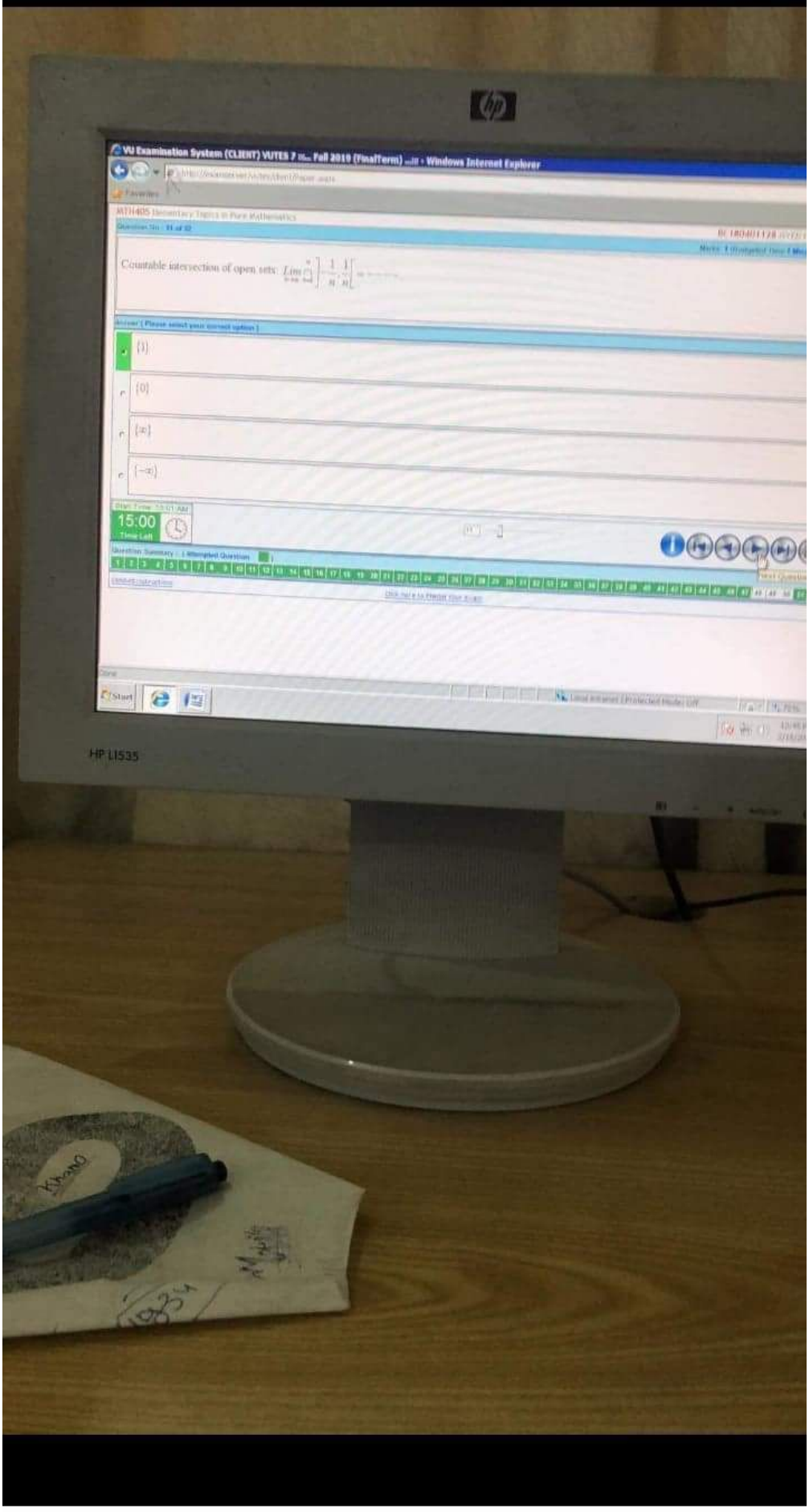
VU Examination System (CLIENT) VUTES 7 ... Fall 2019 (FinalTerm) ... Windows Internet Explorer
Countable intersection of open sets:
15:00
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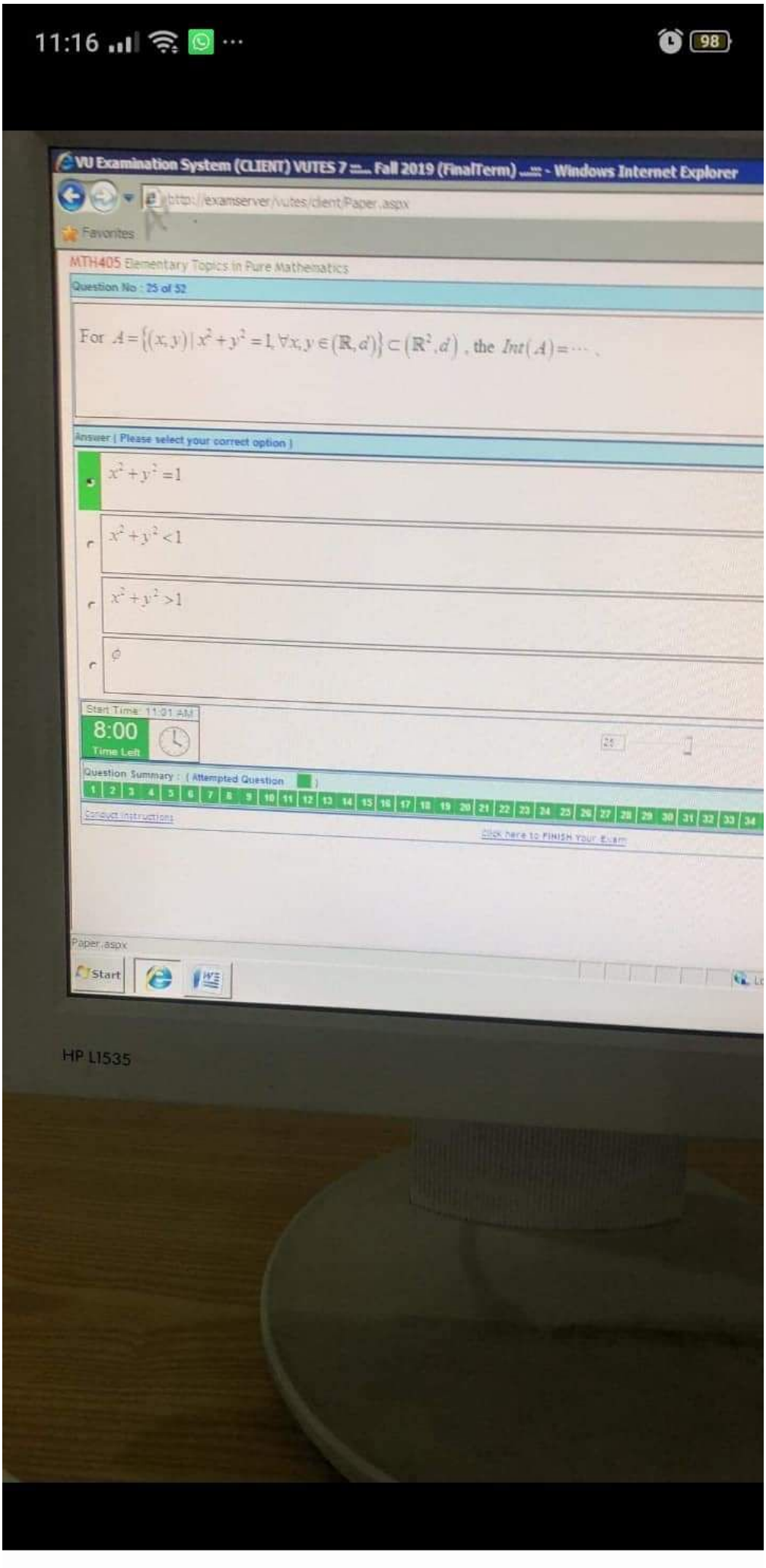
VU Examination System (CLIENT) VUTES 7 ... Fall 2019 (FinalTerm) ... - Windows Internet Explorer
http://examserver/vutes/client/Paper.aspx
Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 25 of 52
For $A=\{(x,y)\mid x^2+y^2=1, \forall x,y\in(\mathbb{R},d)\}\subset(\mathbb{R}^2,d)$, the $Int(A)=\cdots$.
Answer (Please select your correct option)
$x^2+y^2=1$
$x^2+y^2<1$
$x^2+y^2>1$
ϕ
Start Time 11:01 AM
8:00
Time Left
Question Summary : (Attempted Question)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34
Solving Instructions
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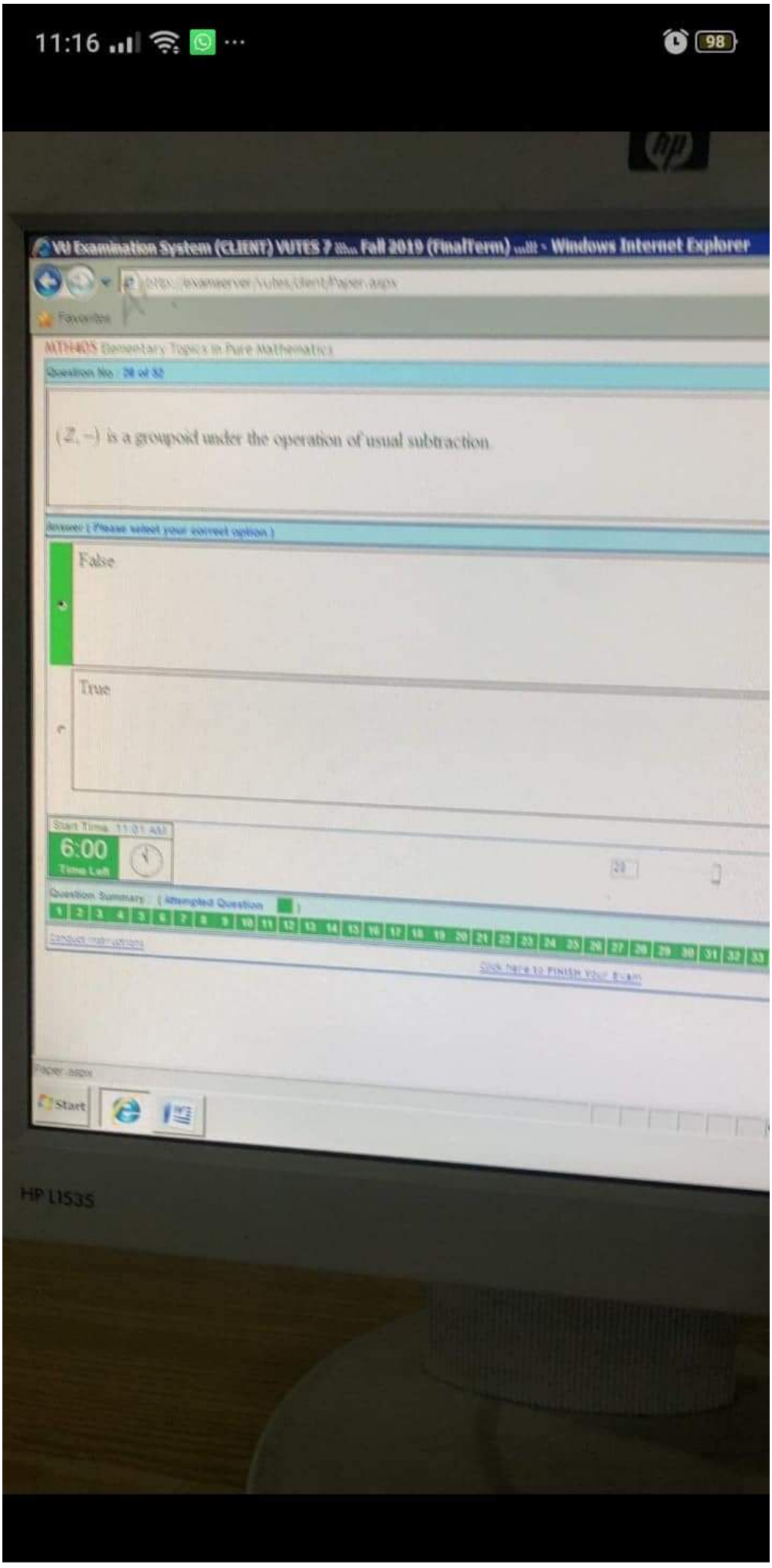
VU Examination System (CLIENT) VUTES 7 ... Fall 2019 (FinalTerm) ... - Windows Internet Explorer
MTH405 Elementary Topics in Pure Mathematics
(Z, −) is a groupoid under the operation of usual subtraction
False
True
6:00
Time Left
Question Summary
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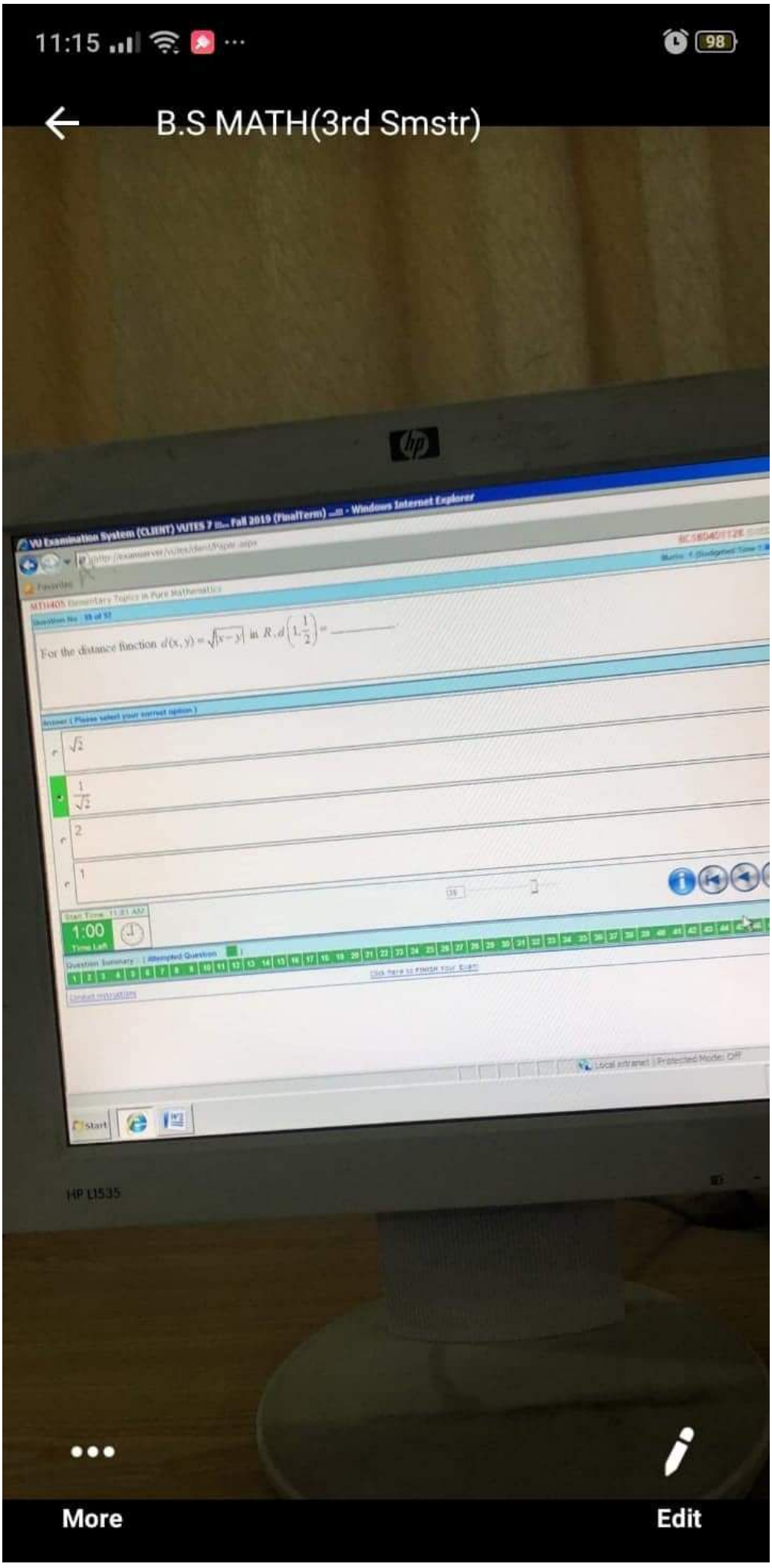
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B.S MATH(3rd Smstr)
VU Examination System (CLIENT) VUTES 7 ... Fall 2019 (FinalTerm) ... - Windows Internet Explorer
MTH405 Elementary Topics in Pure Mathematics
For the distance function $d(x,y)=\sqrt{|x-y|}$ in $R, d\left(1,\frac{1}{2}\right)=$ _____
$\sqrt{2}$
$\frac{1}{\sqrt{2}}$
2
1
1:00
Time Left
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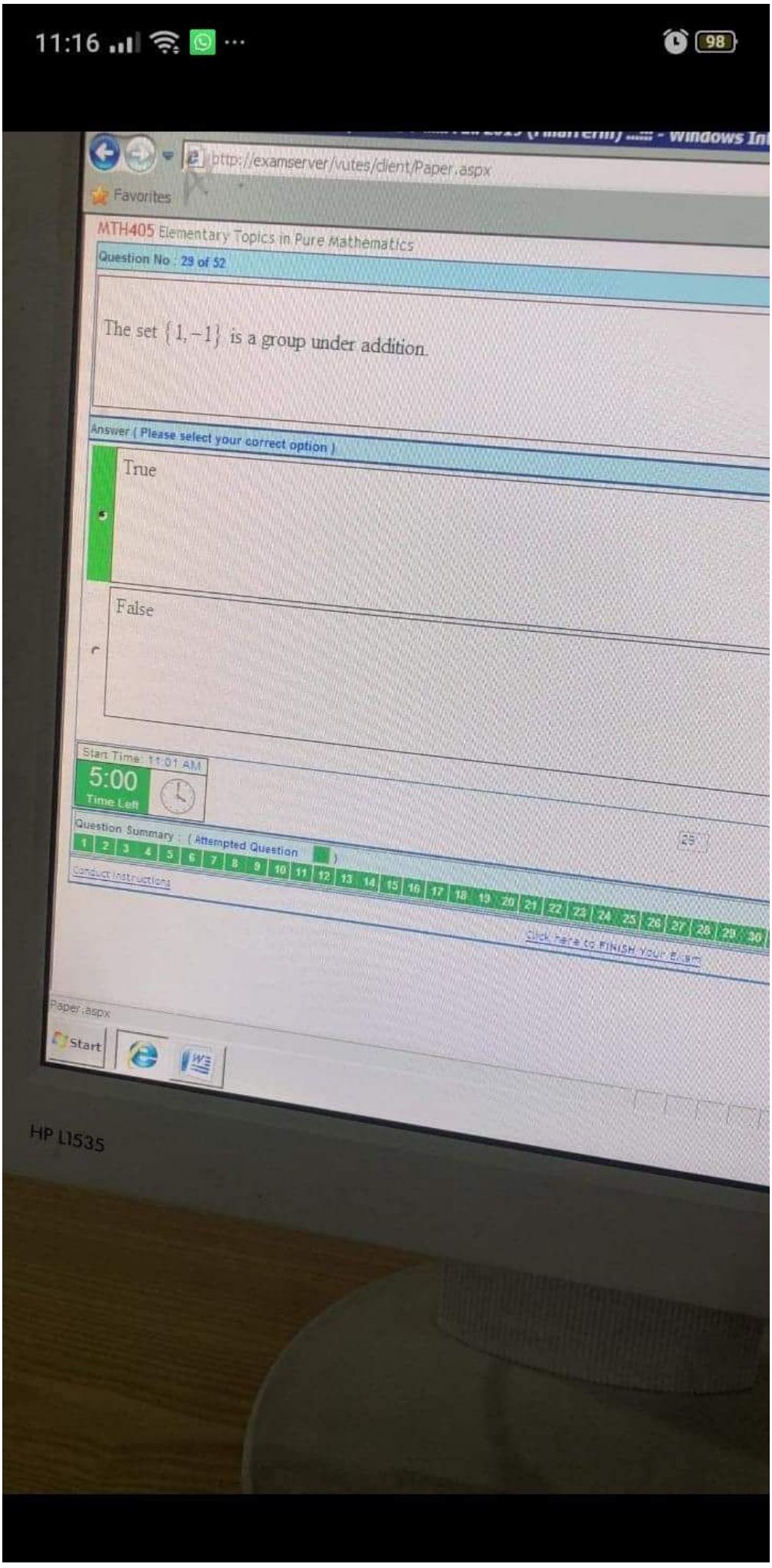
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http://examserver/vutes/client/Paper.aspx
Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 29 of 52
The set $\{1,-1\}$ is a group under addition.
Answer (Please select your correct option)
True
False
Start Time: 11:01 AM
5:00
Time Left
Question Summary : (Attempted Question)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
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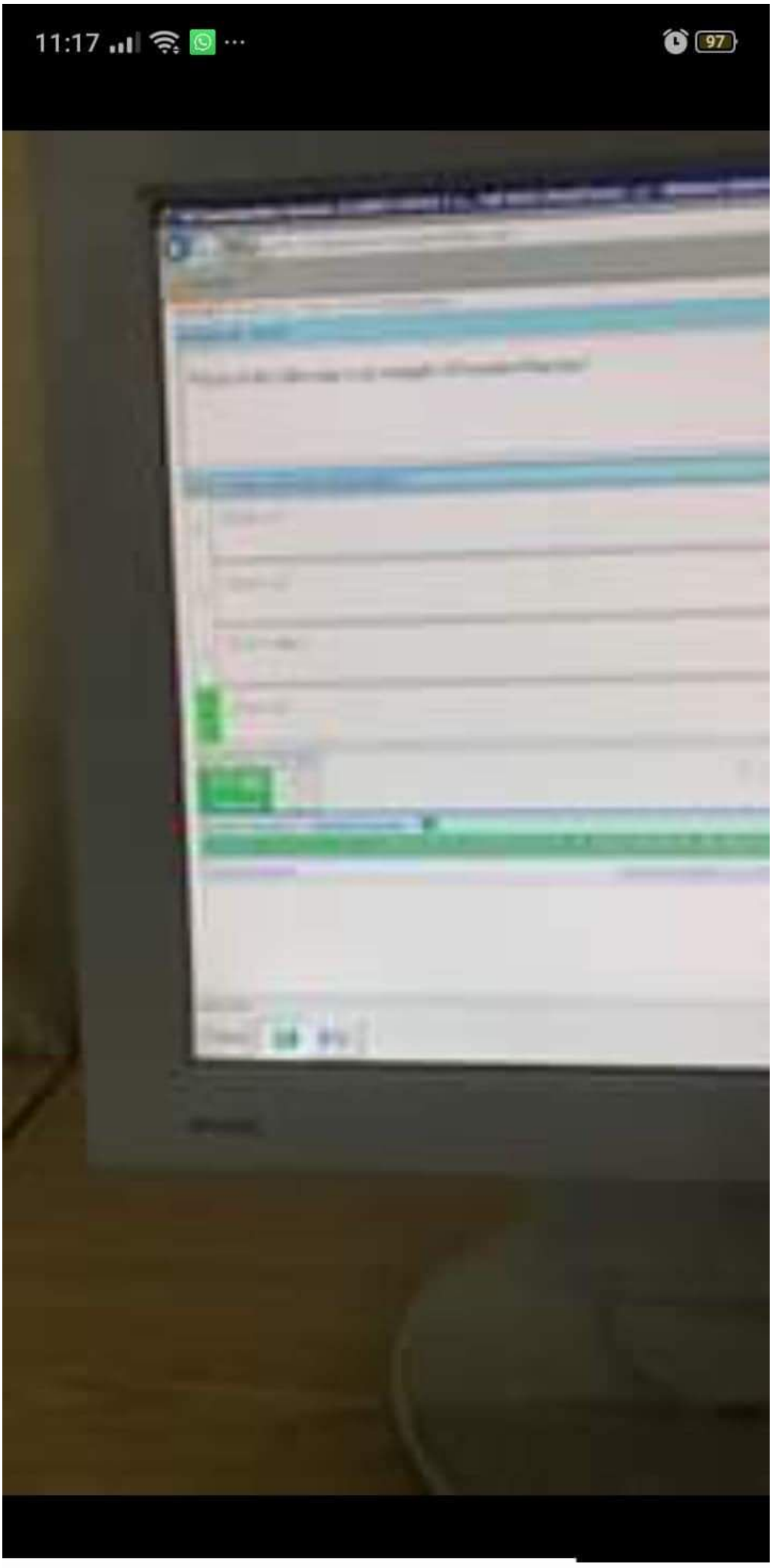
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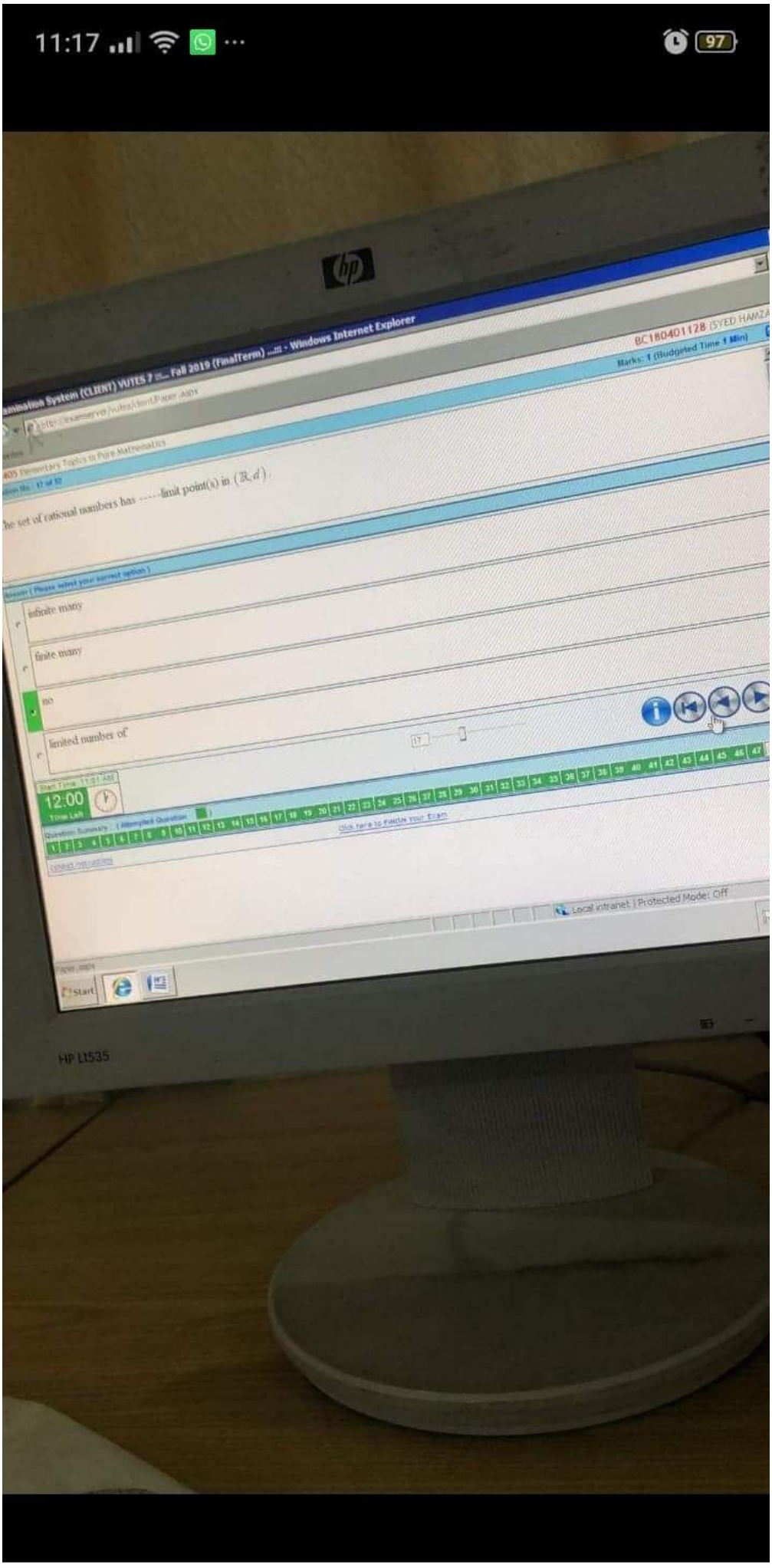
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Windows Internet Explorer
BC180401128
Marks: 1 (Budgeted Time 1 Min)
The set of rational numbers has -----limit point(s) in $(\mathbb{R}, d)$.
infinite many
finite many
no
limited number of
12:00
Time Left
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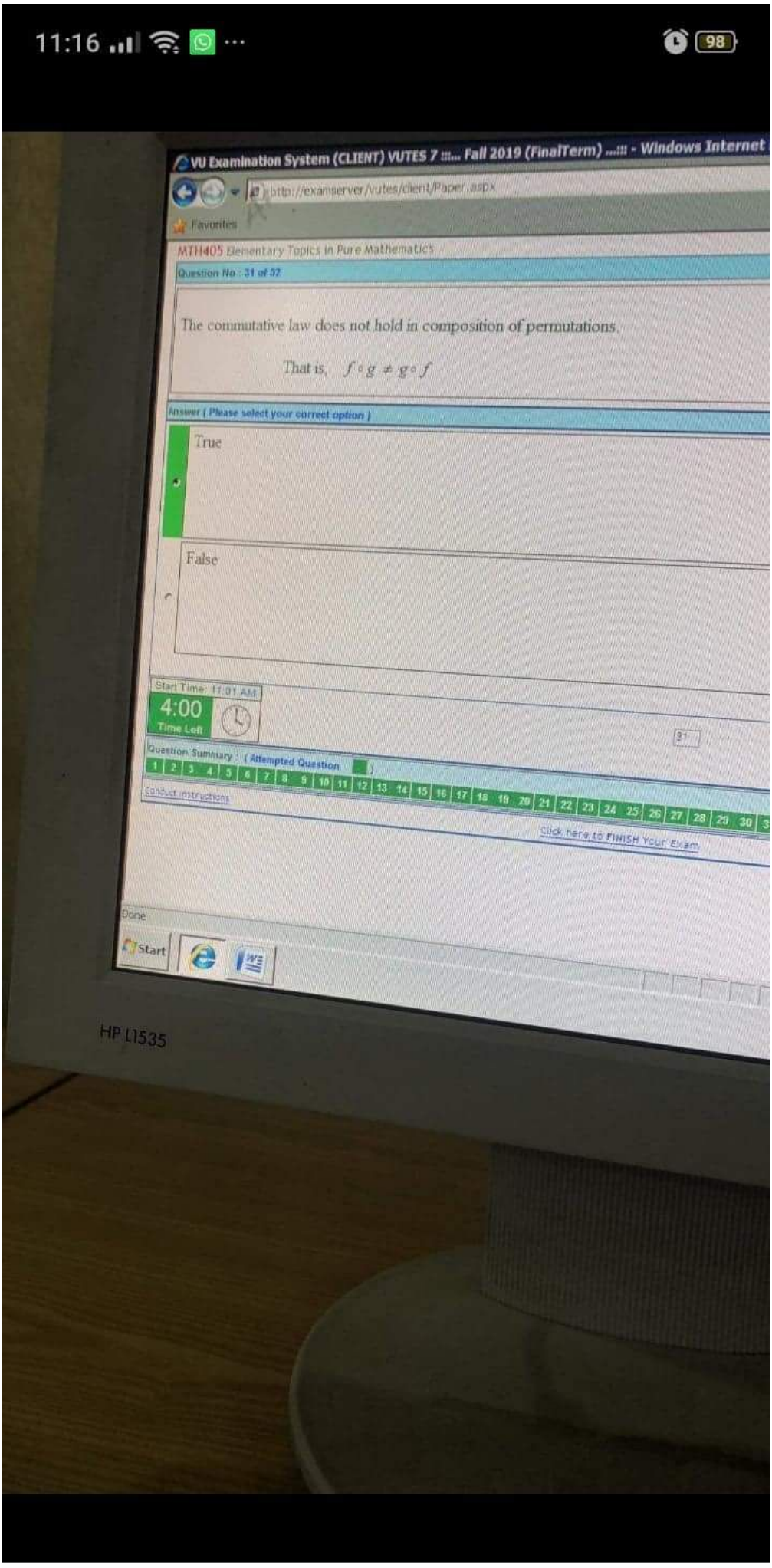
VU Examination System (CLIENT) VUTES 7 !!!.... Fall 2019 (FinalTerm) ....!!! - Windows Internet
http://examserver/vutes/client/Paper.aspx
Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 31 of 52
The commutative law does not hold in composition of permutations.
That is, $f \circ g \neq g \circ f$
Answer (Please select your correct option)
True
False
Start Time: 11:01 AM
4:00
Time Left
Question Summary : (Attempted Question)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Consult Instructions
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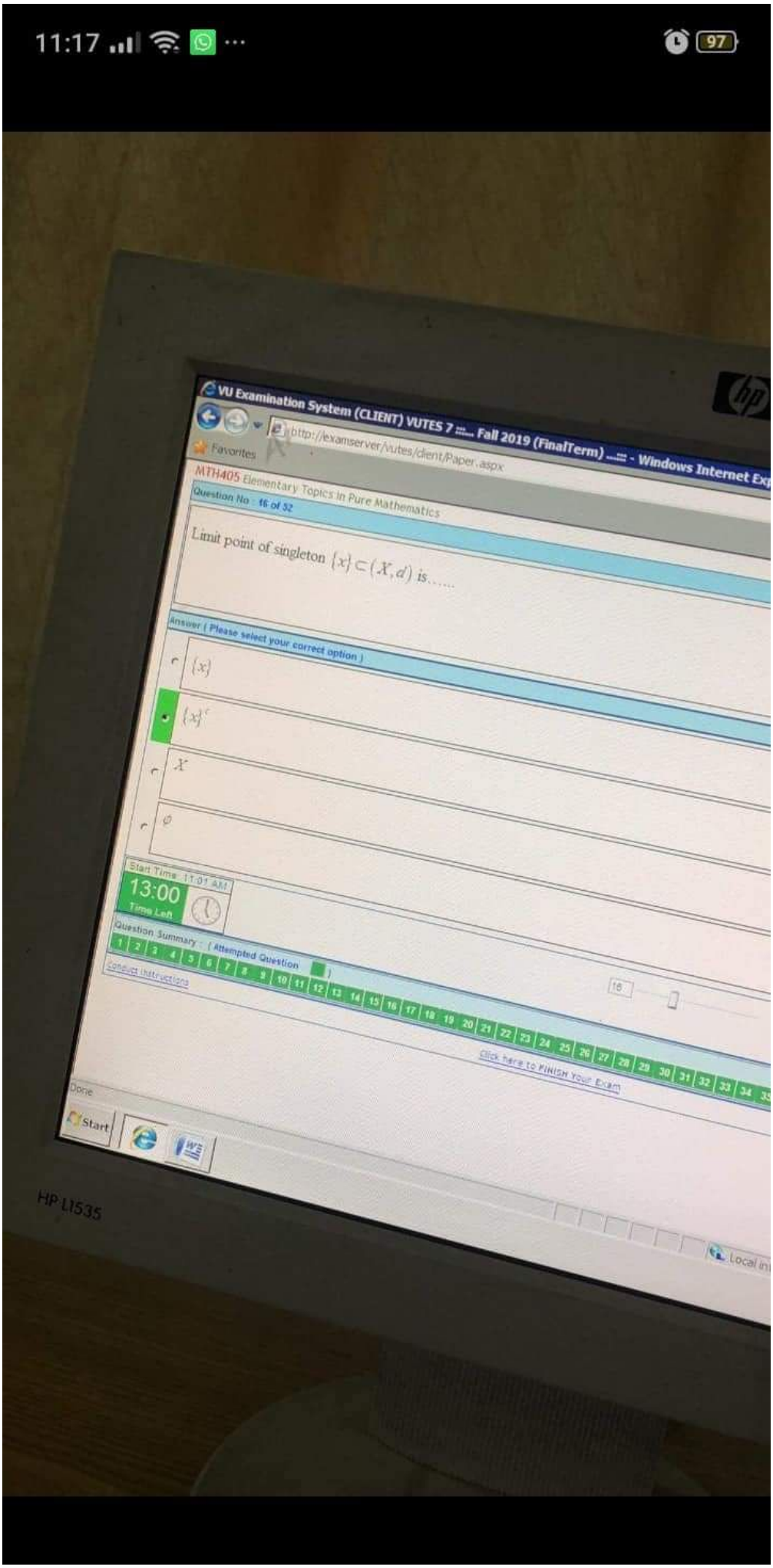
VU Examination System (CLIENT) VUTES 7 .... Fall 2019 (FinalTerm) .... - Windows Internet Ex
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Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 16 of 52
Limit point of singleton $\{x\} \subset (X,d)$ is.....
Answer (Please select your correct option)
$\{x\}$
$\{x\}^c$
X
$\emptyset$
Start Time : 11:01 AM
13:00
Time Left
Question Summary : (Attempted Question)
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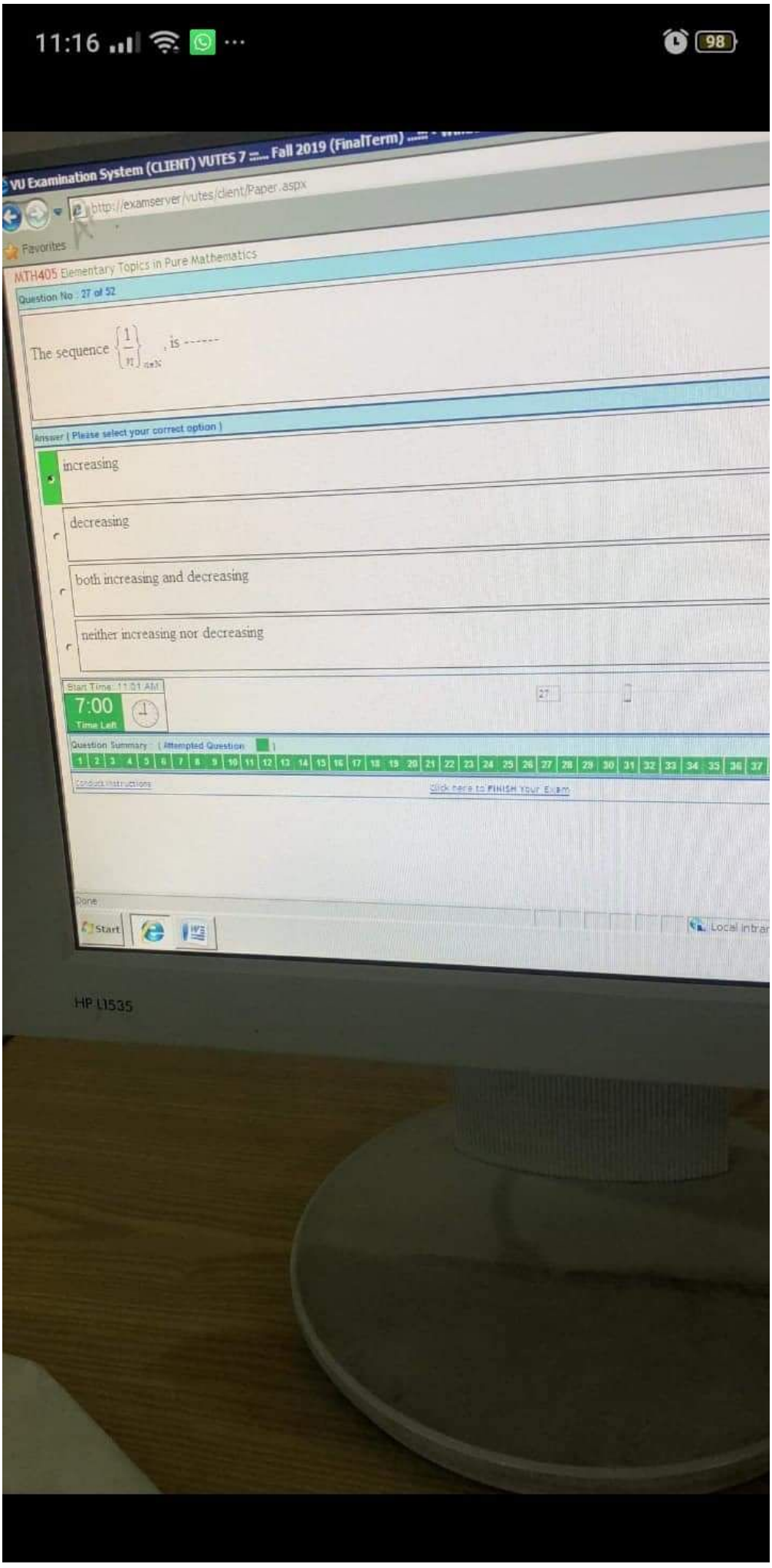
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VU Examination System (CLIENT) VUTES 7 ... Fall 2019 (FinalTerm)
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Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 27 of 52
The sequence $\left\{\frac{1}{n}\right\}_{n=1}^{\infty}$ is ------
Answer (Please select your correct option)
increasing
decreasing
both increasing and decreasing
neither increasing nor decreasing
Start Time: 11:01 AM
7:00
Time Left
Question Summary (Attempted Question)
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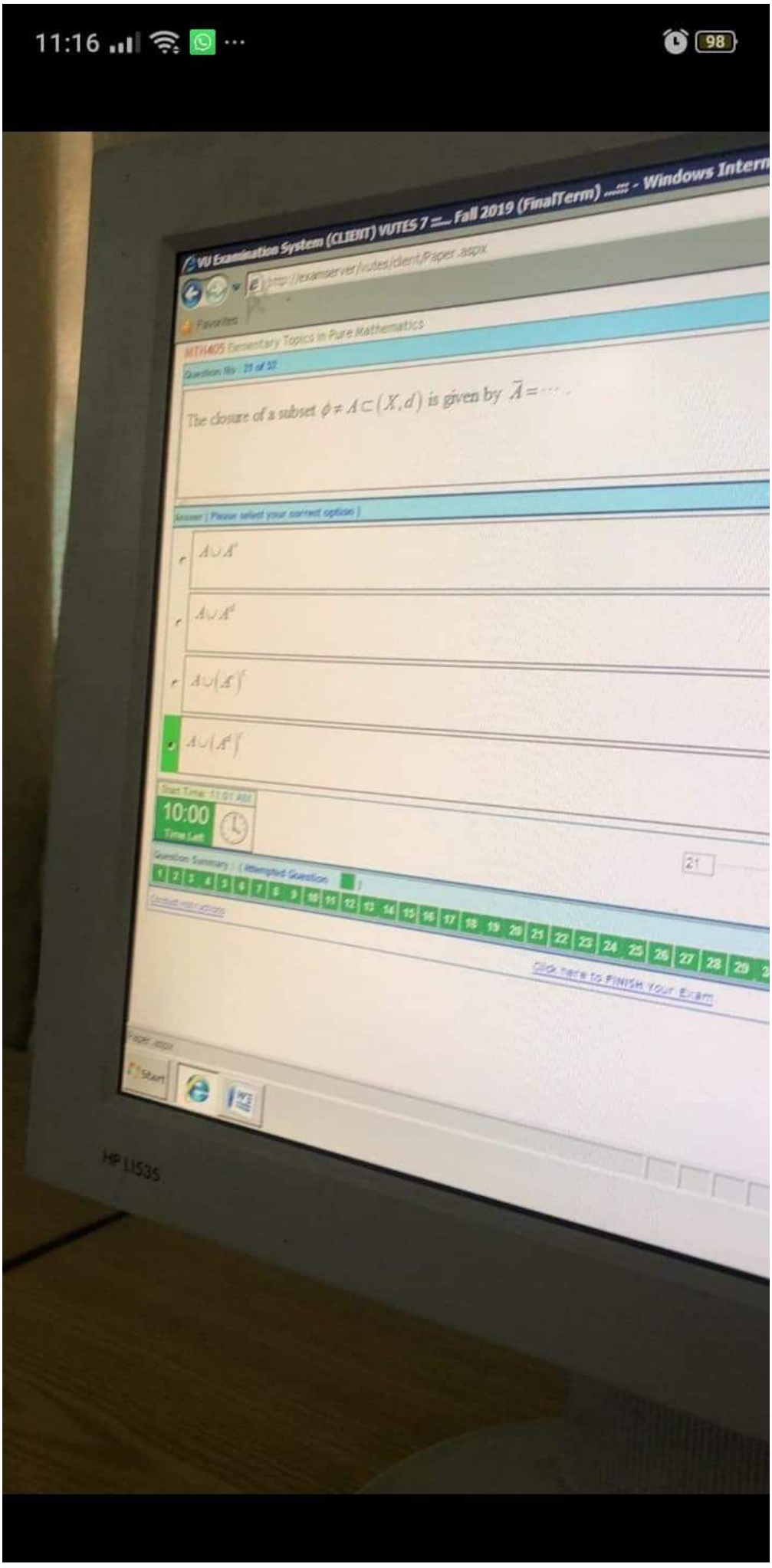
VU Examination System (CLIENT) VUTES 7 ... Fall 2019 (FinalTerm) ... - Windows Intern
MTH405 Elementary Topics in Pure Mathematics
The closure of a subset $\phi \neq A \subset (X,d)$ is given by $\bar{A} = \cdots$.
$A \cup A'$
$A \cup A^{d}$
$A \cup (A)'$
$A \cup (A')'$
10:00
Time Left
21
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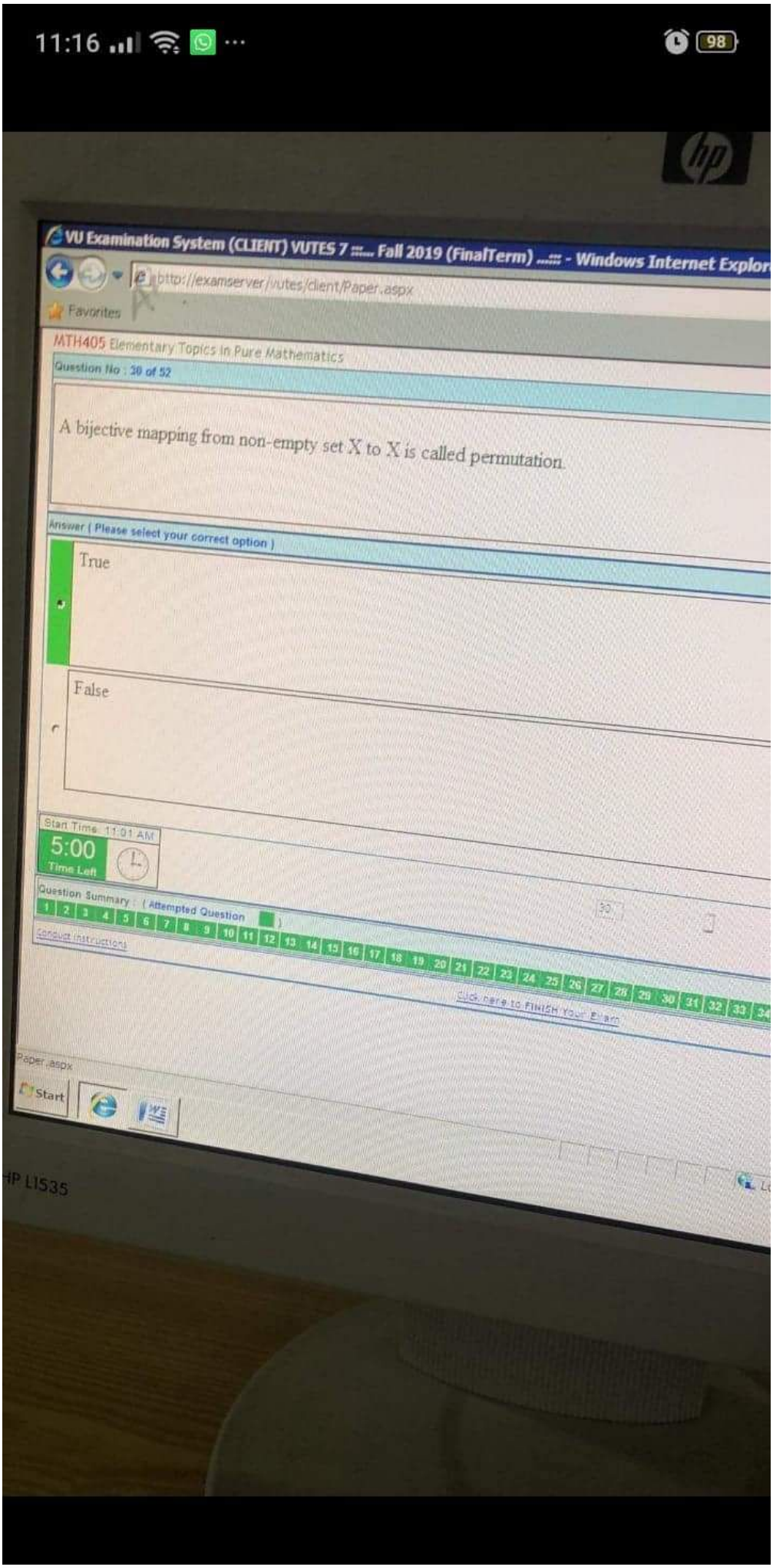
VU Examination System (CLIENT) VUTES 7 ..... Fall 2019 (FinalTerm) .....:: - Windows Internet Explor
http://examserver/vutes/client/Paper.aspx
Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 30 of 52
A bijective mapping from non-empty set X to X is called permutation.
Answer (Please select your correct option)
True
False
Start Time: 11:01 AM
5:00
Time Left
Question Summary : (Attempted Question)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34
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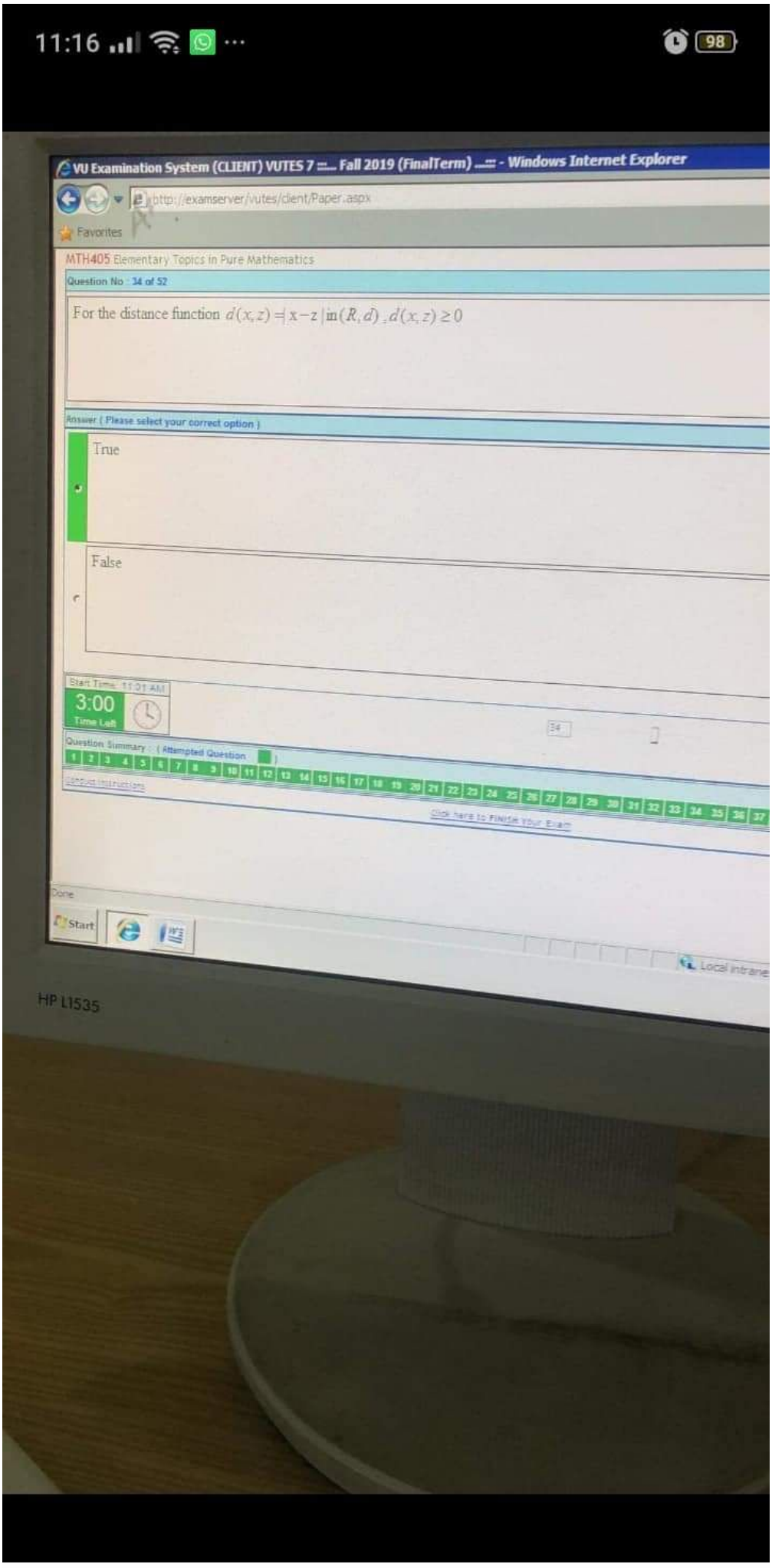
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MTH405 Elementary Topics in Pure Mathematics
Question No : 34 of 52
For the distance function $d(x,z) = |x-z|$ in (R,d), $d(x,z) \geq 0$
Answer (Please select your correct option)
True
False
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Question Summary : (Attempted Question)
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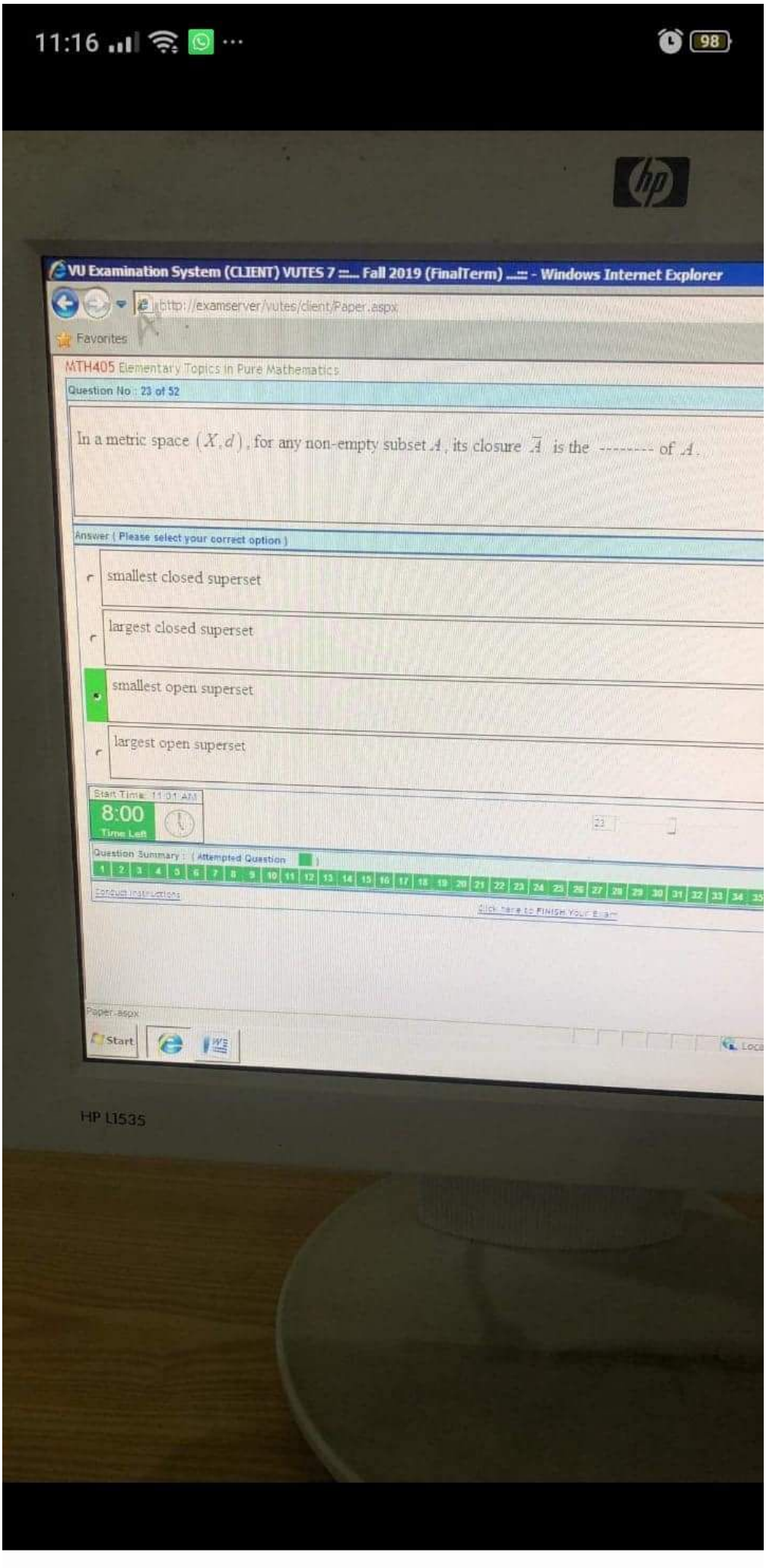
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MTH405 Elementary Topics in Pure Mathematics
Question No : 23 of 52
In a metric space (X,d), for any non-empty subset A, its closure $\overline{A}$ is the -------- of A.
Answer (Please select your correct option)
smallest closed superset
largest closed superset
smallest open superset
largest open superset
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Question Summary : (Attempted Question
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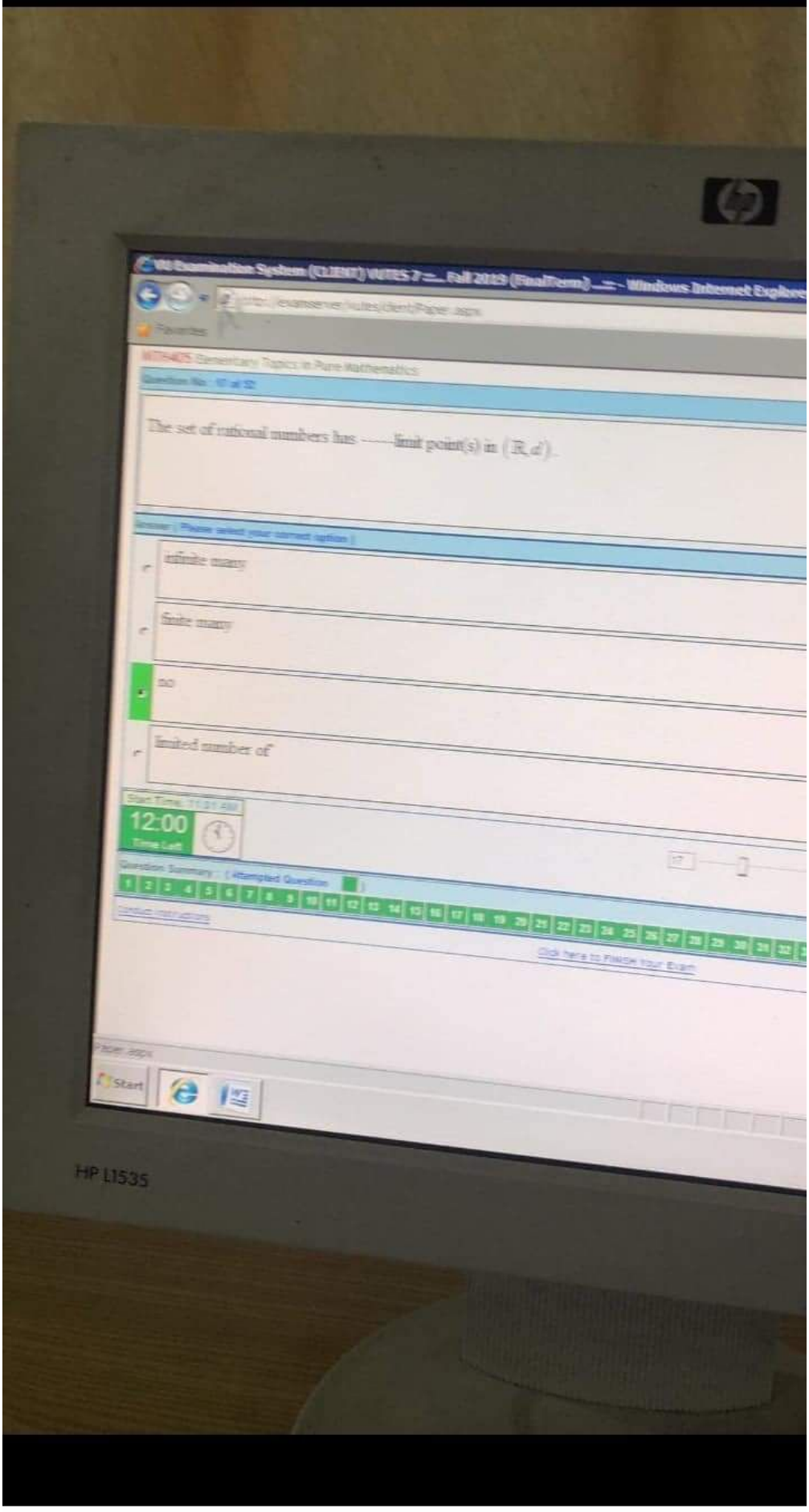
The set of rational numbers has ------limit point(s) in $(\mathbb{R}, d)$.
infinite many
finite many
no
limited number of
12:00
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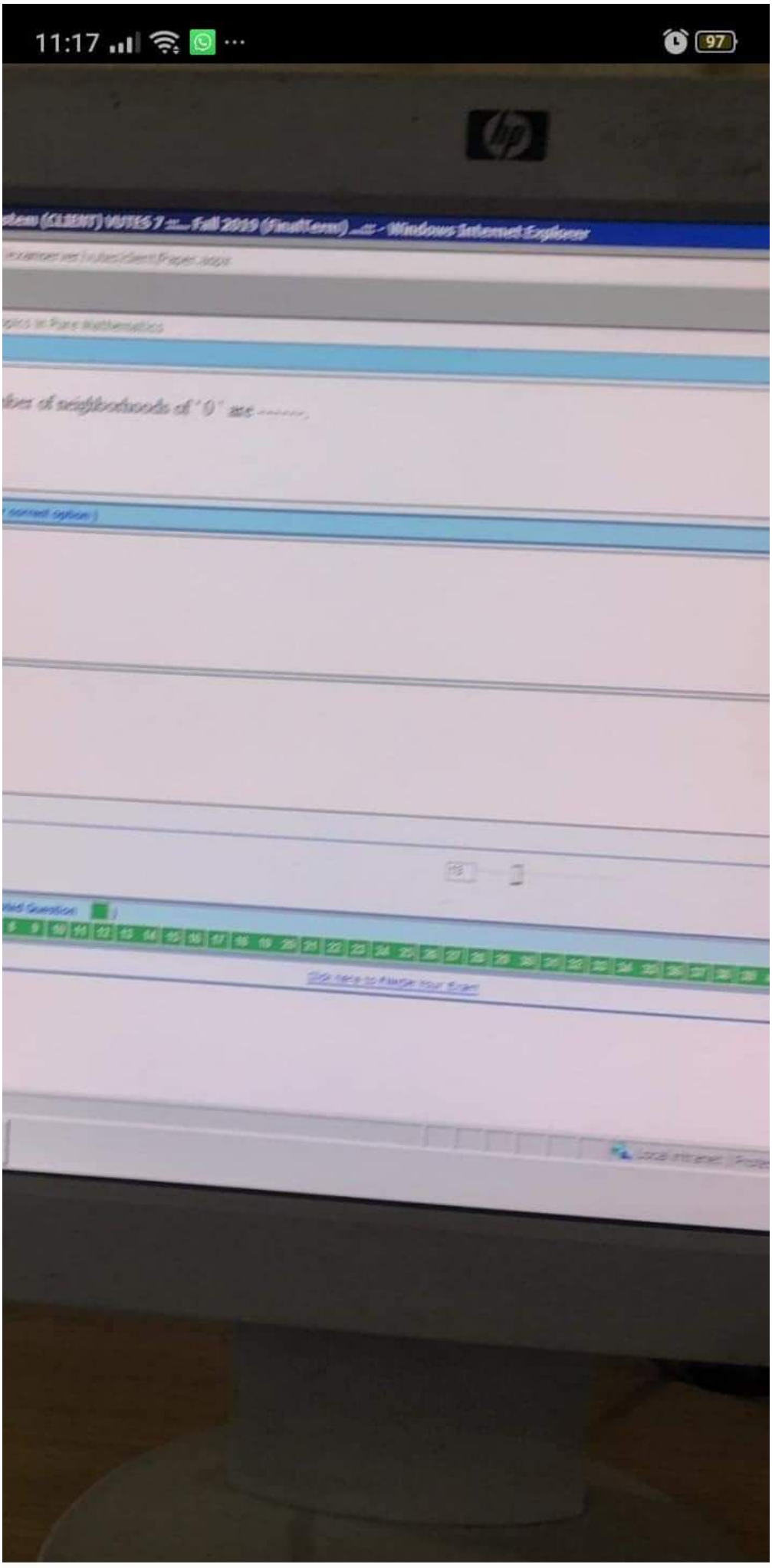
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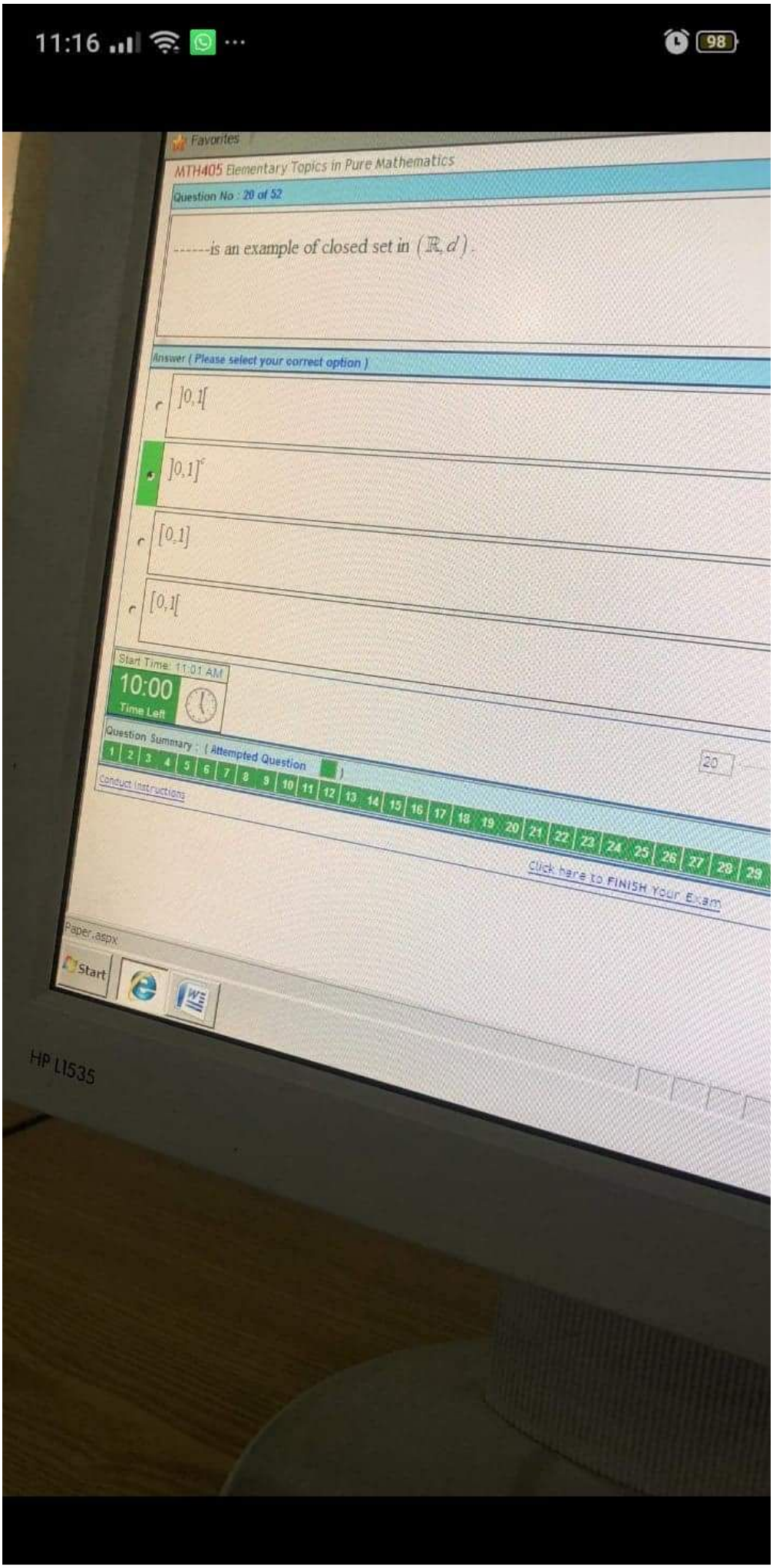
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Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 20 of 52
------is an example of closed set in $(\mathbb{R}, d)$.
Answer (Please select your correct option)
$]0,1[$
$]0,1]^c$
$[0,1]$
$[0,1[$
Start Time: 11:01 AM
10:00
Time Left
Question Summary : (Attempted Question)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
20
Conduct Instructions
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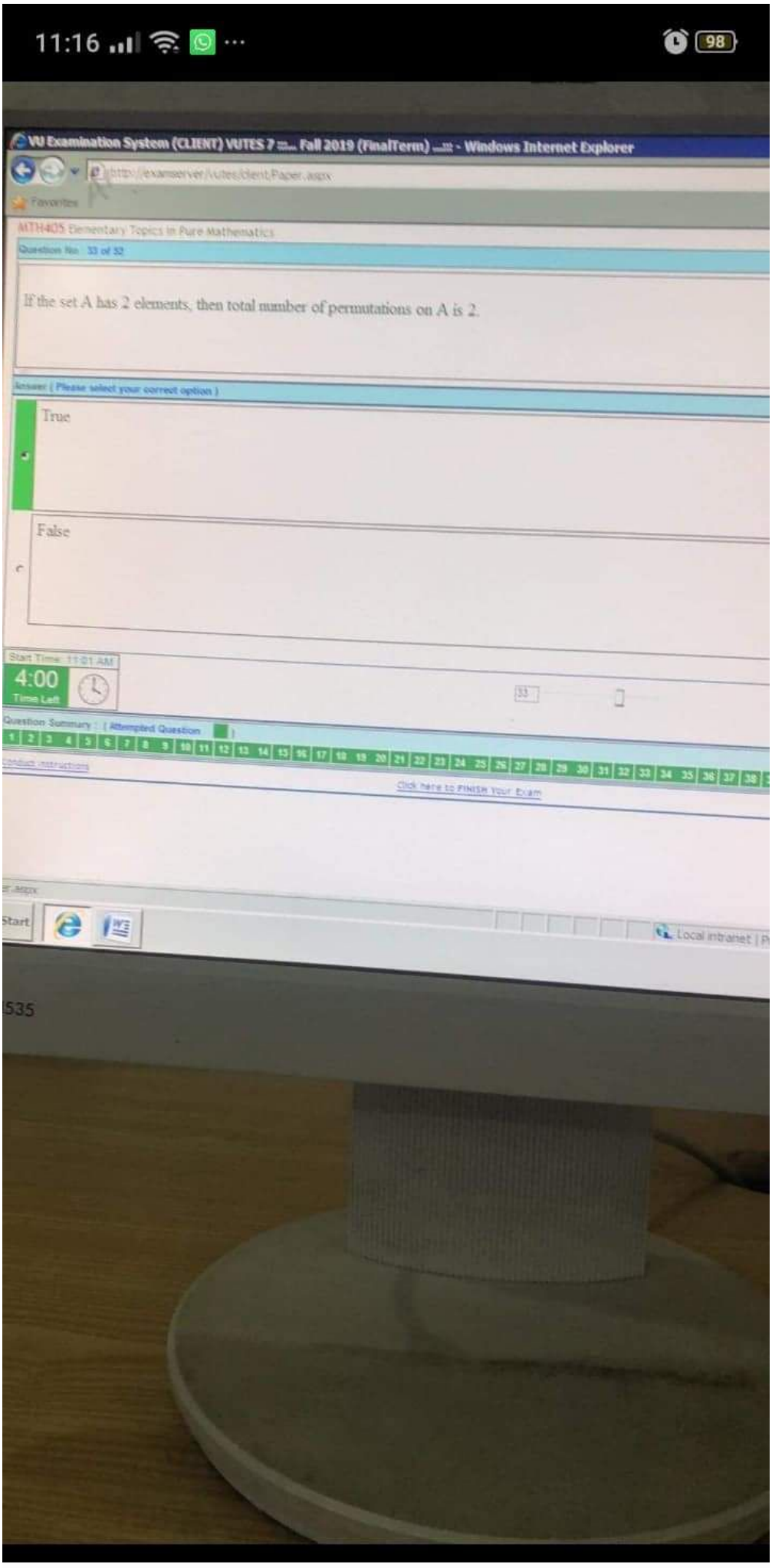
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VU Examination System (CLIENT) VUTES 7 ::... Fall 2019 (FinalTerm) ...::: - Windows Internet Explorer
MTH405 Elementary Topics in Pure Mathematics
If the set A has 2 elements, then total number of permutations on A is 2.
True
False
4:00
Time Left
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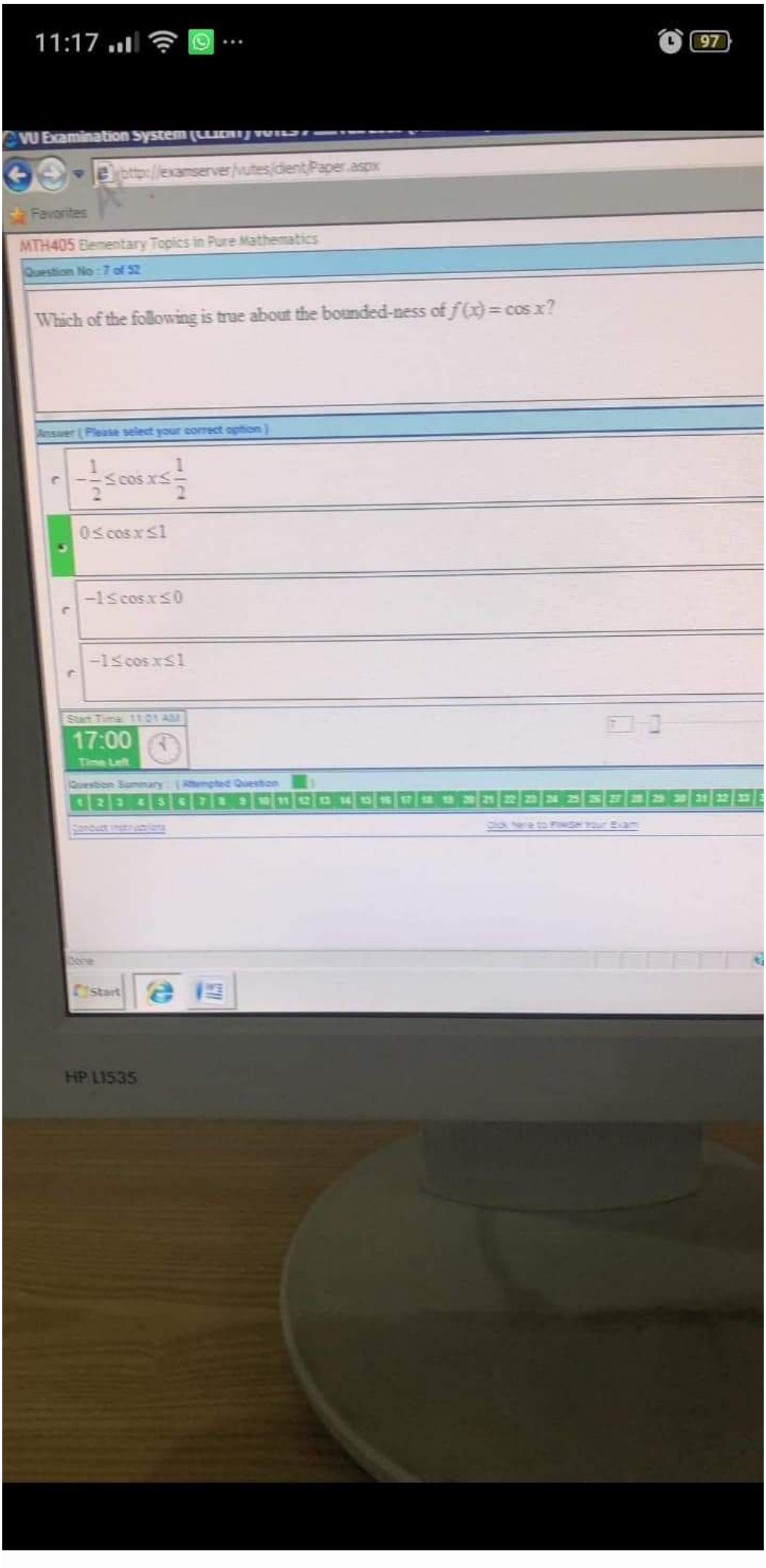
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VU Examination System
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Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 7 of 52
Which of the following is true about the bounded-ness of $f(x) = \cos x$?
Answer (Please select your correct option)
$-\frac{1}{2} \le \cos x \le \frac{1}{2}$
$0 \le \cos x \le 1$
$-1 \le \cos x \le 0$
$-1 \le \cos x \le 1$
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Question Summary : (Attempted Question)
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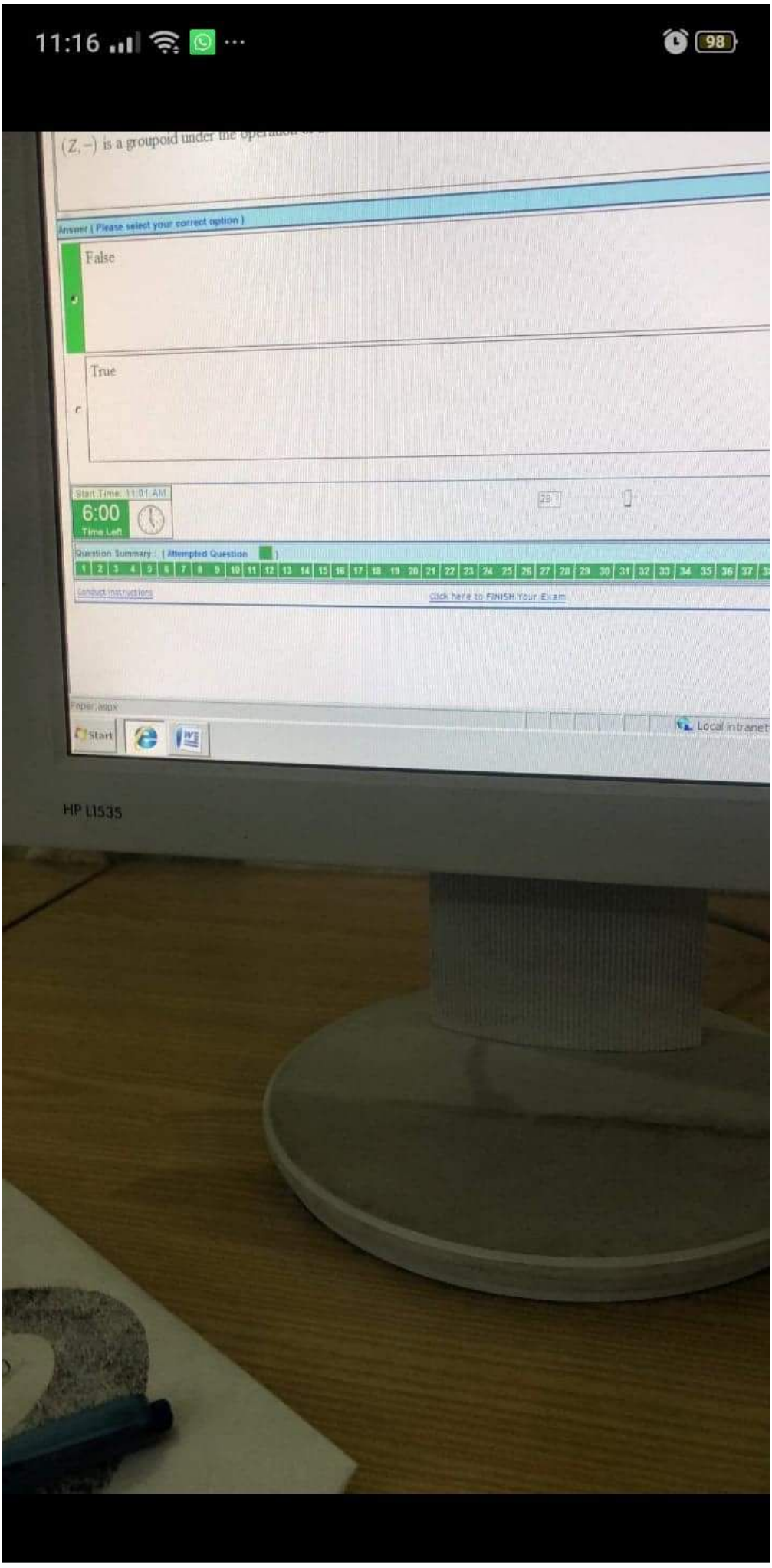
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98
(Z, −) is a groupoid under the
Answer (Please select your correct option)
False
True
Start Time: 11:01 AM
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Time Left
Question Summary (Attempted Question)
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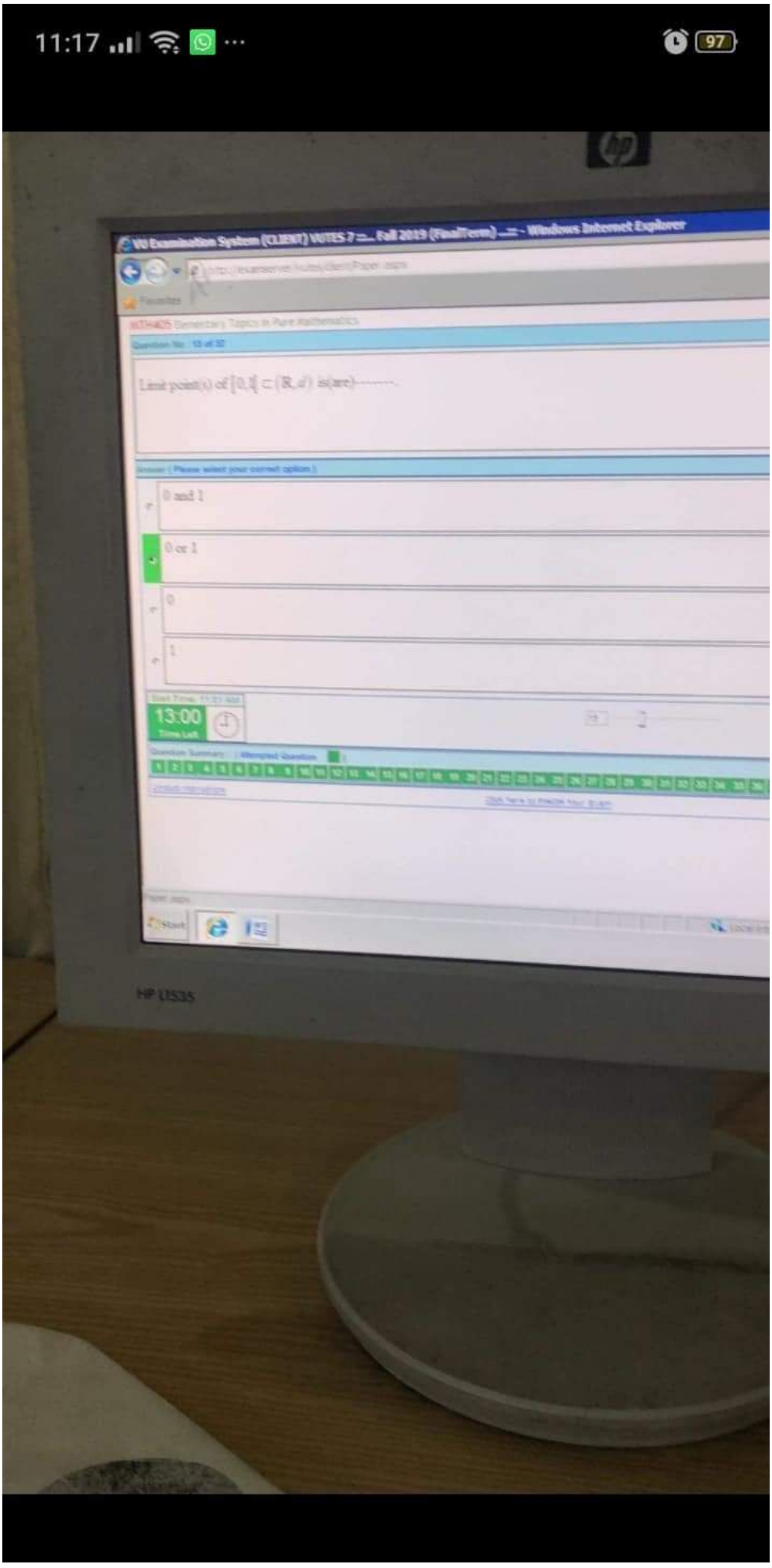
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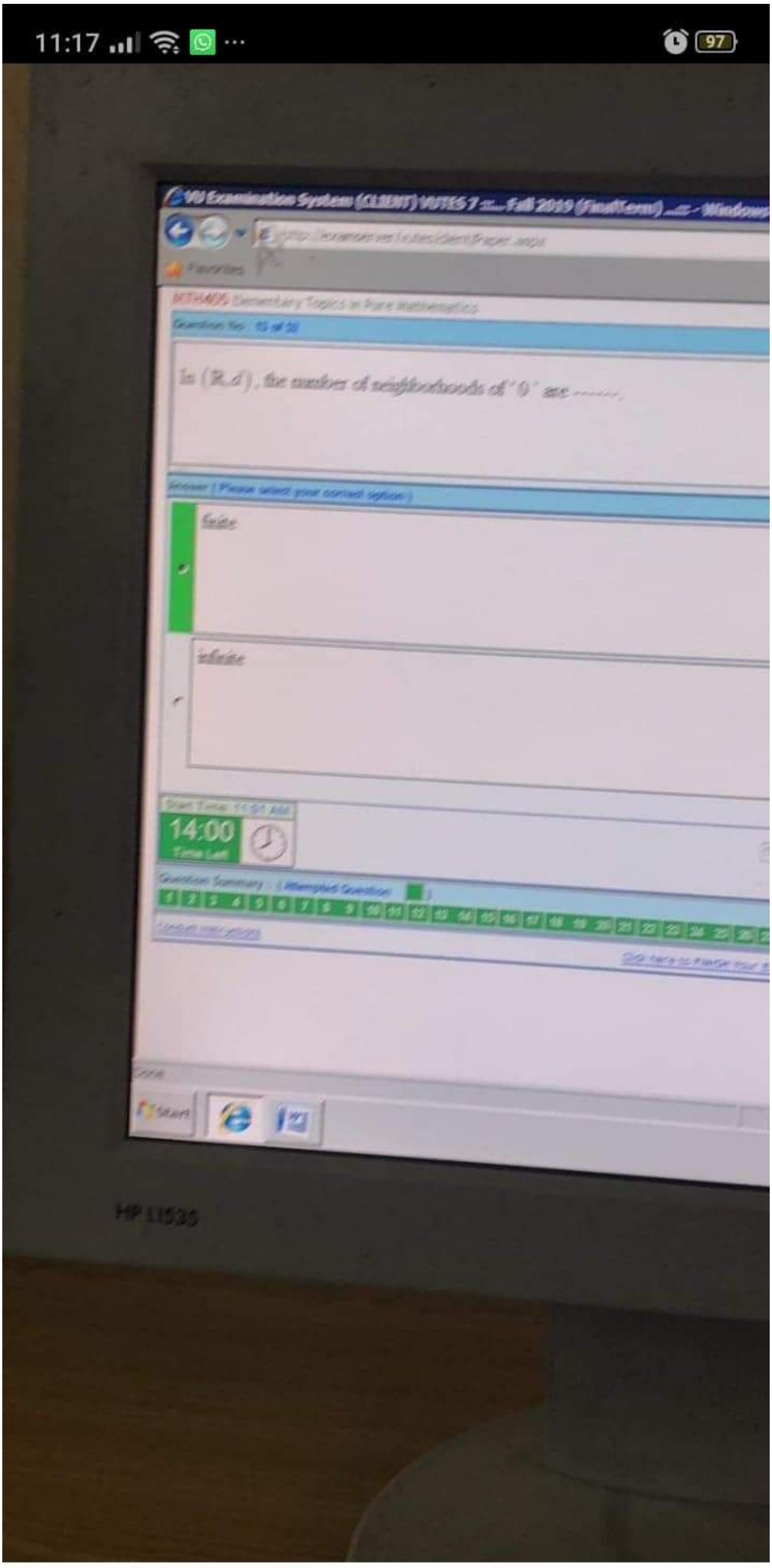
VU Examination System (CLIENT) WITES 7 :... Fall 2019 (FinalTerm) ... - Windows Internet Explorer
Limit point(s) of $[0,1[\subset (\mathbb{R}, d)$ is(are)------
0 and 1
0 or 1
0
1
13:00
HP L1535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VU Examination System (CLIENT) VUTES7 ... Fall 2019 (FinalTerm) ... - Windows
MTH405 Elementary Topics in Pure Mathematics
In $(\mathbb{R}, d)$, the number of neighborhoods of '0' are .....
finite
infinite
14:00
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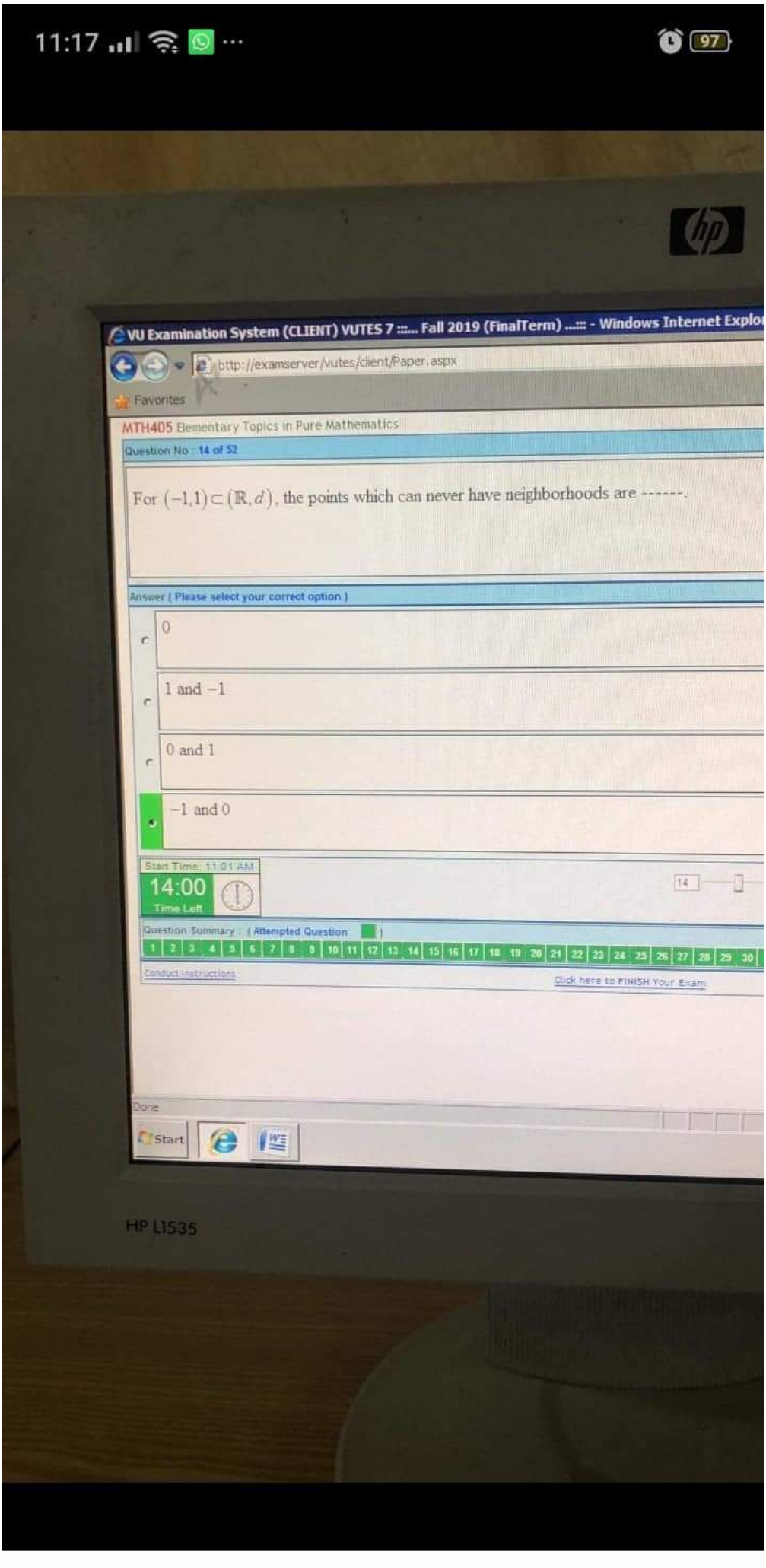
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Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 14 of 52
For $(-1,1) \subset (\mathbb{R}, d)$, the points which can never have neighborhoods are ------.
Answer (Please select your correct option)
0
1 and −1
0 and 1
−1 and 0
Start Time: 11:01 AM
14:00
Time Left
14
Question Summary : (Attempted Question)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Conduct Instructions
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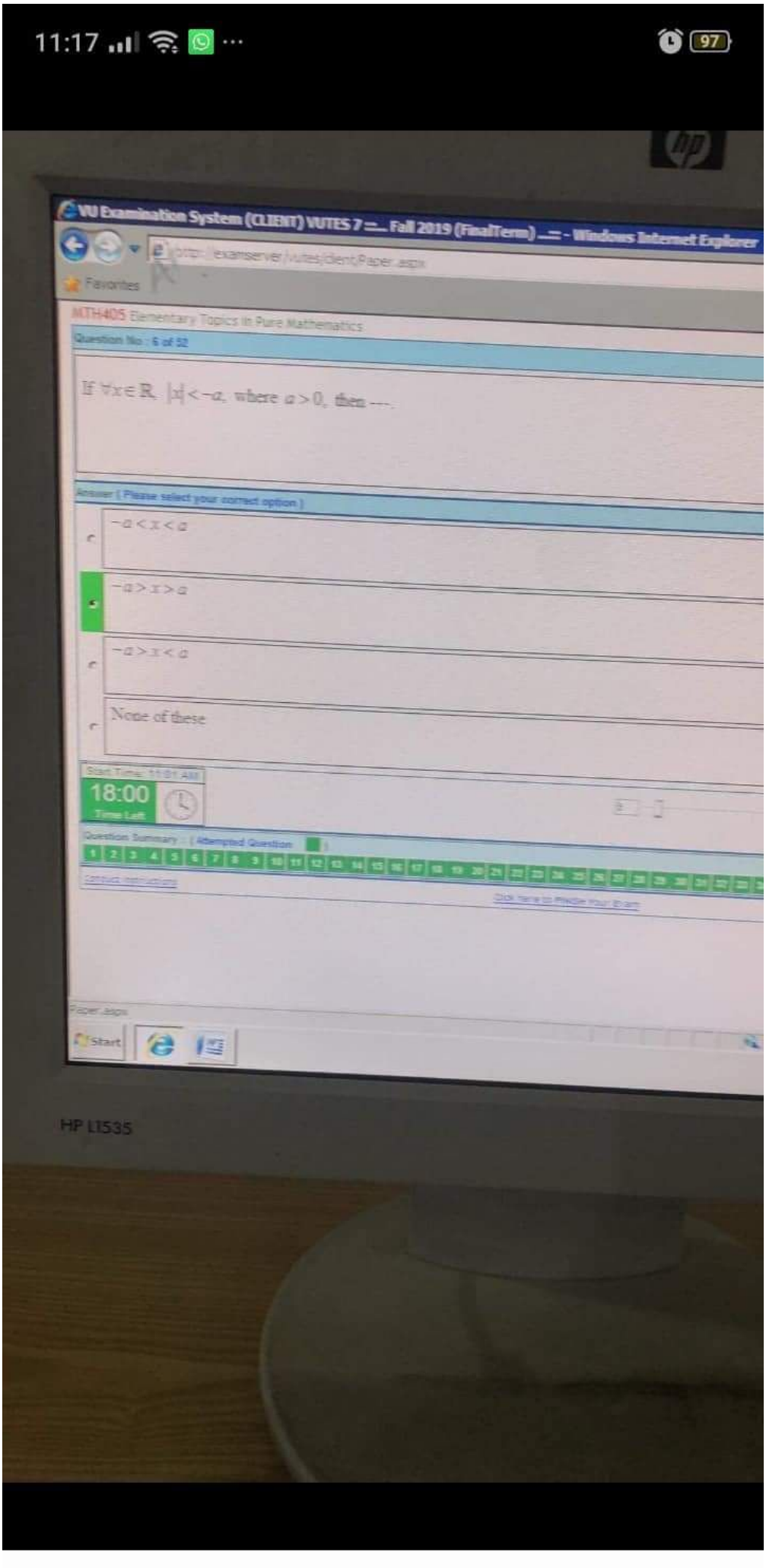
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VU Examination System (CLIENT) VUTES 7 — Fall 2019 (FinalTerm) — Windows Internet Explorer
Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 6 of 52
If $\forall x \in \mathbb{R}$, $|x| < -a$, where $a > 0$, then ---.
Answer (Please select your correct option)
$-a < x < a$
$-a > x > a$
$-a > x < a$
None of these
18:00
Time Left
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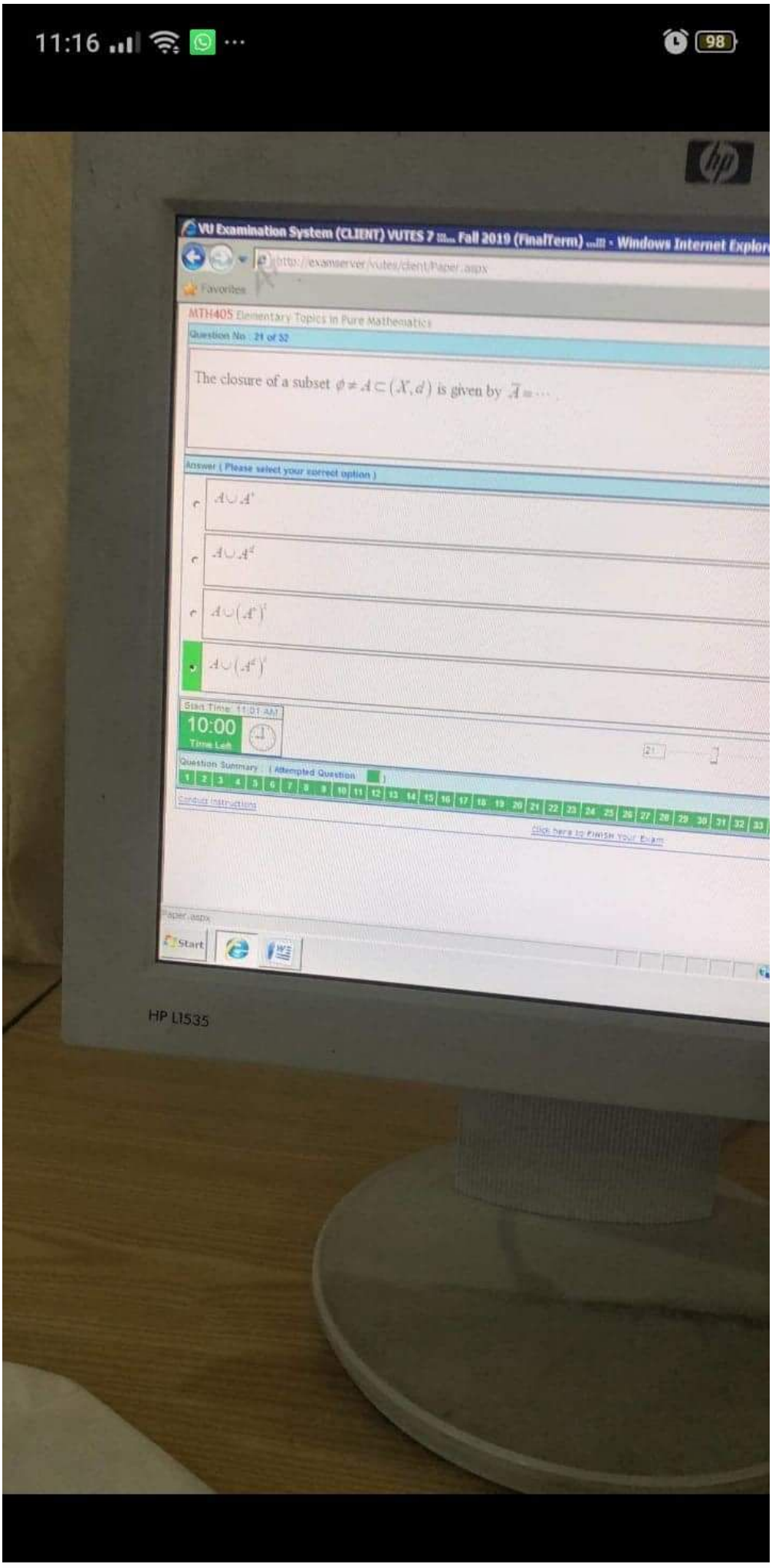
VU Examination System (CLIENT) VUTES 7 ... Fall 2019 (FinalTerm) ... - Windows Internet Explor
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Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 21 of 32
The closure of a subset $\phi \neq A \subset (X,d)$ is given by $\bar{A} = \cdots$
Answer (Please select your correct option)
$A \cup A'$
$A \cup A^d$
$A \cup (A')'$
$A \cup (A^d)'$
Start Time: 11:01 AM
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Question Summary (Attempted Question)
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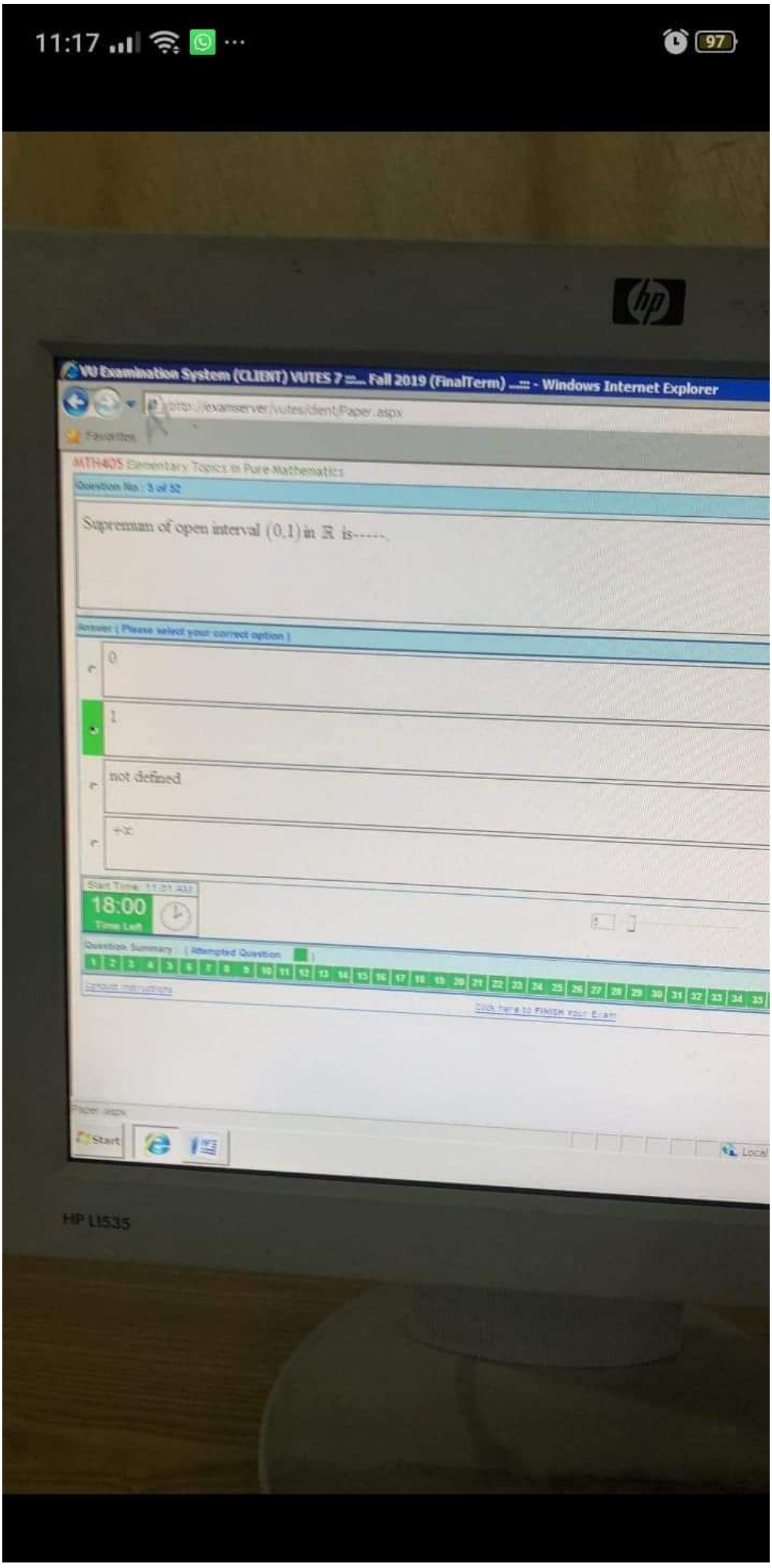
VU Examination System (CLIENT) VUTES 7 ... Fall 2019 (FinalTerm) ... - Windows Internet Explorer
MTH405 Elementary Topics in Pure Mathematics
Supremum of open interval (0,1) in R is-----
0
1
not defined
+∞
18:00
Time Left
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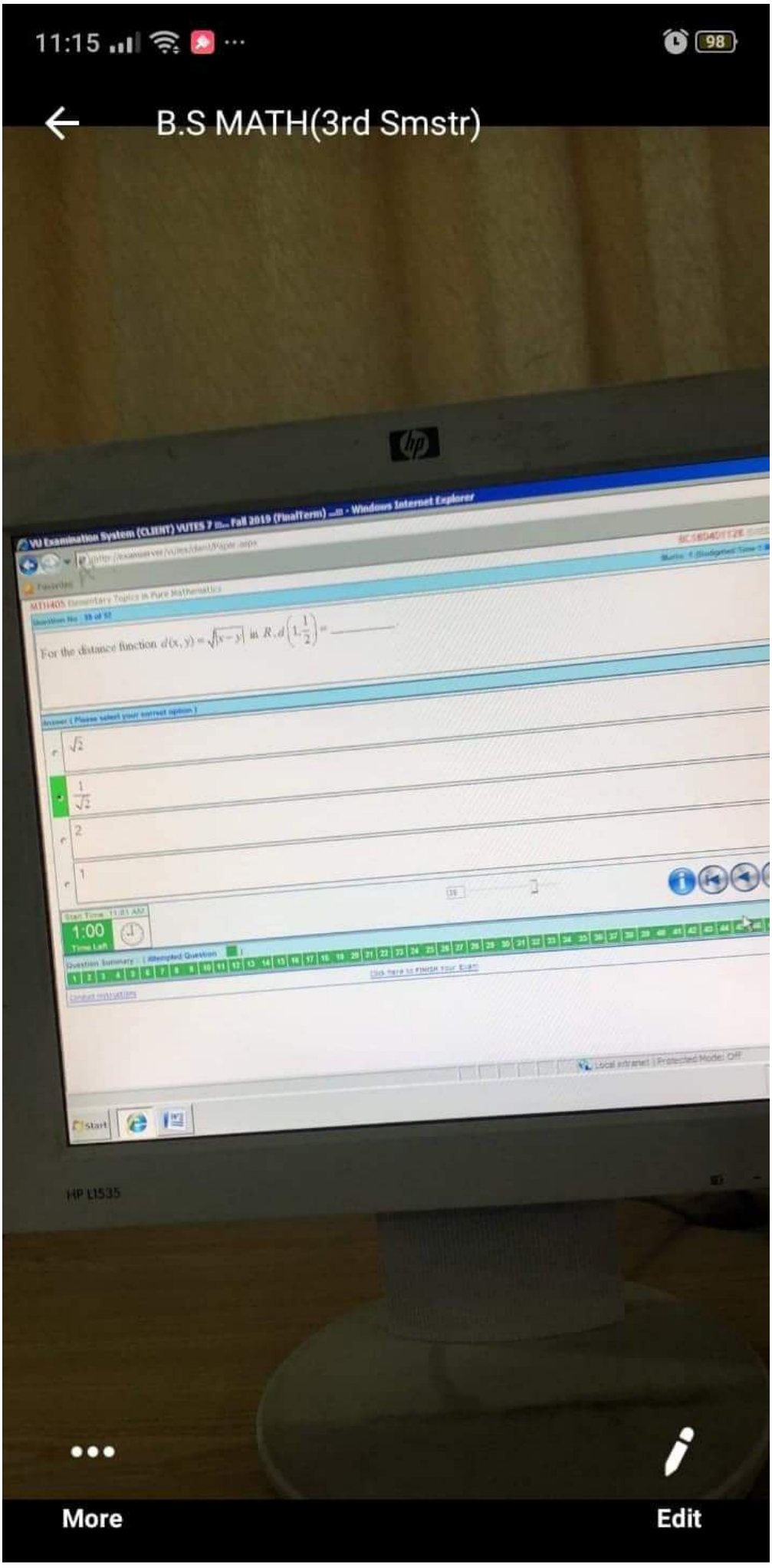
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B.S MATH(3rd Smstr)
VU Examination System (CLIENT) VUTES 7 ... Fall 2019 (FinalTerm) ... - Windows Internet Explorer
MT1405 Elementary Topics in Pure Mathematics
For the distance function $d(x,y)=\sqrt{|x-y|}$ in $R, d\left(1,\frac{1}{2}\right)=$ _____
Answer (Please select your correct option)
$\sqrt{2}$
$\frac{1}{\sqrt{2}}$
2
1
1:00
Time Left
Question Summary
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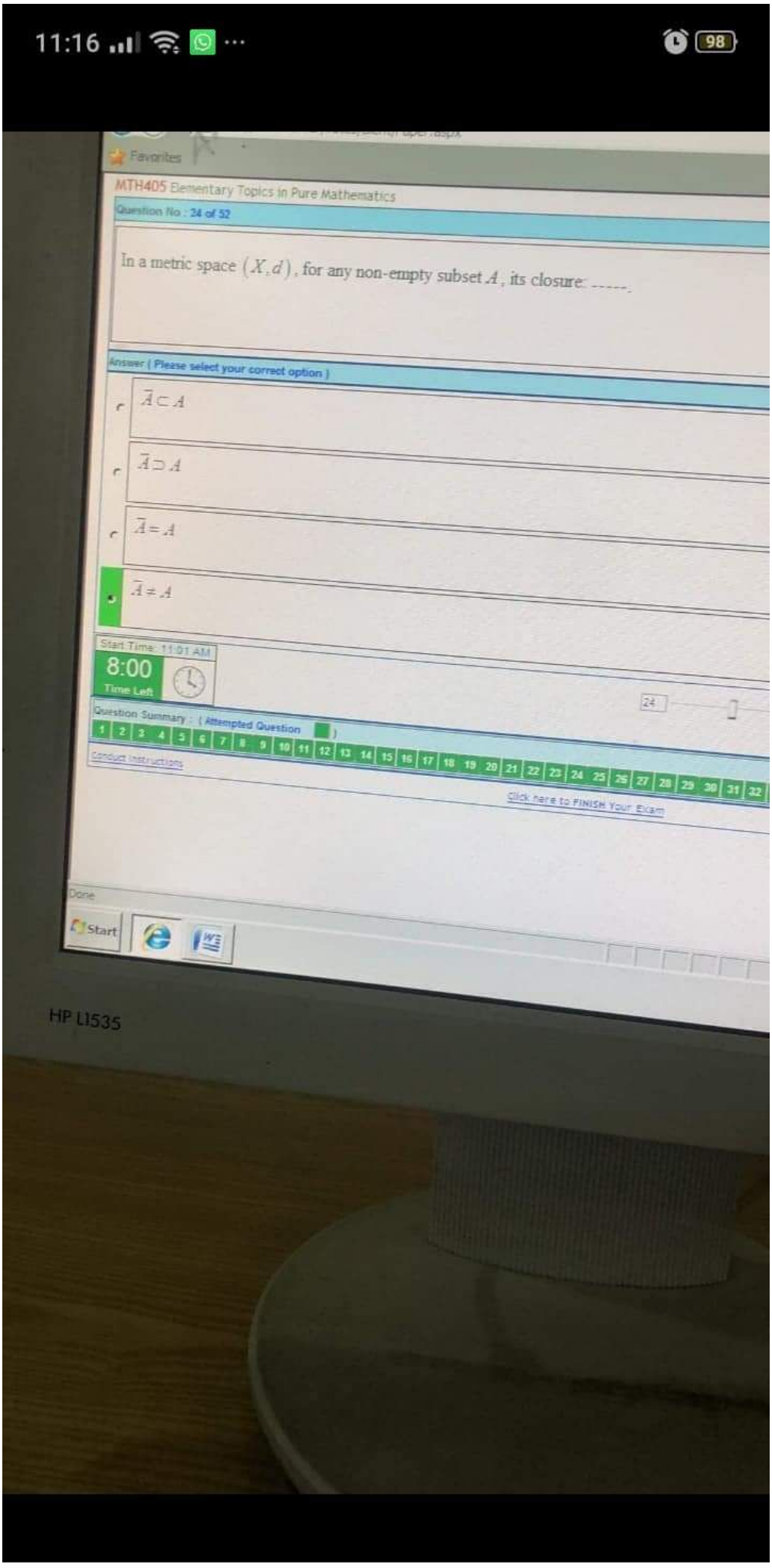
11:16
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Favorites
MTH405 Elementary Topics in Pure Mathematics
Question No : 24 of 52
In a metric space (X,d), for any non-empty subset A, its closure: -----.
Answer (Please select your correct option)
$\bar{A} \subset A$
$\bar{A} \supset A$
$\bar{A} = A$
$\bar{A} \neq A$
Start Time: 11:01 AM
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Time Left
Question Summary : (Attempted Question)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Conduct Instructions
Click here to FINISH Your Exam
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HP L1535

MTH405 Elementary Topics in Pure Mathematics

Question No : 1 of 52

BC200418371 (MUNAWAR AL

Marks: 1 (Budgeted Time 1 Min)

If d is a usual(natural) metric on $\mathbb{R}$, then $d(1,1) = ----$.

Answer (Please select your correct option)

- (•) 1
- ( ) 2
- ( ) 0
- ( ) 0.50

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MTH405 Elementary Topics in Pure Mathematics

Question No : 2 of 52

BC200418371 (MUNAWAR

Marks: 1 (Budgeted Time 1 Min)

If d_0 is a discrete metric on $\mathbb{R}$, then $d_0(-1,1) =$ - - - - -

Answer [Please select your correct option]

- 1
- -1
- 2
- 0

Start Time: 8:05 AM

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Test Question

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VUTES 1.2 Fall 2021 (F...

MathType - Untitled 1

Question No : 3 of 52

BC200418371 (MUNAWAR ALI)

Marks: 1 (Budgeted Time 1 Min)

For the distance function $d(x,y)=\sqrt{|x-y|}$ in $(\mathbb{R},d)$, $d(x,y)=$ ----

Answer (Please select your correct option)

- $d(x,-y)$
- $d(-x,y)$
- $d\left(\frac{1}{x},\frac{1}{y}\right)$
- $d(y,x)$

Start Time 8:05 AM

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Next Question

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VUTES 7.2 Fall 2021 (F...

MathType - Untitled 1

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Favorites

MTH405 Elementary Topics in Pure Mathematics

BC200418371

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)

If $k_1, k_2, \cdots, k_n \geq 0$, then $max\{k_i, 1 \leq i \leq n, n \in \square\} \cdots 0$

Answer (Please select your correct option)

- $\geq$
- $\leq$
- $=$
- $\neq$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 4 of 52

BC200418371 (MUNAWAR

Marks: 1 (Budgeted Time 1 Min)

If $f(x)=1, g(x)=2 \in \mathcal{C}[1,0]$, then the distance as defined by $d(f,g)=\int_0^1 |f(x)-g(x)|dx=\cdots$

Answer (Please select your correct option)

- 2
- 1
- -1
- 0

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MTH405 Elementary Topics in Pure Mathematics

Question No : 6 of 52

BC200418371 (MUNAWAR A

Marks: 1 (Budgeted Time 1 Min)

Maximum of open interval (0,1) is [ ] is------

Answer (Please select your correct option)

0

1

not defined

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MTH405 Elementary Topics in Pure Mathematics

Question No : 8 of 52

BC200418371

Marks: 1 (Budgeted Time 1 Min)

If $\forall x \in \mathbb{R}$, $|x| > -a$, where $a > 0$, then ----

Answer (Please select your correct option)

- $x < a$ and $x > -a$
- $x < -a$ and $x > a$
- $-\infty < x < \infty$
- $-\infty < x < a$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 7 of 52

BC200418371 (MUNAWAR ALI)

Marks: 1 (Budgeted Time 1 Min)

If $\forall x \in \mathbb{R}$, $|x| > -a$, where $a < 0$, then ----

Answer (Please select your correct option)

- $x < a$ and $x > -a$
- $x < -a$ and $x > a$
- $x < a$ and $x > a$
- $x < -a$ and $x > -a$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 9 of 52

BC200418371

Marks: 1 (Budgeted Time 1 Min)

$\forall a_j, b_j \in \mathbb{R}, \sqrt{\sum_{j=1}^{n}(a_j + b_j)^2}$ ----

Answer (Please select your correct option)

- $\geq \sqrt{\sum_{j=1}^{n} a_j^2} + \sqrt{\sum_{j=1}^{n} b_j^2}$
- $\leq \sqrt{\sum_{j=1}^{n} a_j^2} + \sqrt{\sum_{j=1}^{n} b_j^2}$
- $= \sqrt{\sum_{j=1}^{n} a_j^2} + \sqrt{\sum_{j=1}^{n} b_j^2}$
- $= \sum_{j=1}^{n} a_j + \sum_{j=1}^{n} b_j$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 10 of 52

BC200

Marks: 1 (Budgeted Time 1 Min)

A metric space (X,d) is bounded if $\exists M>0$, such that $d(x,y)----M, \forall x,y \in X$

Answer (Please select your correct option)

- $\neq$
- $=$
- $\geq$
- $\leq$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 11 of 52

BC200418371

Marks: 1 (Budgeted Time 1 Min)

Which of the following is true about an open sphere $S_r(x_0)$ with center at x_0 in a metric space (X,d)?

Answer (Please select your correct option)

- $S_r(x_0) = \phi$
- $S_r(x_0) \neq \phi$
- $S_r(x_0) \subset \phi$
- $X \subset S_r(x_0)$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 12 of 52

BC20041

Marks: 1 [Negative Time: 1 Min]

$S_1(0)$ is an open interval on $\mathbb{R}$ under usual metric $d(x,y)=|x-y|$ having interval length equals to

Answer (Please select your correct option)

- 0
- 0.50
- 1
- 2

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MTH405 Elementary Topics in Pure Mathematics

Question No : 13 of 52

BC200418371 (MUNAWA

Marks: 1 (Budgeted Time 1 Min)

On $(\mathbb{R}, d)$, the compliment of singleton $\{0\}$ is ---- set

Answer (Please select your correct option)

- a closed
- an open
- both open and closed
- neither open nor closed

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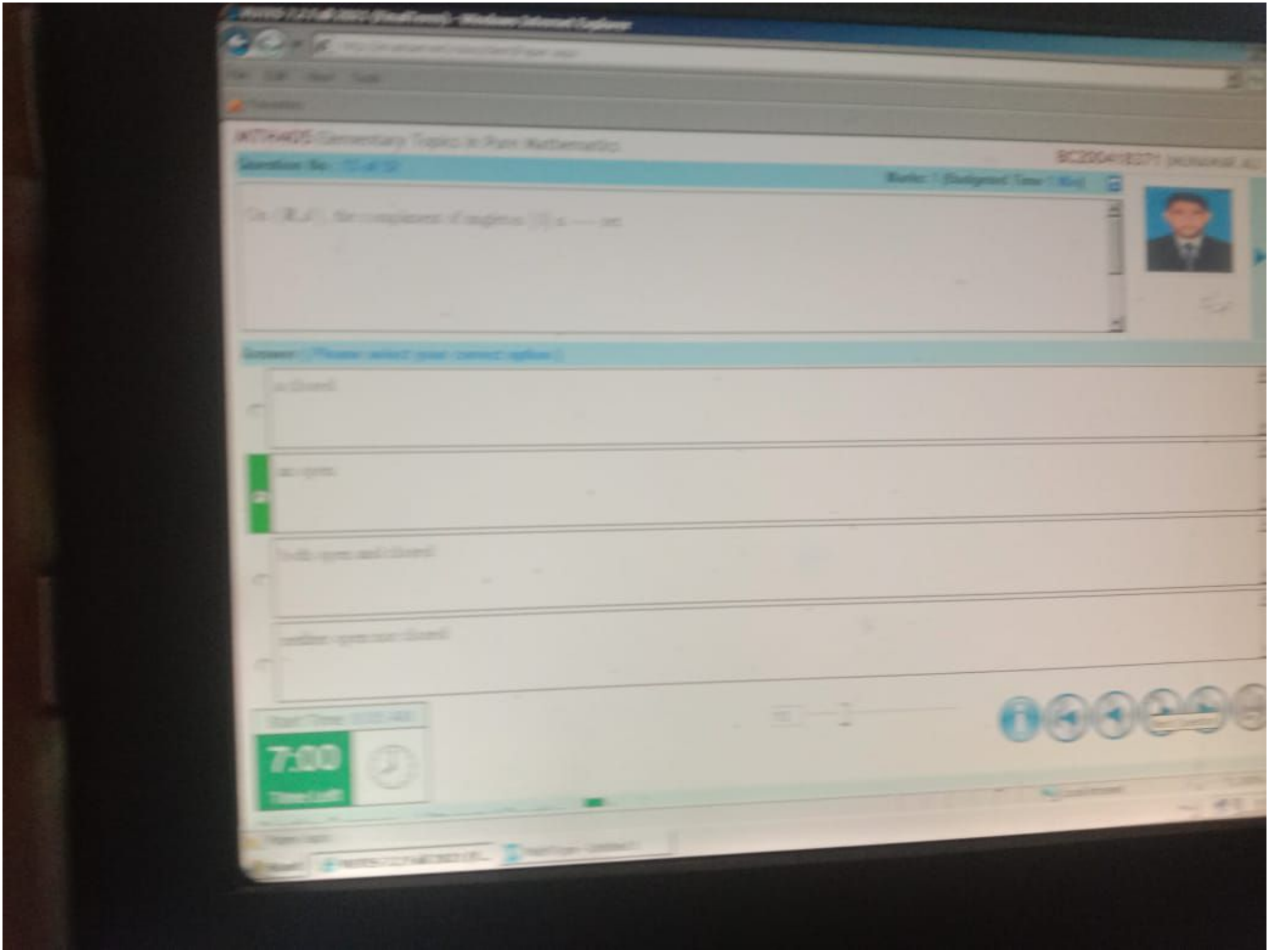

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MTH405 Elementary Topics in Pure Mathematics

Question No : 14 of 52

BC200418371 (MUNAWAR ALI)

Marks: 1 (Budgeted Time 1 Min)

If $x \in]-1,1[\subset (\mathbb{R}, d)$ and $r = \min\{|1-x|, |-1-x|\}$, then the open sphere

Answer (Please select your correct option)

- $S_r(x) \supset]-1,1[$
- $S_r(x) =]-1,1[$
- $S_r(x) \subset]-1,1[$
- $S_r(x) = \emptyset$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 15 of 52

BC200418371 (MUNAWAR ALI)

Marks: 1 (Budgeted Time 1 Min)

In $(\mathbb{R}, d)$, the number of neighborhoods of "0" are ------

Answer (Please select your correct option)

finite

infinite

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MTH405 Elementary Topics in Pure Mathematics

Question No : 16 of 52

BC200418371 (MUNAWAR A

Marks: 1 (Budgeted Time 1 Min)

0 and 1 are the limit points of ------- $\subset (\mathbb{R}, d)$

Answer (Please select your correct option)

- $(0,1)$
- $[0,1]$
- $]0,1]$
- All choices are true

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MTH405 Elementary Topics In Pure Mathematics

Question No : 17 of 52

BC200418371 (MUNA

Marks: 1 (Budgeted Time 1 Min)

Number of limit points for $(x_1, x_2, \ldots, x_n) \subset (X, d)$ are-----

Answer (Please select your correct option)

- n
- $n+1$
- $n-1$
- None

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MTH405 Elementary Topics in Pure Mathematics

Question No : 22 of 52 BC200418371

Marks: 1 (Budgeted Time 1 Min)

If $\phi \neq A \subset (X,d)$, then the $Ext(A) = \cdots$

Answer (Please select your correct option)

- $\{x \in A \mid \forall x\ \exists r_x > 0 \text{ so that } S_r(x) \subset A\}$
- $\{x \in A \mid \exists x \text{ and } \forall r_x > 0 \text{ so that } S_r(x) \subset A\}$
- $\{x \in A^c \mid \exists x \text{ and } \forall r_x > 0 \text{ so that } S_r(x) \subset A^c\}$
- $\{x \in A^c \mid \forall x\ \exists r_x > 0 \text{ so that } S_r(x) \subset A^c\}$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 23 of 52

BC200418

Marks: 1 (Budgeted Time: 1 Min)

The limit of a convergent sequence in a metric space (X,d) .....

Answer (Please select your correct option)

- is unique
- may have multiple values
- is always positive
- is always real valued

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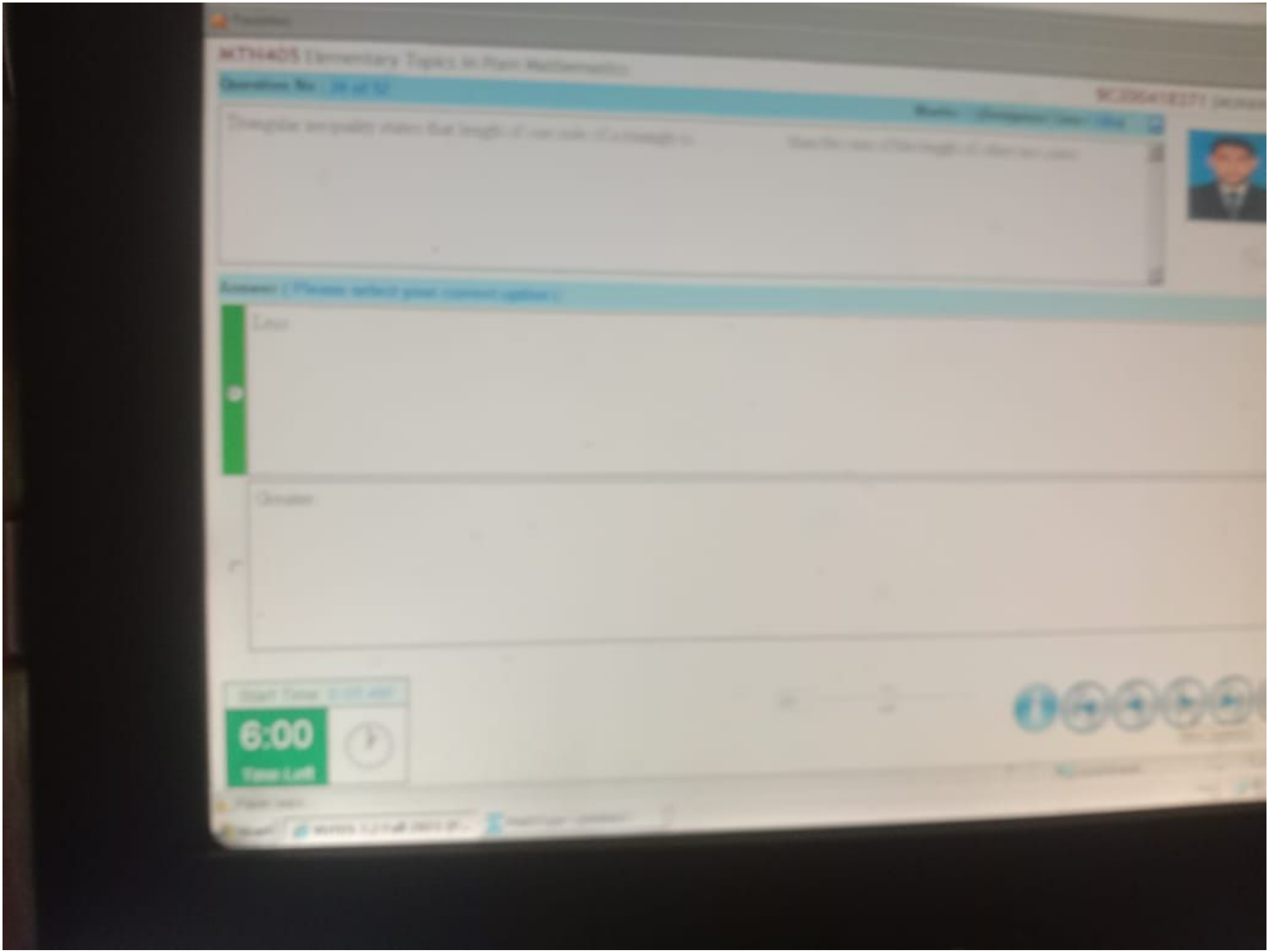
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MTH405 Elementary Topics in Pure Mathematics

Question No : 26 of 52

BC200418371 (MUNAWAR A

Marks: 1 (Budgeted Time 1 Min)

Euclidean metric on $\mathbb{R}$ is defined by

Answer (Please select your correct option)

- $d(x,y)=|x-y|$
- $d(x,y)=|x|-|y|$
- $d(x,y)=|x|+|y|$
- $d(x,y)=\sqrt{|x-y|}$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 25 of 52

BC200418371 (

Marks: 1 (Budgeted Time 1 Min)

For the distance function $d(x,z)=|x-z|$ in $(\mathbb{R},d)$, $d(x,z)\geq 0$

Answer (Please select your correct option)

- True
- False

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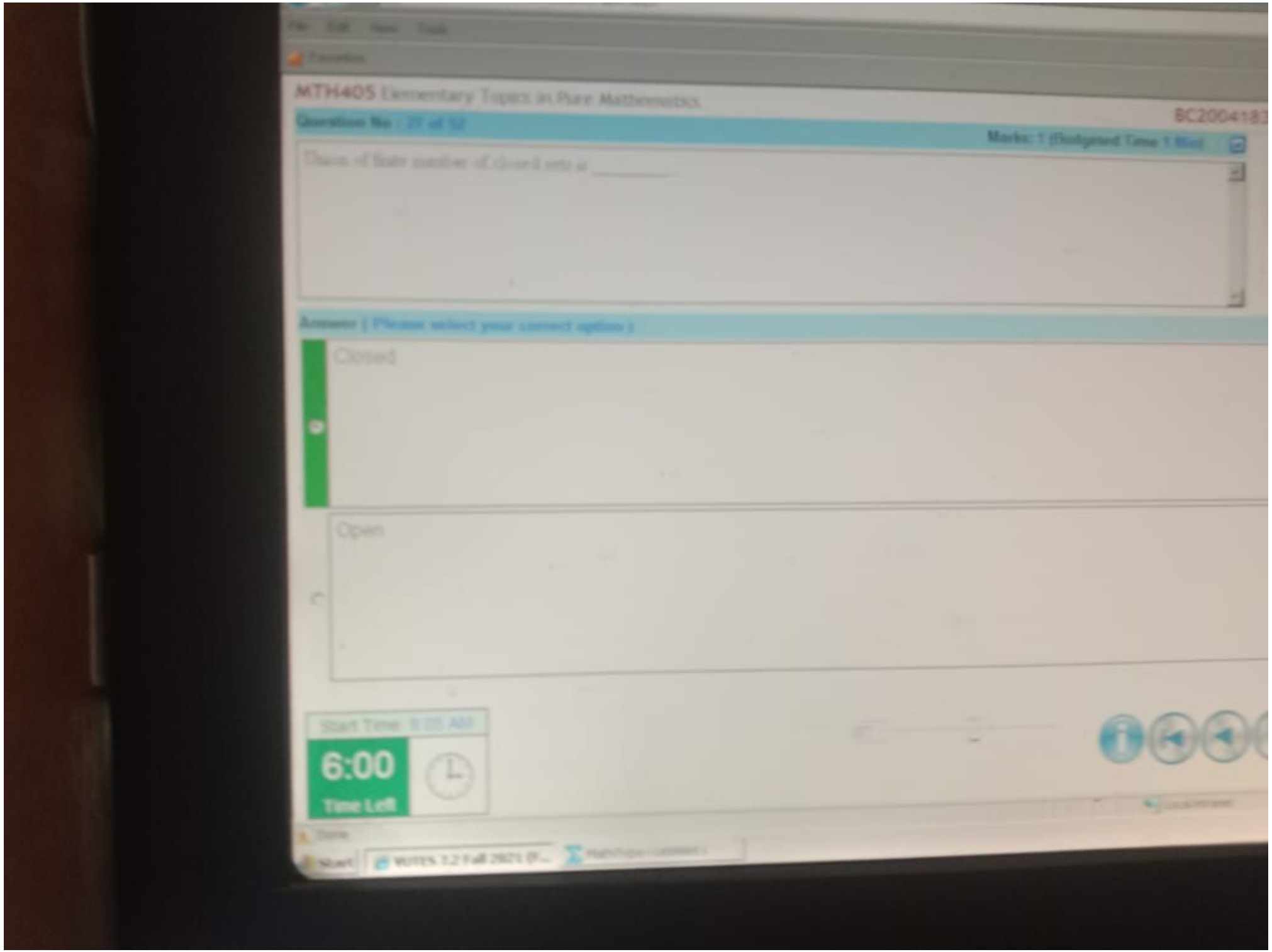
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Question No : 26 of 52

BC

Marks: 1 (Budgeted Time 1 Min

Euclidean metric on R is defined by .....

Answer (Please select your correct option)

- $d(x,y)=|x-y|$
- $d(x,y)=|x|-|y|$
- $d(x,y)=|x|+|y|$
- $d(x,y)=\sqrt{|x-y|}$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 28 of 52

BC200418371 (MUNAWA

Marks: 1 (Budgeted Time 1 Min)

The sequence $((-1)^n)^\infty$ is _____

Answer (Please select your correct option)

- Bounded
- Unbounded
- Convergent
- None of these

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MTH405 Elementary Topics in Pure Mathematics

Question No : 29 of 52

BC200418371 (MUNAWAR ALI)

Marks: 1 (Budgeted Time 1 Min)

Limit of sequence $\{(-1)^n\}^\infty$ is not unique.

Answer (Please select your correct option)

- (•) True
- ( ) False

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Question No : 30 of 52

BC200418371 (MUNAWAR

Marks: 1 (Budgeted Time 1 Min)

Symmetric property states that for all real numbers x and y .

Answer (Please select your correct option)

- $d(x,y) = d(y,x)$
- $d(x,y) \leq d(y,x)$
- $d(x,y) \geq d(y,x)$
- $d(x,y) = 0$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 31 of 52

BC200418371 (MUNAWAR

Marks: 1 (Budgeted Time 1 Min)

$]0,1[$ in $\mathbb{R}$ under usual metric space is an example of -------

Answer (Please select your correct option)

- open sphere
- open set
- open interval
- all choices are equivalent

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MTH405 Elementary Topics in Pure Mathematics

Question No : 32 of 52

BC200418371 (MUNAWAR ALI)

Marks: 1 (Budgeted Time 1 Min)

In a metric space $(\square, d)$, for the set of rationals, the closure -----

Answer (Please select your correct option)

- $\square$
- $\square$
- $\square$
- $\square$

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Question No : 33 of 50

Answer [Please select your correct option]

- $\lambda \subset A$
- $\lambda \subset A'$
- $A \subset A'$
- $A \subset \lambda$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 34 of 52

BC200418371 (MUNAWA

Marks: 1 (Budgeted Time 1 Min)

In the usual metric on Reals, the closure of Irrationals $\mathbb{Q}' = \ldots$

Answer (Please select your correct option)

- $\mathbb{R}$
- $\mathbb{Q}$
- $\mathbb{Q}'$
- $\mathbb{Z}$

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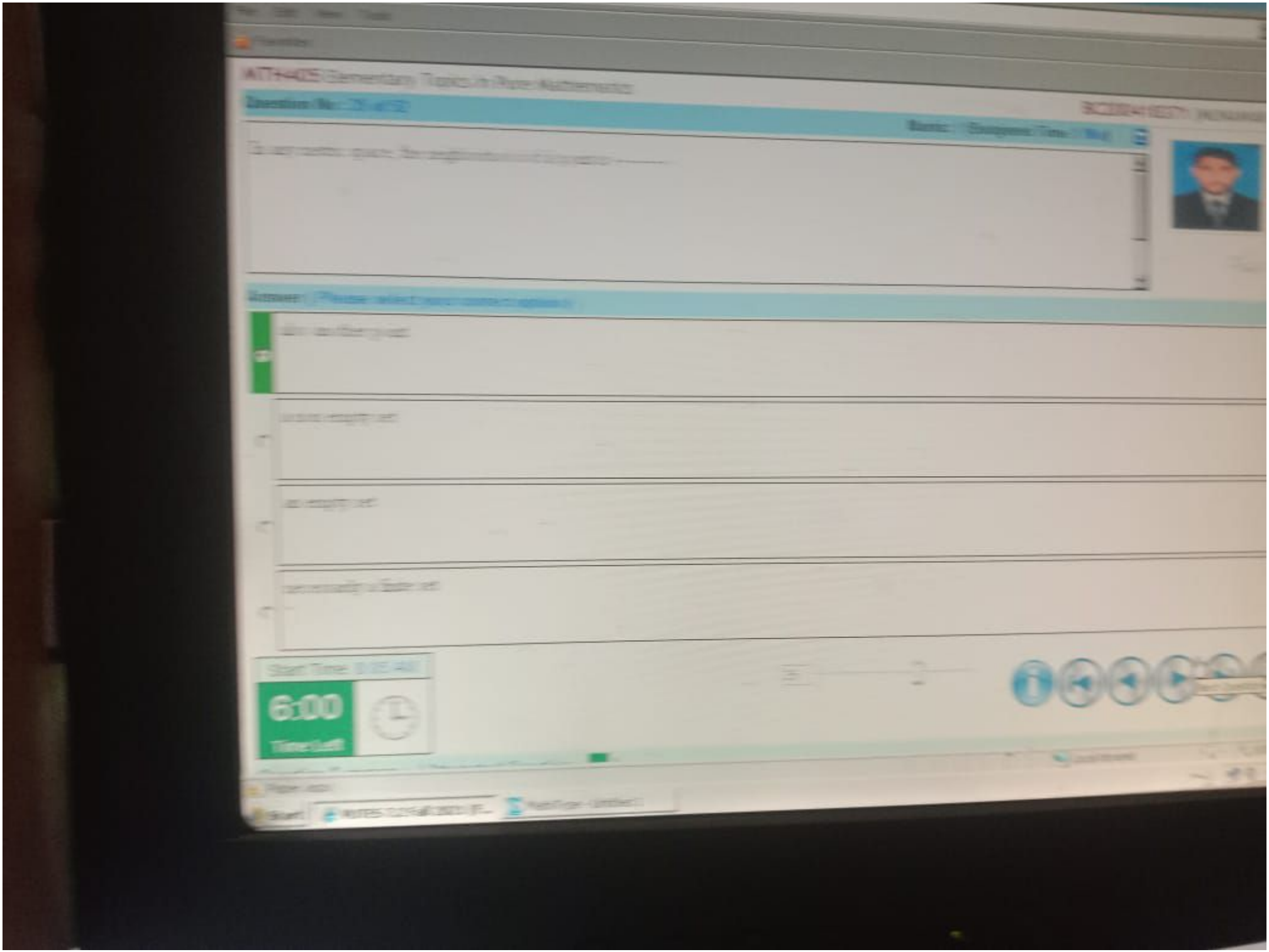
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MTH405 Elementary Topics in Pure Mathematics

Question No : 36 of 52

BC200418371 (MUNAWAR ALI)

Marks: 1 (Budgeted Time 1 Min)

Union of open intervals is ----- an open interval

Answer (Please select your correct option)

- necessarily
- not necessarily

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MTH405 Elementary Topics in Pure Mathematics

Question No : 37 of 52

Which of the following is an example of bounded function on Real line R?

Answer (Please select your correct option)

a. $\sin x$

b. e^x

c. $\ln_{Eu} x$

d. x^2

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MTH4405 Elementary Topics in Pure Mathematics

Question No : 38 of 52

Marks: 1 (Budgeted Time 1 Min)

For the distance function $d(x,y)=\left|\frac{1}{x}-\frac{1}{y}\right|$ in $(\mathbb{R}-\{0\},d)$, $d\left(\frac{1}{2},1\right)=$ ------

Answer (Please select your correct option)

- a) $\frac{1}{2}$
- b) 2
- c) 1
- d) $\frac{-1}{2}$

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Question No : 40 of 52

Marks: 1 (Budgeted Time 1 M

If $x_1, x_2, \cdots, x_n, y_1, y_2, \cdots, y_n \in \mathbb{R}$, then which of the following is Cauchy-Schwarz' inequality?

Answer (Please select your correct option)

- $(x_1y_1 + x_2y_2 + \cdots + x_ny_n)^2 \leq (x_1^2 + x_2^2 + \cdots + x_n^2)(y_1^2 + y_2^2 + \cdots + y_n^2)$
- $\sqrt{(x_1 + y_1)^2 + (x_2 + y_2)^2 + \cdots + (x_n + y_n)^2} \leq \sqrt{x_1^2 + x_2^2 + \cdots + x_n^2} + \sqrt{y_1^2 + y_2^2 + \cdots + y_n^2}$

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MTH405 Elementary Topics in Pure Mathematics

BC200418371

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

If $x_1, x_2, \cdots, x_n, y_1, y_2, \cdots, y_n \in \mathbb{R}$, then which of the following is Minkoski's inequality?

Answer (Please select your correct option)

- $(x_1y_1 + x_2y_2 + \cdots + x_ny_n)^2 \leq (x_1^2 + x_2^2 + \cdots + x_n^2)(y_1^2 + y_2^2 + \cdots + y_n^2)$
- $\sqrt{(x_1 + y_1)^2 + (x_2 + y_2)^2 + \cdots + (x_n + y_n)^2} \leq \sqrt{x_1^2 + x_2^2 + \cdots + x_n^2} + \sqrt{y_1^2 + y_2^2 + \cdots + y_n^2}$

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MTH403 Elementary Topics in Pure Mathematics

Question No : 41 of 52

Marks: 2 (Budgeted Time

Prove the *symmetry axiom* for $(\mathbb{R},d)$ defined by: $d(x,y)=|x-y|\ \forall x,y\in\mathbb{R}$

Answer (Please click here to Edit Answer)

Prove the *symmetry axiom* for $(\mathbb{R},d)$ defined by: $d(x,y)=|x-y|\ \forall x,y\in\mathbb{R}$

SOL

$d(x,y)=|x-y|=$ *we know, that*,

$d(x,y)=d(y,x)$

$d(x,y)=|-(y-x)|=d(x,y)=d(y,x)$

$d(x,y)=d(y,x)$

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MTH405 Elementary Topics in Pure Mathematics

BC200418371

Question No : 42 of 52

Marks: 2 (Budgeted Time 4 Min)

Find the Interior of any singleton set $\{0\}$ in usual metric space $(\mathbf{R}, d)$.

Answer (Please click here to Edit Answer)

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Find the Interior of any singleton set $\{0\}$ in usual metric space $(\mathbf{R}, d)$..

ans:

$d(x,y) = |x-y| = we\ know, that,$

$d(x,y) = d(y,x)$

$d(x,y) = |-(y-x)| = d(x,y) = d(y,x)$

$d(x,y) = d(y,x)$

$d(x,y) = d(y,x) = 0$

$p_1 = p(x-y), p_2 = p_o = (0,0)$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 45 of 52 BC200418371

Marks: 3 (Budgeted Time 6 Min)

Prove the symmetric axiom for the metric (R^n, d) defined by $d(x,y) = \sum_{i=1}^{n} |x_i - y_i|$.

Answer (Please click here to Edit Answer)

Prove the symmetric axiom for the metric (R^n, d) defined by $d(x,y) = \sum_{i=1}^{n} |x_i - y_i|$

sol:

$d(x,y) = d(y,x)$

$\sum_{i=1}^{n} |x_i - y_i| = show, that = d(x,y) = d(y,x)$

$= \sum_{i=1}^{n} |x_i - y_i| = \sum_{i=1}^{n} |-(y_i - x_i)| = \sum_{i=1}^{n} |(y_i - x_i)|$

$proved. that = d(x,y) = d(y,x) = \sum^{n} |(y_i - x_i)|$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 47 of 52

BC200418371 (MUNAWA

Marks: 3 (Budgeted Time 6 Min)

Give the expression and geometry (only description needed) of open sphere $S_1(0,0)$ in $\mathbb{R}^2$, under the metric $d : \mathbb{R}^2 \times \mathbb{R}^2 \to \mathbb{R}$ defined as $d(P_1,P_2) = \max\{|x_1 - x_2|, |y_1 - y_2|\}, \forall P_1(x_1,y_1), P_2(x_2,y_2) \in \mathbb{R}^2$

Answer (Please click here to Edit Answer)

100%

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Give the expression and geometry (only description needed) of open sphere $S_1(0,0)$ in $\mathbb{R}^2$, under the metric $d : \mathbb{R}^2 \times \mathbb{R}^2 \to \mathbb{R}$ defined as

$d(P_1,P_2) = \max\{|x_1 - x_2|, |y_1 - y_2|\}, \forall P_1(x_1,y_1), P_2(x_2,y_2) \in \mathbb{R}^2$

sol:

$d(P_1,P_2) = \max\{|x_1 - x_2|, |y_1 - y_2|\}, \forall P_1(x_1,y_1), P_2(x_2,y_2) \in \mathbb{R}^2$

$\{|x_1 - x_2|, |y_1 - y_2|\} \geq 0$

$d(x,y) \geq 0$

$x_1 = |x_1 - x_2| > 0$

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MTH405 Elementary Topics in Pure Mathematics

BC200418

Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

Give an example by showing that a bounded sequence may not be convergent

Answer (Please click here to Edit Answer)

Give an example by showing that a bounded sequence may not be convergent

ans:

$$= \sqrt{\sum_{j=1}^{n} a_j^2} + \sqrt{\sum_{j=1}^{n} b_j^2}$$

$$\sum_{n=1}^{\infty} \cap^{n} \cup^{n} = \text{bounded sequence}$$

$$(-\infty, +\infty) = \frac{1}{n_a}, \frac{1}{n_a} \ldots\ldots +$$

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MTH405 Elementary Topics in Pure Mathematics

BC200418371 (M

Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

Define the axioms satisfied by a metric d on a set X

Answer (Please click here to Edit Answer)

Define the axioms satisfied by a metric d on a set X

ans

sol

in mathimatical or logic an axiom is an unprovable rule or first principle accepted as true because it is selfevident or particulary u

$\{|x_1 - x_2|, |y_1 - y_2|\} \geq 0$

$d(x,y) \geq 0$

$p_1 = |x_1 - x_2| \geq 0$

$p_2 = |y_1 - y_2| \geq 0$

$non-nagavity \leftrightarrow (1)$

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MTH405 Elementary Topics in Pure Mathematics

BC200418371 (MUNA

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

Prove or disprove the non-negativity property for distance function defined by: $d^*(x,y)=k|x-y|, \quad x,y,k\in\mathbb{R}$

Answer (Please click here to Edit Answer)

100%

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Prove or disprove the non-negativity property for distance function defined by: $d^*(x,y)=k|x-y|, \quad x,y,k\in\mathbb{R}$

sol:

non-negativity property :

$d(x,y)\geq 0$

$d(x,y)\geq 0=k|x-y|\geq 0$

$k=\geq 0$

$[x,y]\geq 0$

$x\geq 0$

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MTH405 Elementary Topics in Pure Mathematics

Question No : 51 of 52

BC200418371 (MUNAW

Marks: 5 (Budgeted Time 10 Min)

Show that the open interval $]-1,1[\subset (\mathbb{R},d)$ is an open set.

Answer (Please click here to Edit Answer)

100%

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Show that the open interval $]-1,1[\subset (\mathbb{R},d)$ is an open set.

SOL:

$]-1,1[\subset (R,d)\, IS, OPEN, set$

$if =]-1,1[= p = (-1,1) =$

$p_o = (1-1) \subset R^2 =]-1,1[= 0$

$d(x,y) = (-1,1) = 0$

$d(x,y) = (-1,1) \geq 0$

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MTH405 Elementary Topics In Pure Mathematics

BC200418371 (MUHA

Question No : 50 of 52

Marks: 5 (Budgeted Time: 10 Min)

In a metric space (X,d), if a non empty subset A is closed, then show that its compliment is open.

Answer (Please click here to Edit Answer)

100%

Sol:

non-negativity property

$d(x,y) \geq 0$

$d(x,y) \geq 0 = k|x-y| \geq 0$

$k = \geq 0$

$[x,y] \geq 0$

$x \geq 0$

$y \geq 0$

disprove the non-negativity property

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MTH405 Elementary Topics in Pure Mathematics

BC200418371 (M

Question No : 52 of 52

Marks: 5 (Budgeted Time 10 Min)

If the distance function is defined by $d(x,y)=\left|\frac{1}{x}-\frac{1}{y}\right|$, $\forall x,y\in\mathbb{R}-\{0\}$, then solve the equation $d(x,2x)=1$

Answer (Please click here to Edit Answer)

100%

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f the distance function is defined by $d(x,y)=\left|\frac{1}{x}-\frac{1}{y}\right|$, $\forall x,y\in\mathbb{R}-\{0\}$, then solve the equation $d(x,2x)=1$

SOl:

$\left|\frac{1}{x}-\frac{1}{y}\right|=\forall x,y\in R-\{0\}$

$equation:(x,2x)=1$

$\left|\frac{1}{x}-\frac{1}{y}\right|$

$|1\ 1|$

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Done

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