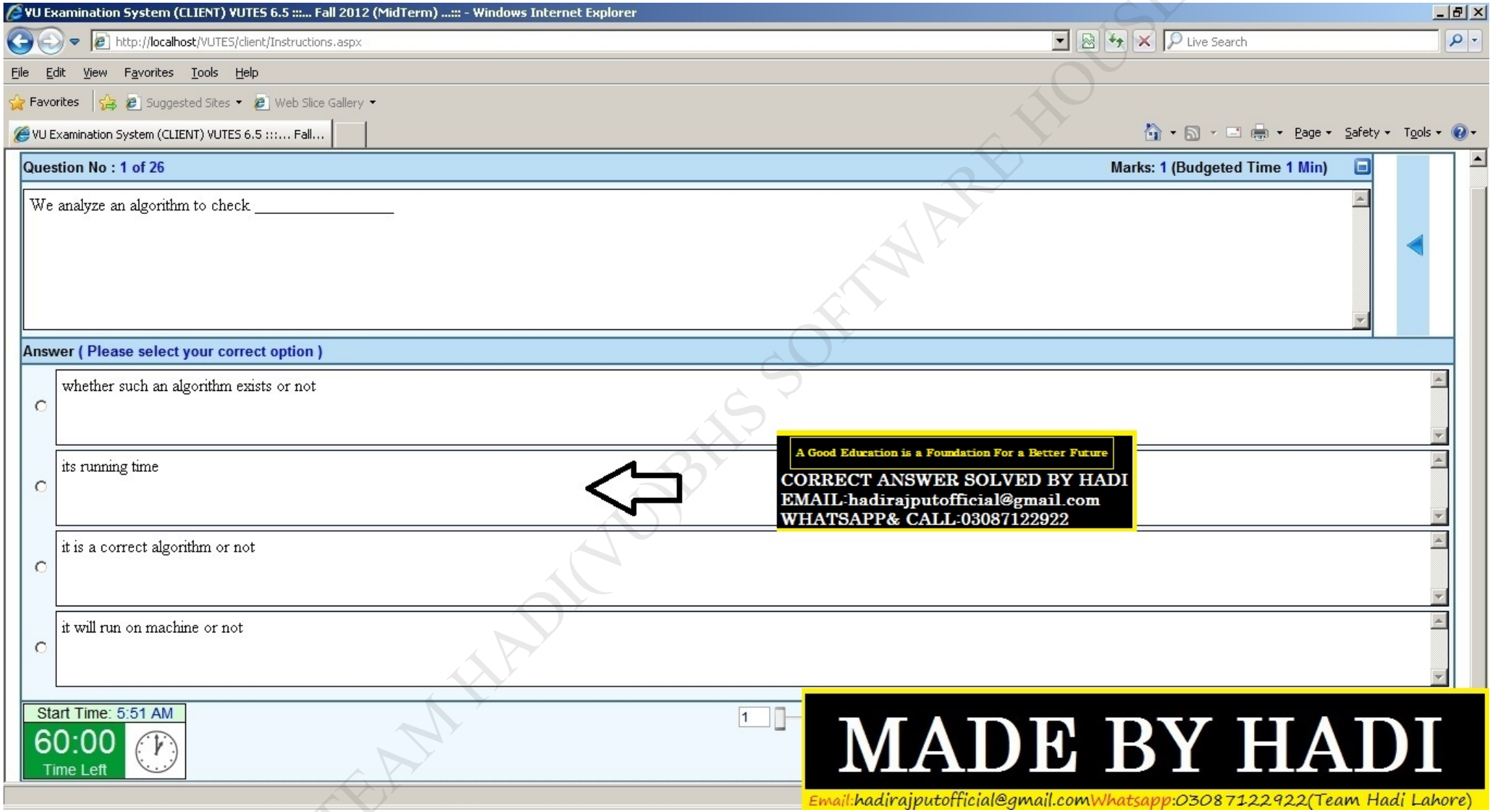

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Question No : 2 of 26 **Marks: 1 (Budgeted Time 1 Min)**

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

Answer (Please select your correct option)

- $\Theta\left(\frac{8n^2}{3}\right)$
- $\Theta\left(\frac{n}{5}\right)$
- $\Theta\left(n^2\right)$ ⇦ correct answer solve by hadi
- $\Theta\left(\frac{8}{3}n\right)$

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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

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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 Θ (1)
- Time will vary according to the nature of input data
- It can not be predicted
- It will take Θ (log n)

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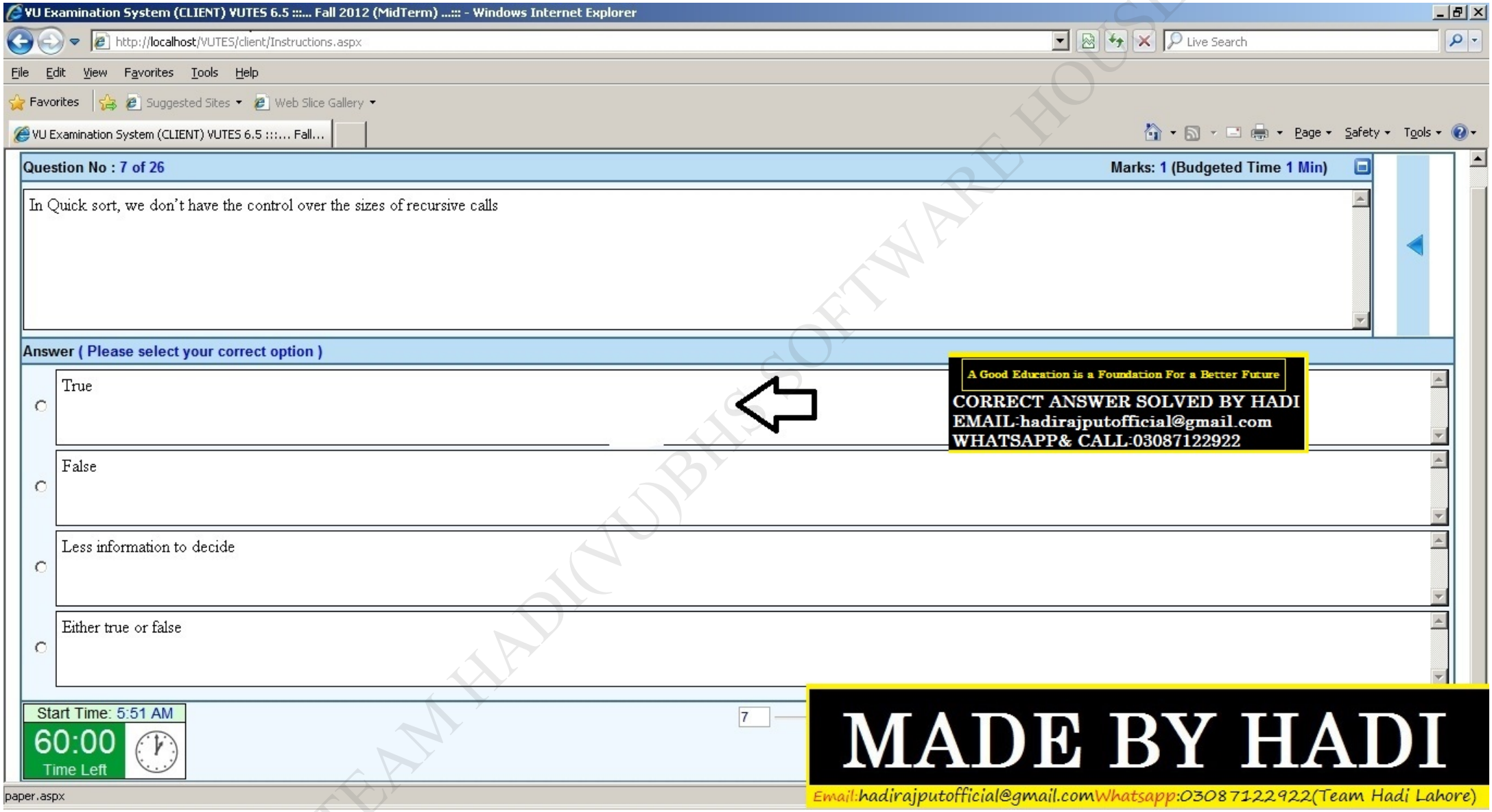

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Question No : 8 of 26 **Marks: 1 (Budgeted Time 1 Min)**

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

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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 Θ (n^2) entries in edit distance matrix then each entry E (i, j) takes _____ time to compute.

Answer (Please select your correct option)

- Θ (1)
- Θ (n^2)
- Θ (n)
- Θ (n log n)

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Question No : 11 of 26 **Marks: 1 (Budgeted Time 1 Min)**

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

Answer (Please select your correct option)

- Θ (1)
- Θ (n^2) **correct**
- Θ (n)
- Θ (n log n)

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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

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- NP Complete
- Linear Solution
- Sorting

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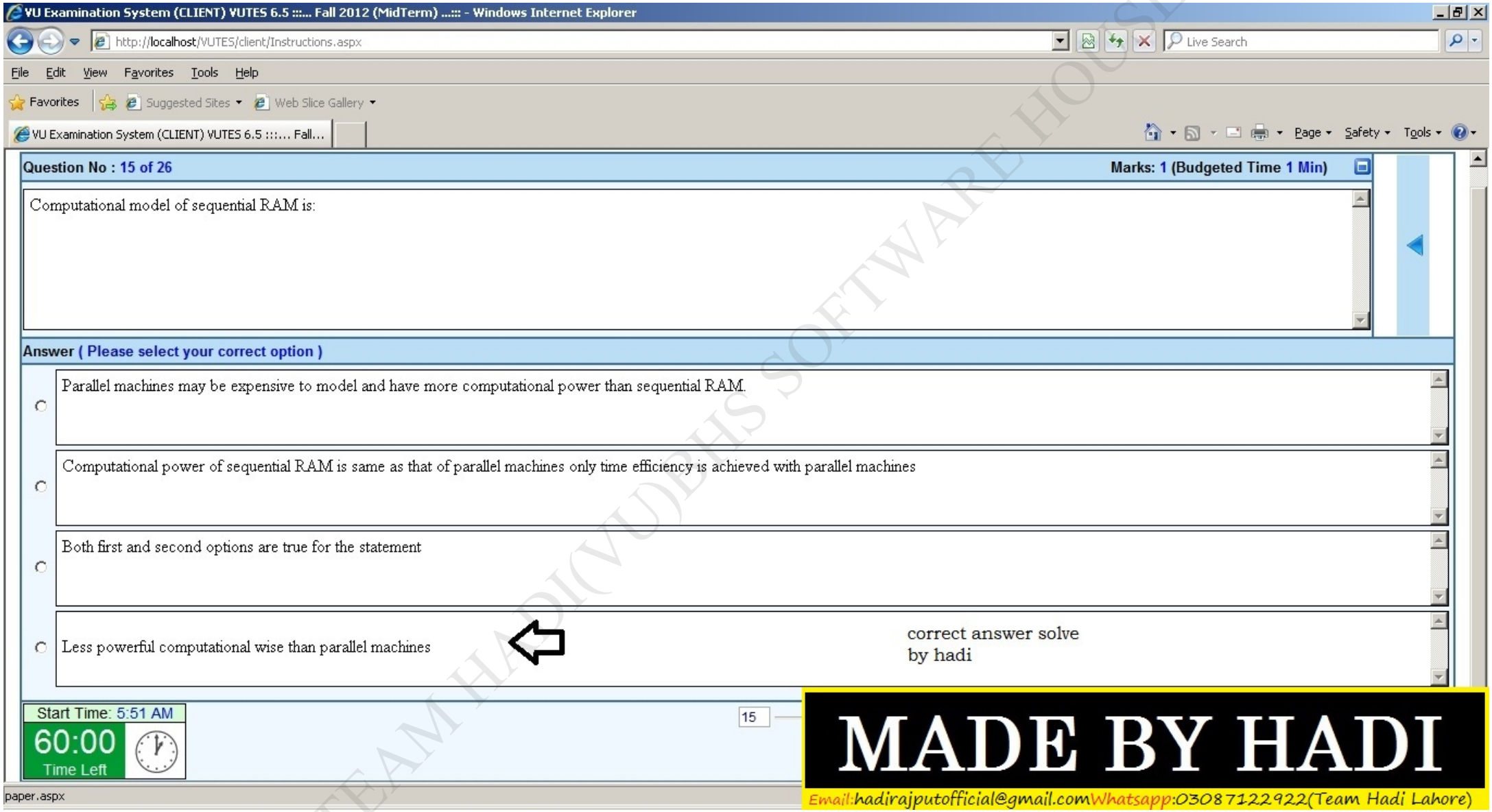

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Question No : 16 of 26 **Marks: 1 (Budgeted Time 1 Min)**

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)

- $\Theta(n^6)$
- $\Theta\left(n^{\frac{2n}{6}}\right)$
- $\Theta(n^2)$ ⇦ correct answer solve by hadi
- $\Theta(2n \lg 6)$

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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)

- $\Theta(n^6)$
- $\Theta\left(n^{\frac{2n}{6}}\right)$
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Question No : 17 of 26 **Marks: 1 (Budgeted Time 1 Min)**

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6           then maximal ← false break
7     if maximal
```

Answer (Please select your correct option)

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

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)

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

same back,,,,correct answer solve by hadi

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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        n times
2  do maximal ← true
```

Answer (Please select your correct option)

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

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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)

- $\sum_{i=1}^{n} 4n + 4$
- $\sum_{i=1}^{n} 4n + 2$ ⇦ correct answer solve by hadi
- $\sum_{i=1}^{n} 4n + 2n$
- $\sum_{i=1}^{n} 2n + 2$

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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)

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

correct answer solve
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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)

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

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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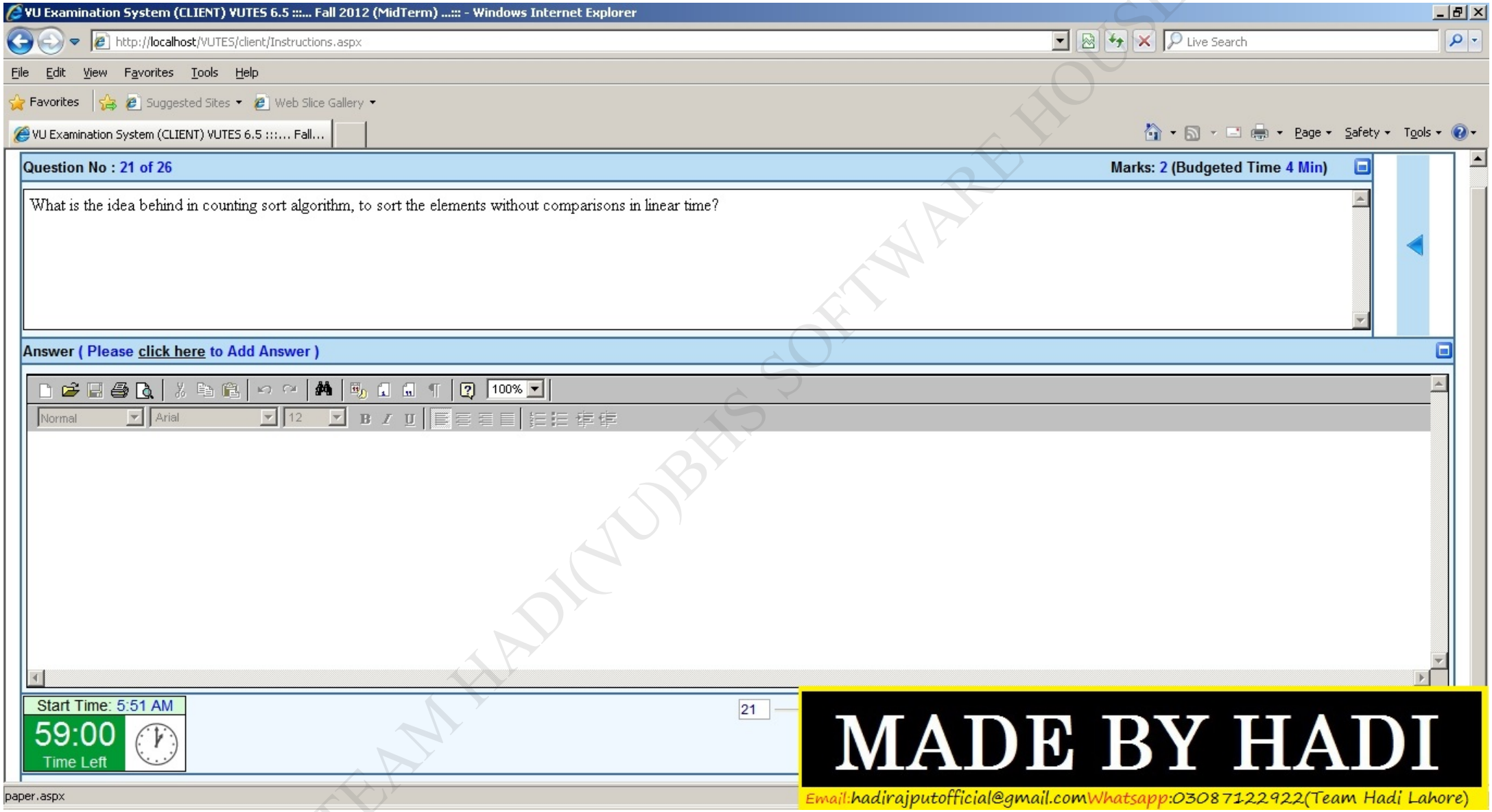

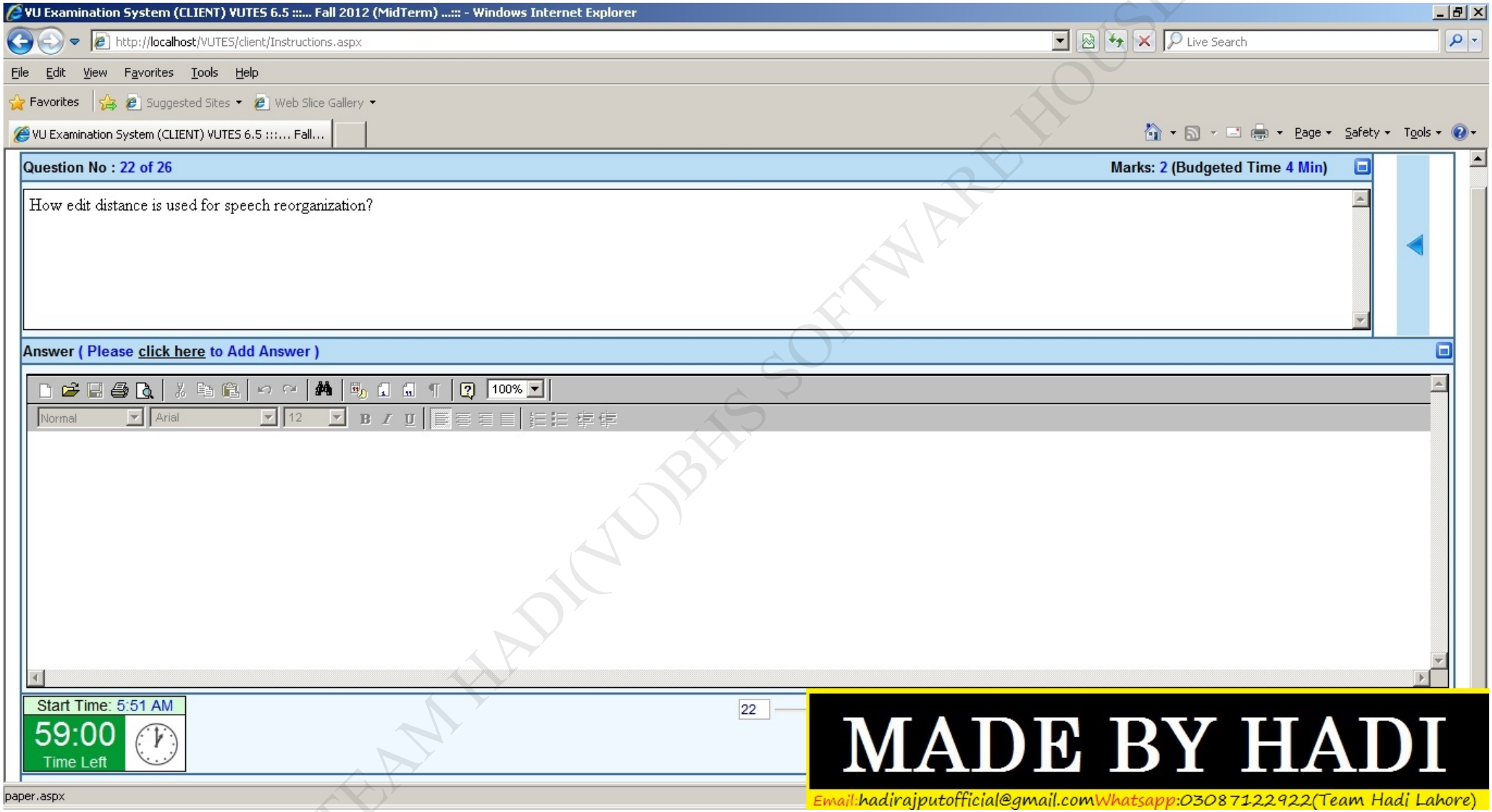

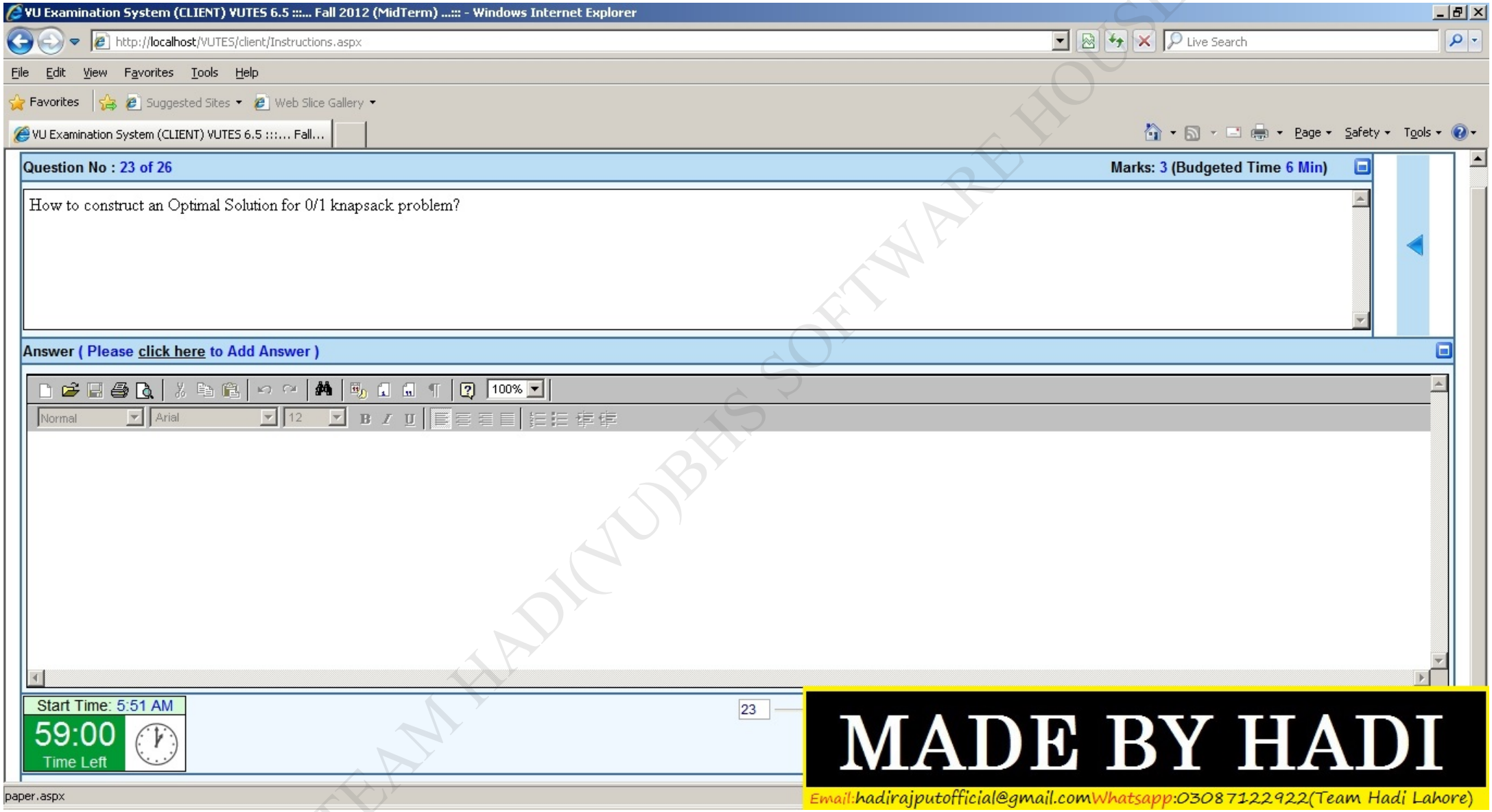

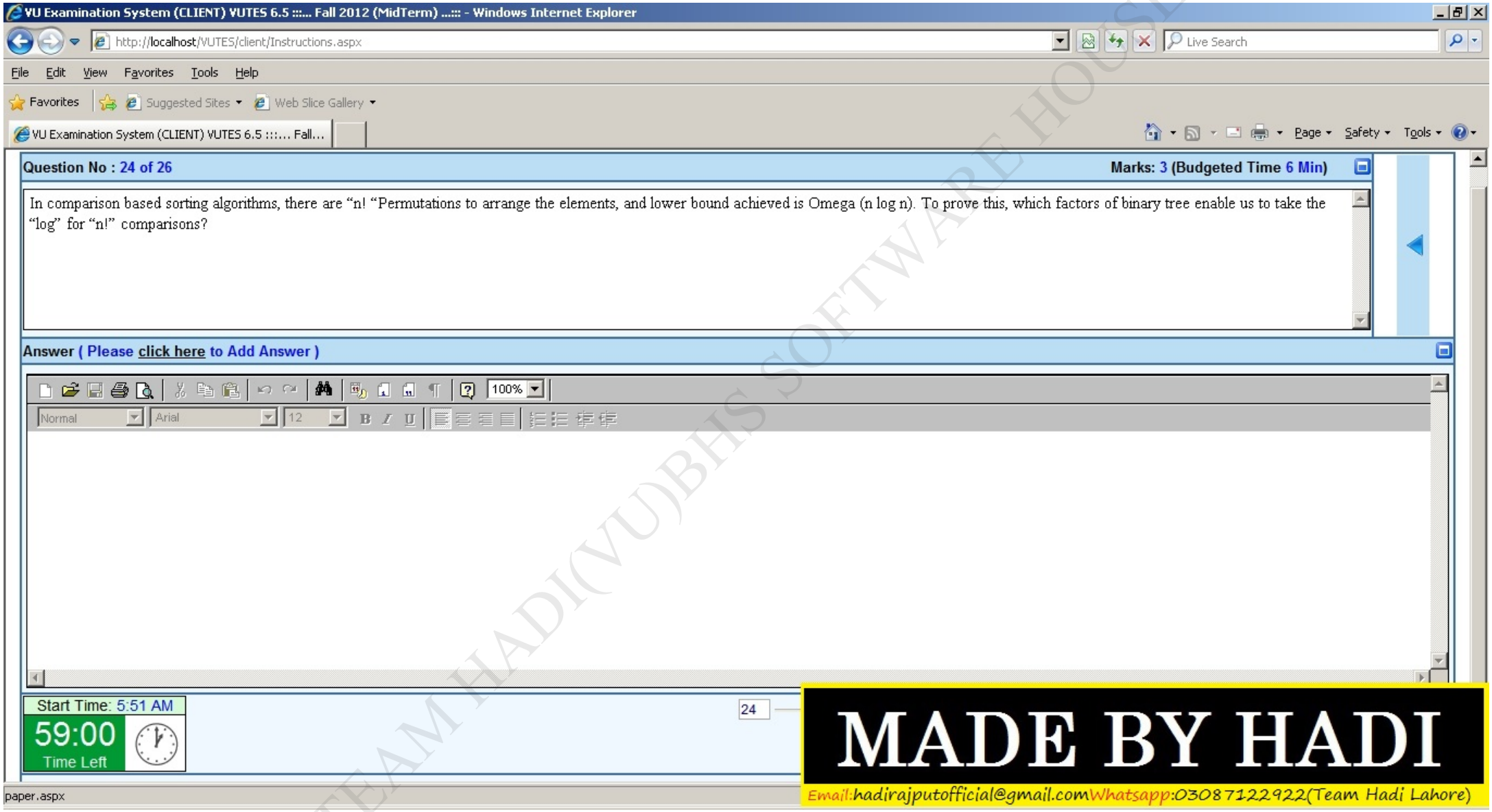

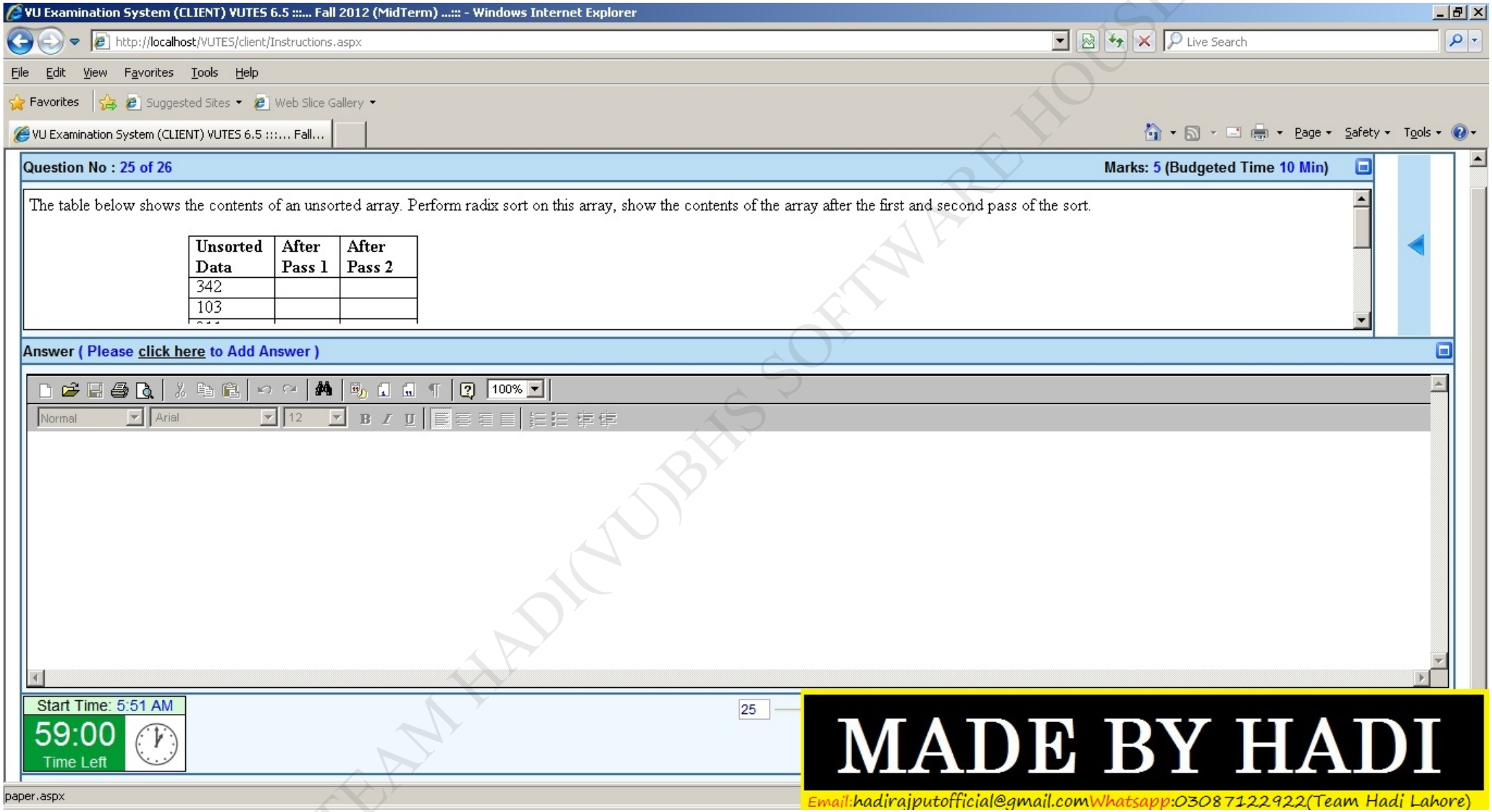

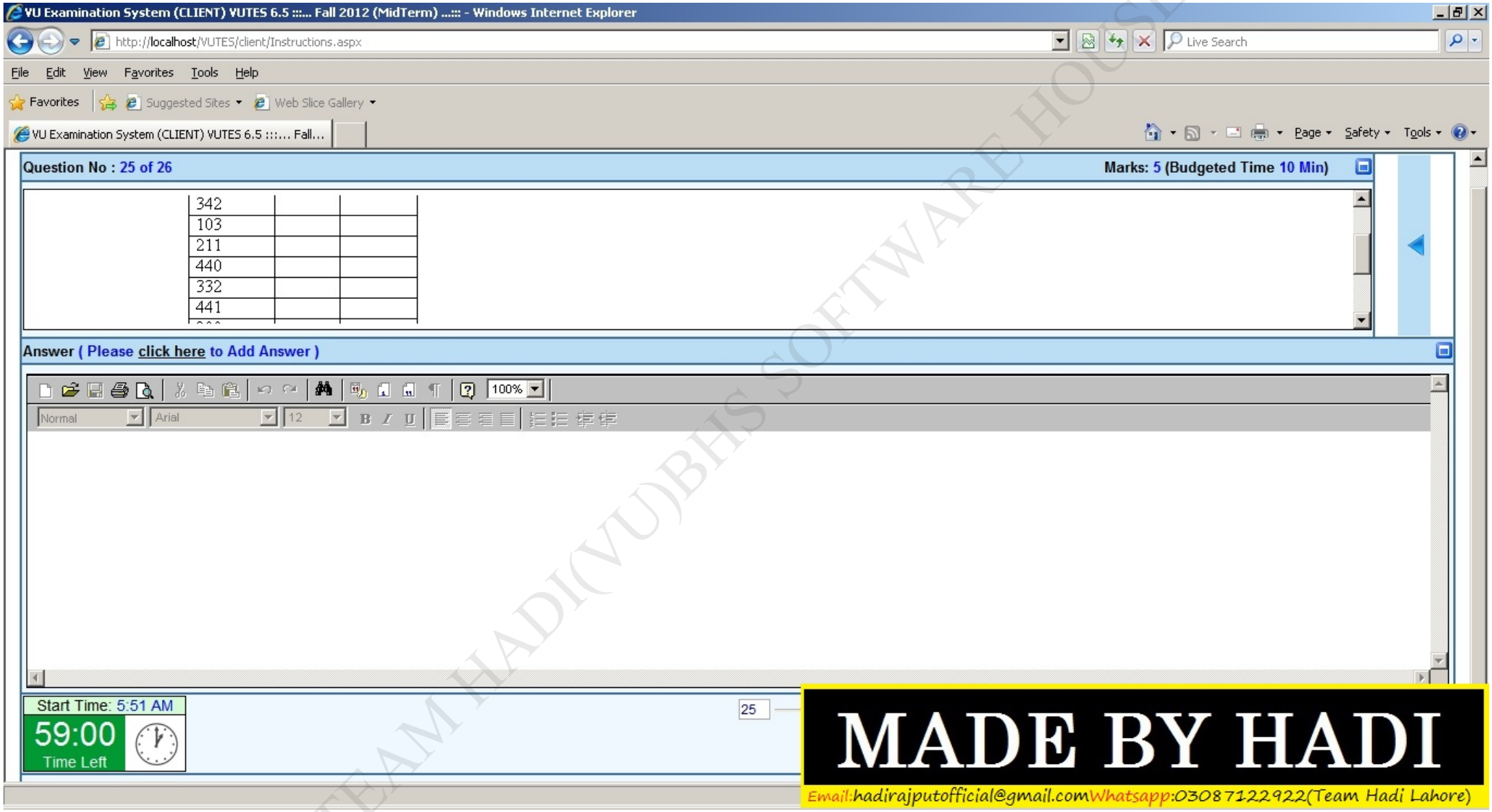

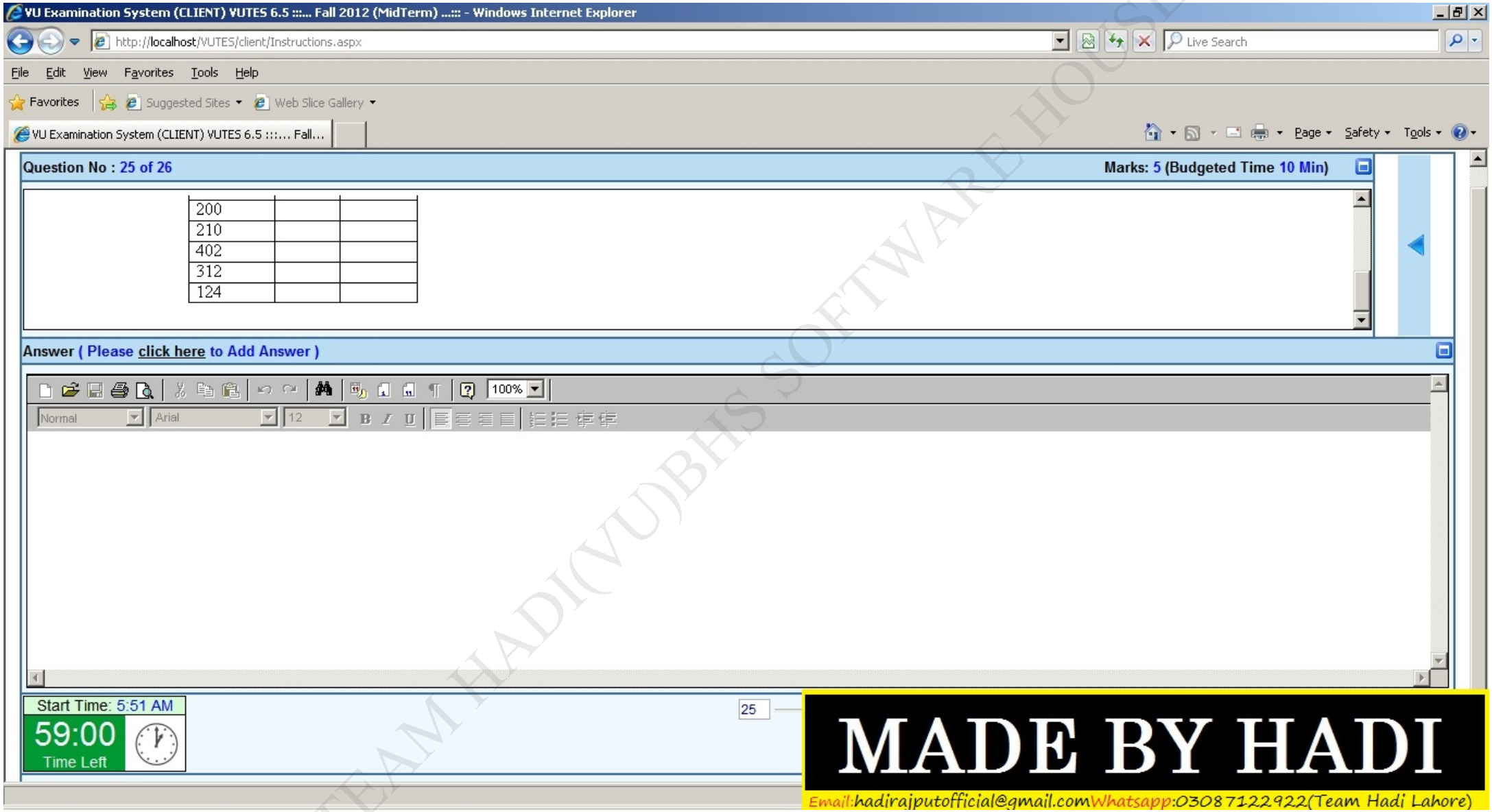

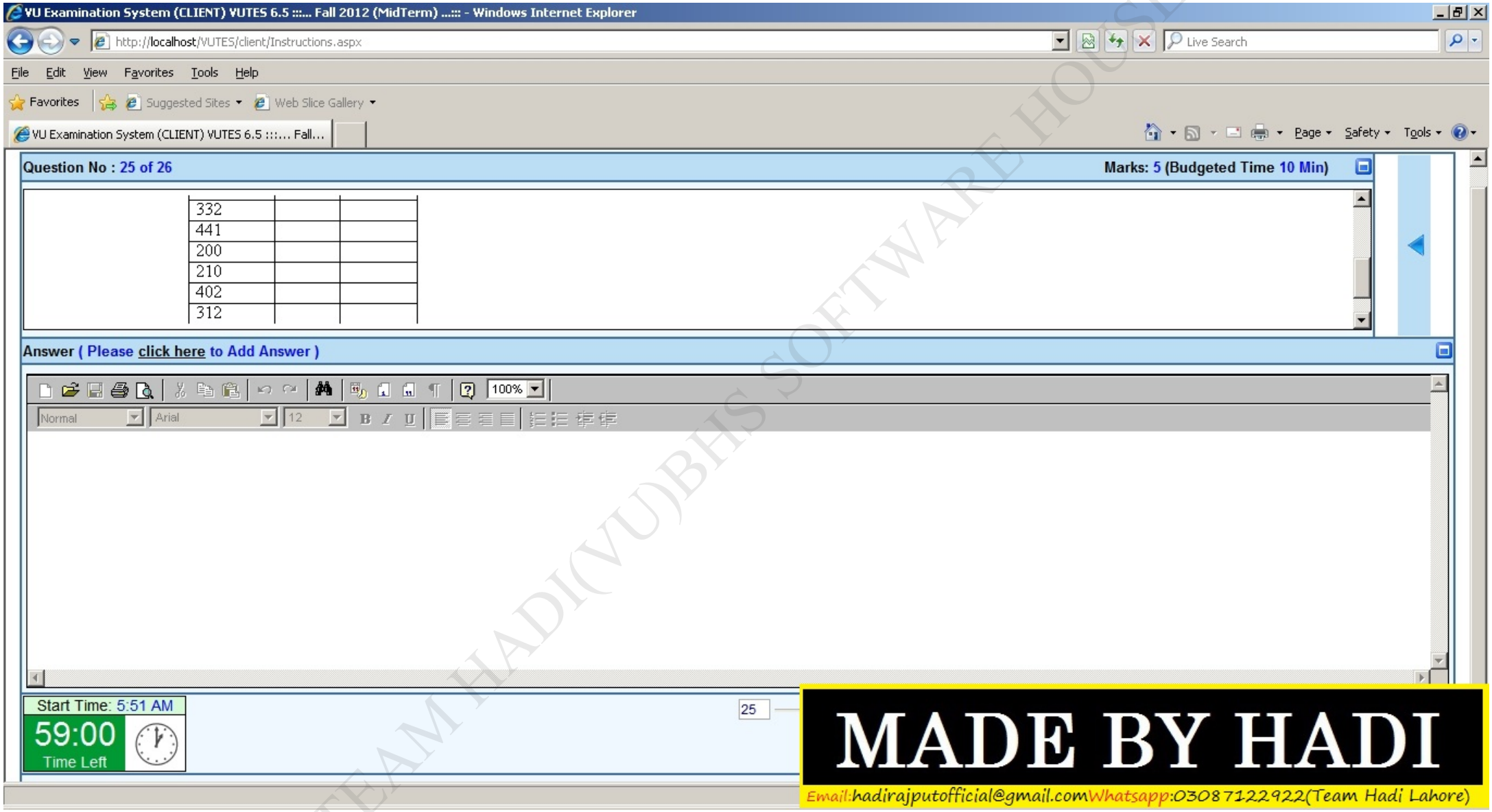

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Question No : 26 of 26 **Marks: 5 (Budgeted Time 10 Min)**

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	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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