Chhatrapati Shahu Ji Maharaj
University, Kanpur

Answer Script Details
Barcode 10427673

Roll No. 23071002365
Total Mark 70/75.00

Exam BACHELOR OF COMPUTER APPLICATIONS_ODD EXA
Subject BCA3005 - ELEMENTS OF STATISTICS

Question wise Mark Summary

Q.No	Mark	Q.No	Mark	Q.No	Mark	Q.No	Mark
1A	4/5	8	NA/15				
1B	5/5	9	14/15				
1C	4/5						
1D	5/5						
1E	5/5						
1F	5/5						
1G	4/5						
1H	5/5						
1I	4/5						
2	15/15						
3	NA/15						
4	NA/15						
5	NA/15						
6A	NA/7						
6B	NA/7						
7A	NA/7						
7B	NA/7						

Chhatrapati Shahu Ji Maharaj University
Kanpur, Uttar Pradesh

PART-I

Date of Exam: 06/01/25 Shift: Afternoon Room No. 60-13

Paper Code: BCA-3005 Subject: Elements of Statistics Year/Sem: III

Name of Candidate: Khyati Trivedi

Roll No. 2 3 0 7 1 0 0 2 3 6 5

Signature of Candidate: Khyati Trivedi

Signature of Invigilator

COE Facsimile

PART-II

MARKS OBTAINED

Q.	1	2	3	4	5	6	7	8	9	10
(a)										
(b)										
(c)										
(d)										
(e)										
(f)										
(g)										
(h)										
(i)										
(j)										
Total										

Total Marks in Figures — Max. Marks

Total Marks in Words

Paper Code

Signature of Evaluator

PART-III

Course: Bachelor of computer Application

Session: 2024-2025 Year/Semester: III rd Sem

Subject: Elements of Statistics.

Paper Code: B C A 3 0 0 5

Exam Date: 0 6 0 1 2 0 2 5

Name of Candidate: K H Y A T I T R I V E D I

Father's Name: S K T R I V E D I

महाविद्यालय का कोड College Code: K N 1 6 2

परीक्षा केन्द्र का कोड Exam Centre Code: K N 1 6 2

परीक्षा का प्रकार Type of Exam: संस्थागत Regular ● / भूतपूर्व छात्र Ex. Student ○ / व्यक्तिगत Private ○ / बैक पेपर परीक्षा Back paper Exam ○

ANSWER BOOKLET NO. **10427673**

Paper Code: B C A 3 0 0 5

PART-IV

नामांकन संख्या Enrollment Number: C S J M A 2 3 0 0 0 1 2 9 5 1 7

परीक्षार्थी अनुक्रमांक संख्या Candidate's Roll Number: 2 3 0 7 1 0 0 2 3 6 5

पेपर कोड Paper Code: 3 0 0 5

Signature of Candidate: Khyati Trivedi

Signature of Invigilator

C.S Facsimile

COE Facsimile

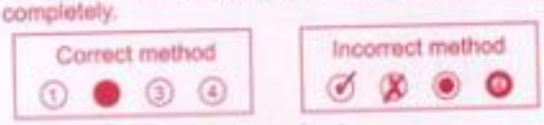
नोट : 1. परीक्षार्थी को निर्देशित किया जाता है कि आवरण पन्ने के पृष्ठ भाग पर अंकित सभी निर्देशों को सावधानी पूर्वक पढ़ें।
2. गोलक में भरी जाने वाली प्रविष्टियाँ बायीं तरफ से शुरू की जायें। 3. गोलों को काले या नीले बॉलपेन से भरा जाये।

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-I

1. Read the instructions carefully given on the answer script and admit card.
2. Write Date of Exam, Shift, Paper Code & Name of Subject Correctly.
3. Write Name & Roll No. Correctly.
4. Write Semester & Branch Correctly.

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-III

1. Use blue or black ball point pen for writing alphabets & numerals in ☐ Boxes.
2. Carefully study the example before you start marking.
3. As shown in the example below blacken the circles completely.



4. Make no Stray marks on this sheet.
5. **DO NOT WRITE OR MARK ON THE BAR CODE.**

IN ORDER TO AVOID UFM (UNFAIR MEANS) :

1. The Roll No. and Answer Book no. found elsewhere or any other symbol found in the answer book will be treated as unfair means.
2. Any tempering of Bar Code and Booklet no shall be treated as Unfair Means.
3. Do Not bring the materials like slip of paper/mobile/digital diaries/ study material/ revision notes in examination hall. Possession of the mobiles/ digital diaries/ electronic watch and any other electronic gadget except memory less scientific calculator shall be considered as UFM case.
4. Do not keep or paste currency note in answer script it shall be consider as UFM.

अनुचित साधन से बचने हेतु:

1. उत्तर पुस्तिका के निर्दैशित स्थान को छोड़कर अनुक्रमांक एवं उत्तरपुस्तिका का क्रमांक कहीं और न लिखें तथा कोई भी चिन्ह न बनायें क्योंकि यह अनुचित साधन प्रयोग की परिधि में आता है।
2. उत्तर पुस्तिका के बारकोड अथवा उत्तर पुस्तिका संख्या पर छेड़ करने पर अनुचित साधन प्रयोग माना जायेगा।
3. परीक्षा कक्ष में निम्न वस्तुएं साथ न लायें, जैसे लिखे हुए कागज के टुकड़े, मोबाईल, डिजिटल डायरी, कोपी, पुस्तक यह सभी वस्तुएं जो अनुचित साधन के अन्तर्गत आती है। केवल संबंधित प्रश्नपत्र में ही मेमोरी लैस साइंटफिक केल्कुलेटर ले जाने की अनुमन्यता होगी।
4. उत्तर पुस्तिकाओं में रूपये न रखें न ही उत्तर पुस्तिका में छिपायें। ऐसा करना अनुचित साधन प्रयोग की परिधि में आता है।

परीक्षार्थी के लिए निर्देश

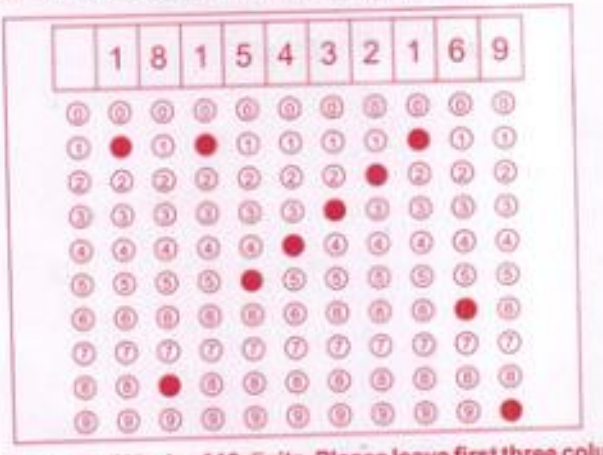
1. प्रवेश पत्र एवं उत्तर पुस्तिका पर दिये गये निर्देशों को ध्यान से पढ़ें।
2. कवर पृष्ठ के दूसरी तरफ कुछ न लिखें।
3. उत्तर पुस्तिका के पृष्ठों पर दोनों तरफ लिखें।
4. प्रश्न पत्र पर अपने अनुक्रमांक के अतिरिक्त कुछ न लिखें।
5. प्रश्न पत्र कोड एवं प्रश्न पत्र कोड सावधानी पूर्वक लिखें।
6. अपनी स्थिति स्पष्ट लिखें।
7. उत्तर पुस्तिका के पृष्ठों की संख्या देखें। अगर उत्तर पुस्तिका में पृष्ठ (1–24) से कम है या फटे हुए है, तो परीक्षा शुरू होने के पूर्व दूसरी उत्तर पुस्तिका ले लें।
8. प्रश्नपत्र को देख, यदि प्रश्नपत्र के विषय कोड, विषय का नाम तथा प्रश्न में कोई त्रुटि है तो उसके परीक्षा शुरू होने के 30 मिनट के अन्दर कक्ष निरीक्षक को तत्काल सूचित करें, उसके बाद विश्वविद्यालय द्वारा कोई कार्यवाही नहीं की जायेगी।
9. प्रश्नों के उत्तर लिखने के लिये पैंसिल का प्रयोग न करें।
10. B कोपी या अतिरिक्त ग्राफ नहीं दिया जायेगा।

INSTRUCTIONS TO THE CANDIDATE

1. Read the instructions carefully given on the Question Paper, Admit Card & Answer Script.
2. Do not write anything on back side of the cover page.
3. Write on both sides of pages of answer book.
4. Do not write anything on question paper except Roll Number.
5. Write Paper Code & Question Paper Id carefully.
6. CHECK the number of pages (1-32) or any other kind of damage in your answer script, if found than change the answer script immediately before the commencement of examination.
7. CHECK the Question Paper for any kind of discrepancy e.g. Subject Code, Subject Name and Question of the Question Paper during first THIRTY MINUTES of the commencement of the exam, so that it can be corrected in TIME. After that no corrections shall be entertained by the university.
8. Do not use pencil for answering the question.
9. Write status correctly e.g. those appearing in carry over papers should fill in status as Carry Over. Those appearing as Ex-Students should fill in status as ex.
10. No supplementary answer book & graph paper will be provided.

INSTRUCTIONS TO THE CANDIDATE FOR FILLING PART-IV

1. Use blue or black ball point pen for writing alphabets & numberals in ☐ Boxes.
2. Use blue or black ball point pen for filling the circles.



Note - If your Roll No. is of 10 digits. Please leave first three columr

Paper Code

01

Section-A.

A.

Distrust of Statistics

1. Distrust of statistics refers to the reasons due to which the reliability of the information provided by statistics is compromised.

There are following reasons for distrust of statistics-

1). Selective Presentation -

- Many times organizations or service providers do cherry picking & present only that data in their statistics which is economically or socially a ajenda for them.

2). Does not deal with Individual Data

- Statistics only deal with a collection of a interval of data and does not provide separate information about separate data.

Many time extreme fluctuations of data have a major importance but they are not shown in the statistics reports

3. Can be manipulated.

Statistics is a report that can be hindered or manipulated by the presenter for personal benefits and agenda

Due to this external users do not completely judge & belief their reports & distrust of Statistics arises

4. Quantitative not Qualitative.

Statistics ignore the Qualitative aspect of the data and present only the quantative or numerical aspect of data due to which Quality is compromised & Sometimes inefficient result arises from statistical reports.

5. Can be used for specific tasks. Statistics is a field that only deals with collecting, organizing & interpreting. We cannot use it to determine ~~Quality~~, services, type efficiency and many and many more such attributional things.

Paper Code

03

B.

Mid point - 25, 32, 39, 46, 53, 60

To find the size from the midpoints we need to perform-

Step-1 Calculate difference b/w two consecutive midpoints & divide by 2.

Step-2. Subtract the result from mid-point and then you will get lower limit

Step-3. Add the difference to mid-point to get upper limit

Difference = 32-25 = 7, 39-32=7.

Mid point	lower limit	Upper limit	class-interval
25	25-3.5=21.5	25+7=32	
32	32-7=		
39			
46			
53			
60			

Difference = 32-25=7

39-32=7

∴ 7/2 = 3.5

Mid point	lower limit	Upper limit	class-interval
25	25-3.5 = 21.5	25+3.5 = 28.5	21.5 - 28.5
32	32-3.5=28.5	32+3.5 = 35.5	28.5 - 35.5
39	39-3.5=35.5	39+3.5 = 42.5	35.5 - 42.5
46	46-3.5 = 42.5	46+3.5 = 49.5	42.5 - 49.5
53	53-3.5 = 49.5	53+3.5=56.5	49.5 - 56.5
60	60-3.5 = 56.5	60+3.5=63.5	56.5 - 63.5

Size of class interval = Upper limit - lower limit.

$= 28.5 - 21.5$

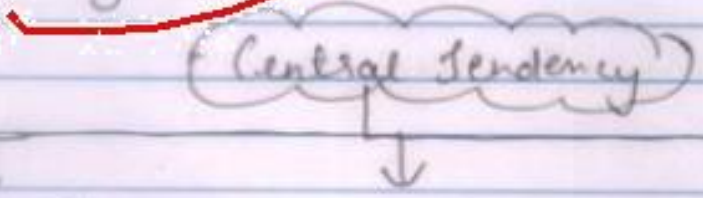
$\boxed{? = 7}$

C) Measures of central Tendency.

- Measures of central tendency are the tools which are used to calculate & monitor the ~~the~~ absolute central tendencies like mean median and mode.
- The data at the middle of a central Tendency graph is the central Tendency where mean = median = mode for normally distributed data.
- 

- All the means, median & modes have a deviation from the central tendency.
- They can have either positive deviation or a negative deviation

from the central tendency.

- However for calculation of deviation the sign of deviation is ignored only the extent of deviation is recorded.
- These deviations are later calculated using measures of dispersion.
- 

1. Mean- Mean is the average of the data set. Data can be any type - individual, continuous, class-interval.
   ex- 6, 7, 8 = 6+7+8/3 = 7
2. Median- Median is the mid value of the data set in an arrangement of ascending or descending order.
   ex- 1 2 (3) 4 5 Median = 3.
3. Mode- Mode is the highest frequency of the dataset's element.
   ex- 4, 9, 9, 9 = Mode = 9

d. Harmonic mean of 2, 5, 7, 9.

	1/n
2	0.50
5	0.20
7	0.14
9	0.11

$\Sigma \frac{1}{n} = 0.95$

$$\text{Harmonic Mean} = \frac{n}{\Sigma \frac{1}{n}}$$

$$= \frac{4}{\frac{1}{2}+\frac{1}{5}+\frac{1}{7}+\frac{1}{9}}$$

$$= \frac{4}{0.50+0.20+0.14+0.11}$$

$$= \frac{4}{0.95}$$

$$= 4.21$$

Harmonic Mean = 4.21

Q.

Marks obtained -

55, 49, 65, 63, 49, 92 and 79.

Range -

For calculation of Range. First lets arrange the data to get the highest and the lowest value.

Range = Upper limit - Lower limit → (i)

49, 49, 55, 63, 65, 79, 92

Range = 92 - 49.

Range = 43

Coefficient of Range = $\frac{\text{Upper limit} - \text{Lower limit}}{\text{Upper limit} + \text{Lower limit}}$.

$= \frac{92 - 49}{92 + 49}$.

$= \frac{43}{141}$

$= 0.30$

f. $0! = 1$

$n! = n \times n-1 \times n-2 \cdots 0$

$0! = 0 \times 0-1 \rightarrow < 0$

Since we can only calculate factorial of a +ve number

$0 \times \cdots \cdots -\infty$

$0 \times - - - - - -\infty$

undefined

$\therefore 0! = 1$

g. EXAMINATION

There are 11 letters present in the word EXAMINATION.

Therefore total 11! permutation can be formed.

but letters like I, A, N are repeated 2 times.

$\frac{11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{2 \cdot 2 \cdot 2}$

so the permutations having similar arrangement of I, I, A, A and N, N in different words will be considered 1

therefore we need to divide the following 11! by 2! for A
2! for I
2! for N.

∴ Total Permutations $= \frac{11!}{2! \cdot 2! \cdot 2!}$

$= \frac{11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2!}{2! \times 2! \times 2!}$

$= 9979200$

h- A bage contains 1-20 tickets.

Two tickets are drawn $^{20}C_2$.

P(both numbers are prime) = ?

First we will calculate the occurences of prime number combination of 2

(2,3) (3,2) (3,5) (3,7) (5,3) (7,3) (5,7)
(7,5) (7,11) (11,7) (11,2)

prime no- 2, 3, 5, 7, 11, 13, 17, 19.

we can have - 8 prime numbers
b/w 1-20

No. of ways of getting a combination of 2 prime number tickets $= {}^8C_2$

p(getting both prime number tickets) $= \frac{{}^8C_2}{{}^{20}C_2}$.

$\therefore \frac{18}{16 \times 21}$

$\frac{120}{118 \cdot 2!}$

$= \frac{8 \times 7 \times 6!}{2 \times 6!}$

$\frac{20 \times 19 \times 18!}{18! \times 2}$

$= \frac{28}{190} \quad \frac{28}{190}$ 0.14

p(getting both prime no.) = 0.147

i) Limitations of Statistical Quality Control.

1. Misinterpreted

- Statistical Quality control forms a report after monitoring the quality & production of a service but sometimes it can be misinterpreted because it also includes attributional charts that are not easy to understand.

2. Selective Presentation.

- Certain organisations for a particular agenda show false or picked information for their organizational welfare.
- This promotes distrust and compromises with the quality and quantity standards

3. Not easy to implement

- Statistical Quality control is not a frequent process which means that the time difference between the production and analysis takes time but till then a lot of resources are wasted.

4. (Wastage of Resources due to Delay)

- In statistical Quality Control until a verified report does not arrive process does not stop and if the quality standards are not met so all the resources are wasted which were used.

5. (Not for Individual Data)

- It deals with a bundle of data so it is not affected by extreme variations within data which on individual are not good for use but it doesn't reflect on the SQC reports.

Section-C.

3. locate Mode

Class	Frequency	f_1	f_2	f_3	f_4	f_5
0-5	5	12				
5-10	7		1	21		
10-15	9	27			34	
15-20	18		34			43
20-25	16	30		48	36	
25-30	14		20			23
30-35	6	9				
35-40	3					

First we will calculate the frequency table.

We need Frequency Table in order to get the ~~mean~~ & mode class.

	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40.
f					✓	✓		
ii				✓	✓			
iii				✓	✓	✓		
iv.					✓	✓	✓	
v).			✓	✓	✓			

The highest ticked class is - 20-25

∴ mode class is = 20-25

Now it is considered that the mode lies b/w the range of 20-25

$$\text{Mode} = L + \frac{f - f_1}{2f - f_1 - f_2} \times i$$

L = lower limit
f = frequency of mode class
f_1 = frequency above mode class
f_2 = frequency below mode class
i = class interval

$$= 20 + \frac{16 - 18}{2 \times 16 - 18 - 14} \times 5$$

$$= 20 + \frac{(-2)}{32 - 18 - 14} \times 5$$

Section-C

9).

Sample Numb.	$\bar{x}$	$\bar{R}$
1	43	5
2	49	6
3	37	5
4	44	7
5	45	7
6	37	4
7	51	8
8	46	6
9	43	4
10	45	6

control limits -

$CL = \bar{\bar{x}}$

$UCL = \bar{\bar{x}} + A_2 \bar{R}$

$LCL = \bar{\bar{x}} - A_2 \bar{R}$

for $\bar{\bar{x}} = \frac{\Sigma \bar{x}}{\text{no. of } \bar{x} \text{ (sample)}}$

$= \frac{43+49+37+44+45+37+51+46+43+45}{10}$

$= \frac{440}{10}$

$\bar{\bar{x}} = 44$

$\bar{R} = \frac{\Sigma R}{\text{no of samples}}$

$= \frac{5+6+5+7+7+4+8+6+4+6}{10}$

$= \frac{58}{10}$

$\boxed{\bar{R} = 5.8}$

$CL = \bar{\bar{x}}$

$\boxed{CL = 44}$

Upper control Limit $= \bar{\bar{x}} + A_2 \bar{R}$ $\quad A_2 = 0.483$

$= 44 + 0.483 \times 5.8$

$= 44 + 2.80$

$\boxed{UCL = 46.80}$

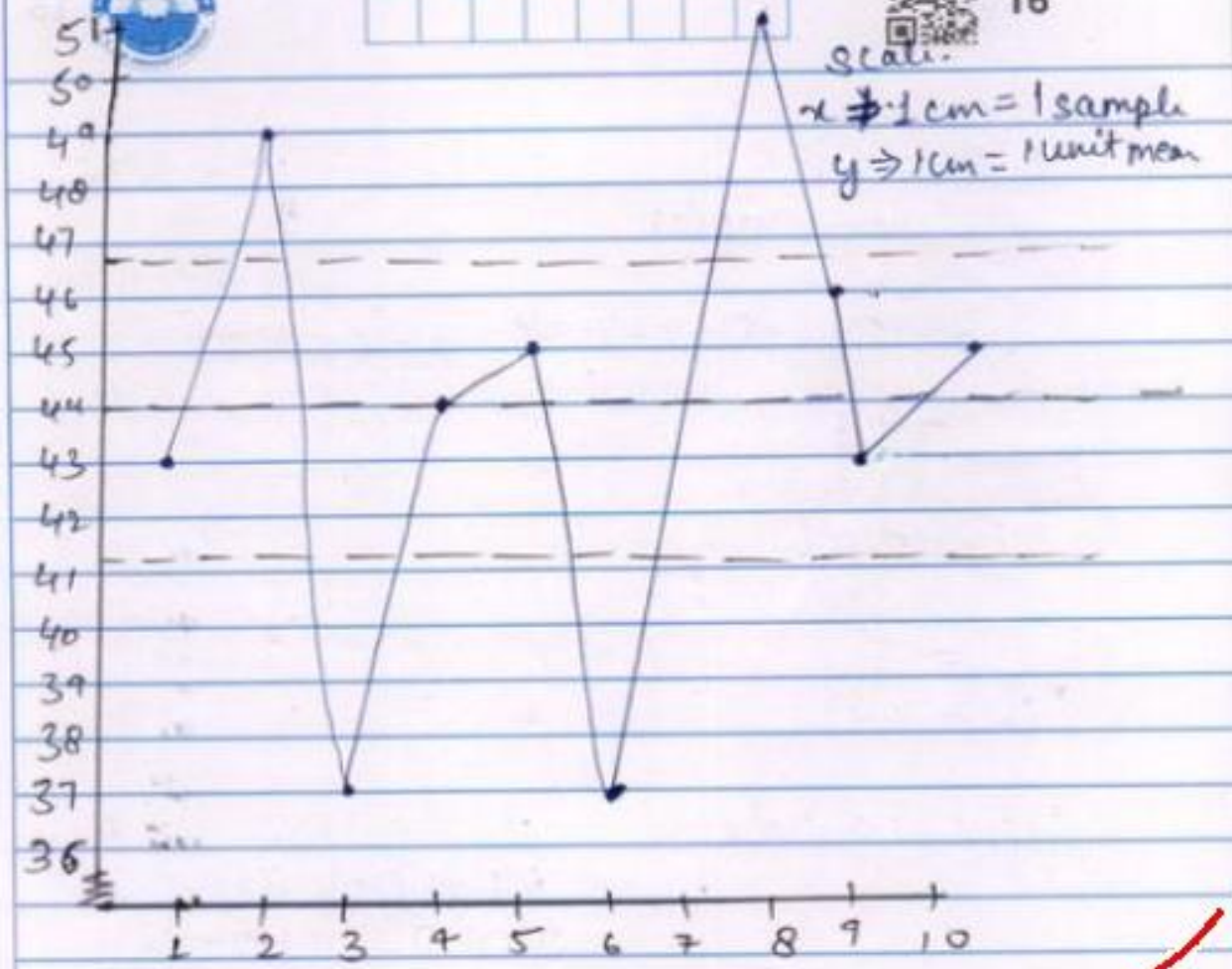
Lower control limit $= \bar{\bar{x}} - A_2 \bar{R}$

$= 44 - 0.483 \times 5.8$

$= 44 - 2.80$

$\boxed{LCL = 41.2}$

Mean chart on next p.g. →



Since certain mean value exceed the Upper control limit and lower control limit.

Process is not in control.

the values like 49, 51 are greater than the upper control limit.

The values like 37 are less than lower control limit

Therefore the Process is not in control.

Section-B

Q-2)

Weight	frequency
30-34	3
35-39	5
40-44	12
45-49	28
50-54	14
55-59	6
60-64	2

First we calculate less than frequency table.

Weight	Less than	
29.5-34.5	Less than 34.5	3
34.5-39.5	Less than 39.5	8
39.5-44.5	Less than 44.5	20
44.5-49.5	Less than 49.5	48
49.5-54.5	Less than 54.5	62
54.5-59.5	Less than 59.5	68
59.5-64.5	Less than 64.5	70

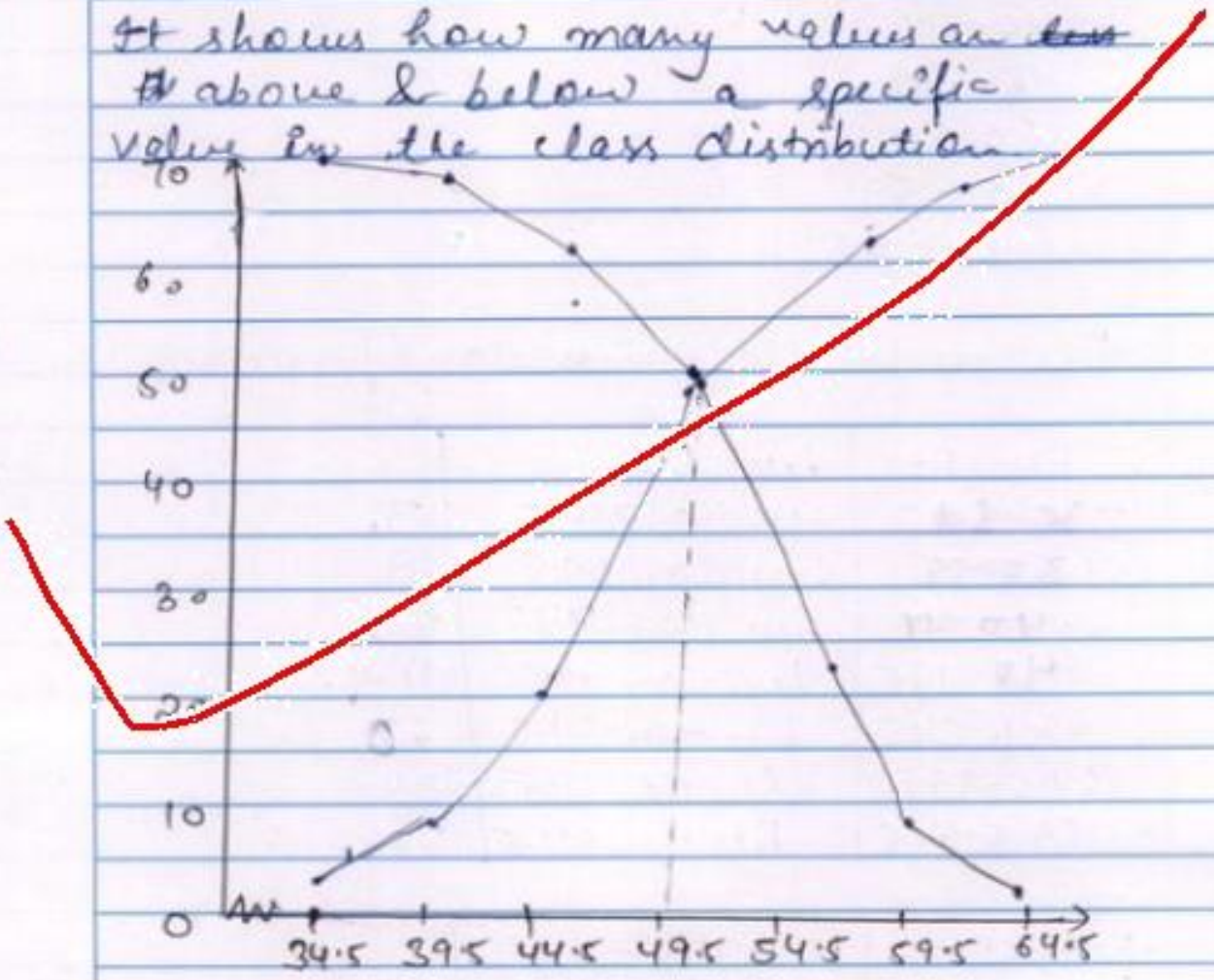
Weight	More than	
29.5-34.5	More than 29.5	70
34.5-39.5	More than 34.5	67
39.5-44.5	More than 39.5	62
44.5-49.5	More than 44.5	50
49.5-54.5	More than 49.5	22
54.5-59.5	More than 54.5	8
59.5-64.5	More than 59.5	2

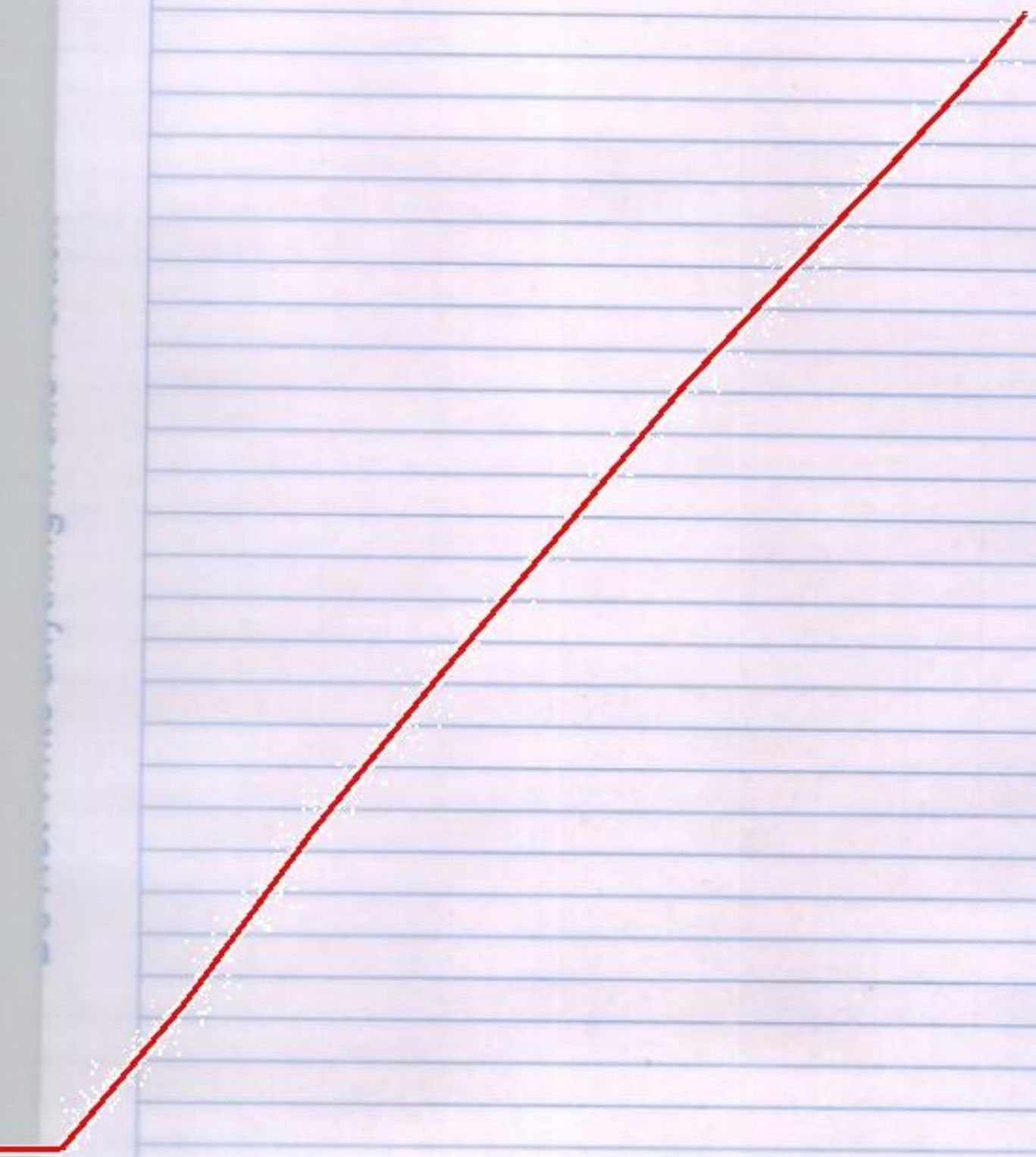
Paper Code

Ojive.

It is the graphical representation of the less than and more than frequency table.

It shows how many values are above & below a specific value in the class distribution.

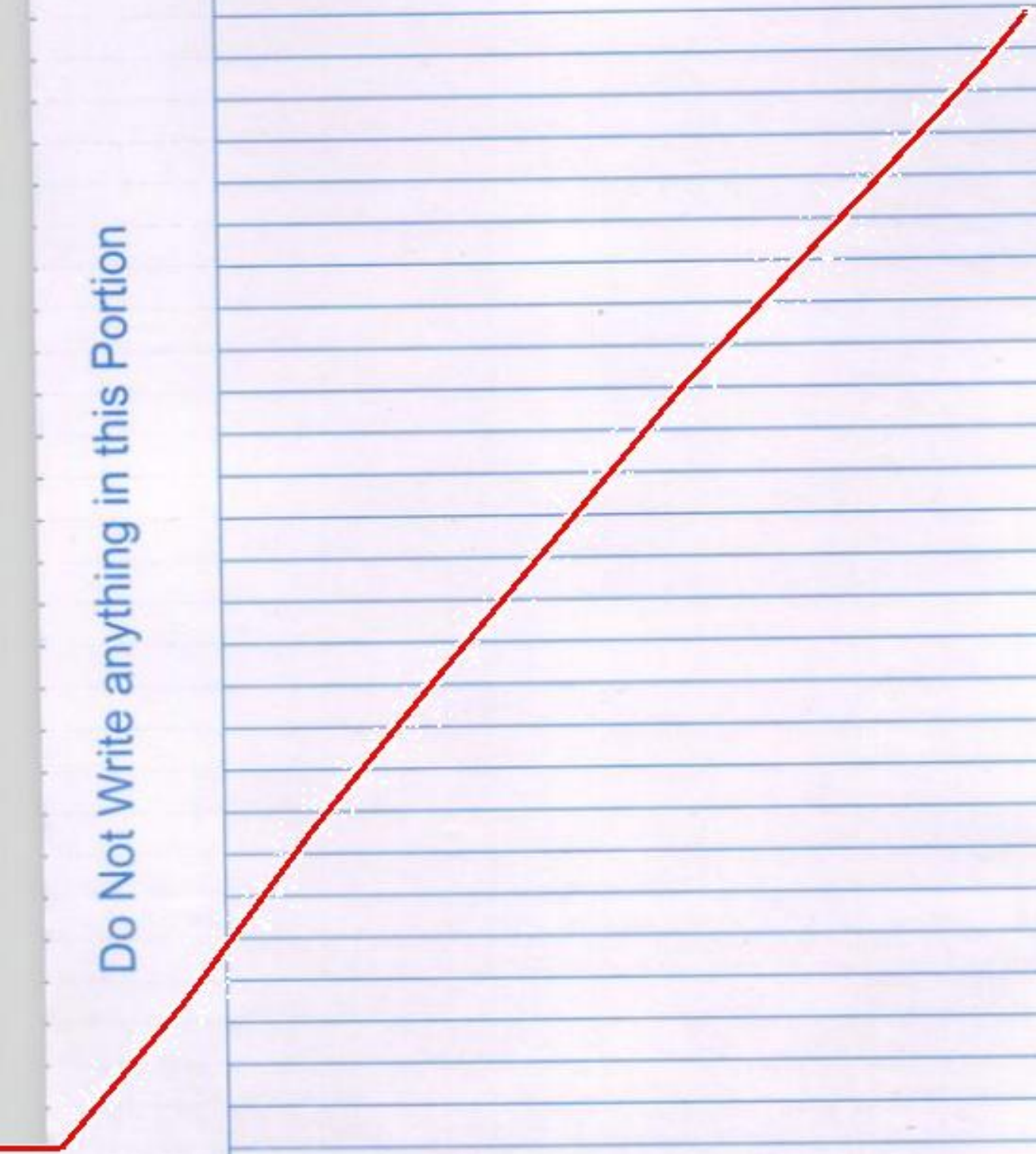


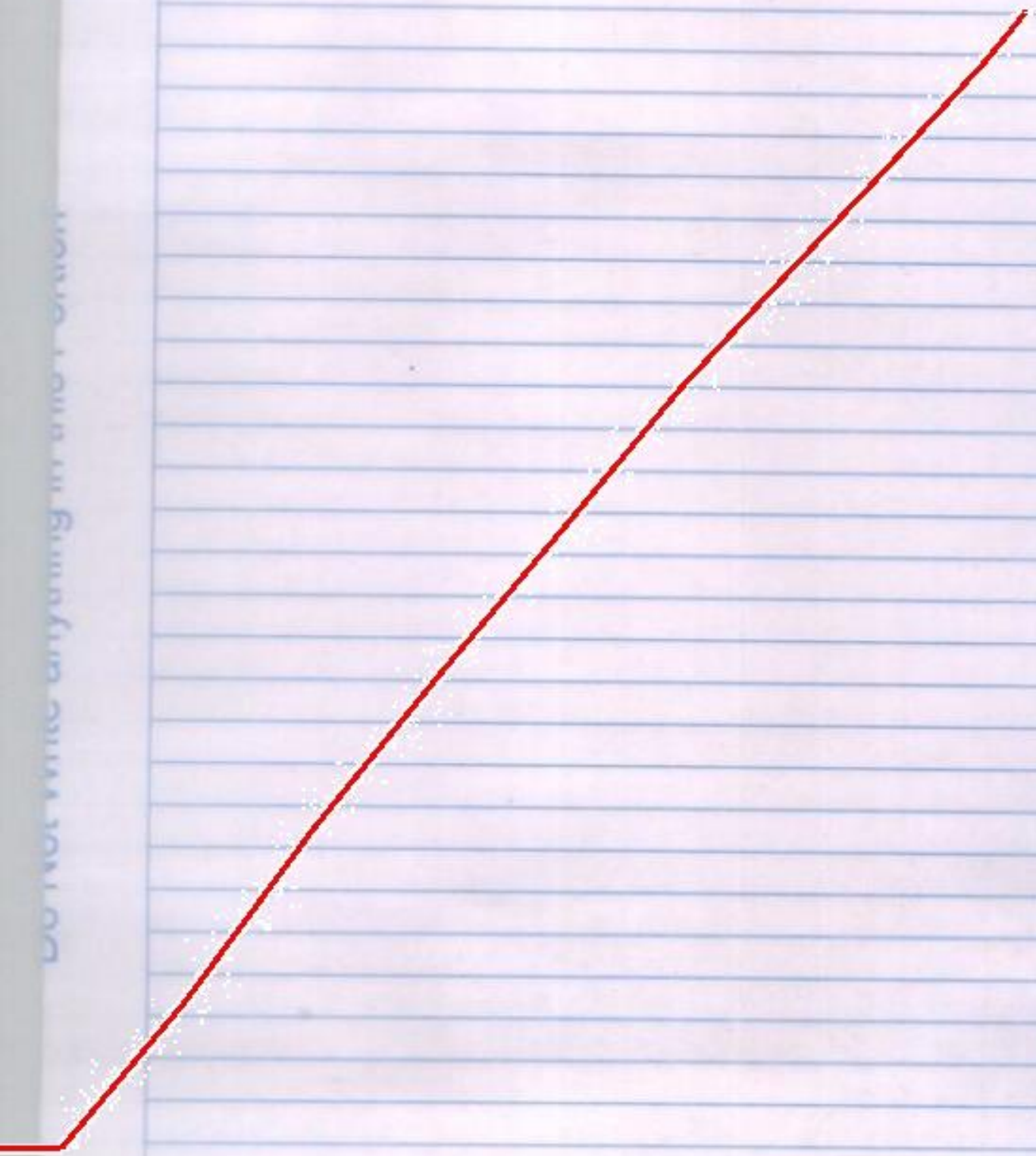


Paper Code

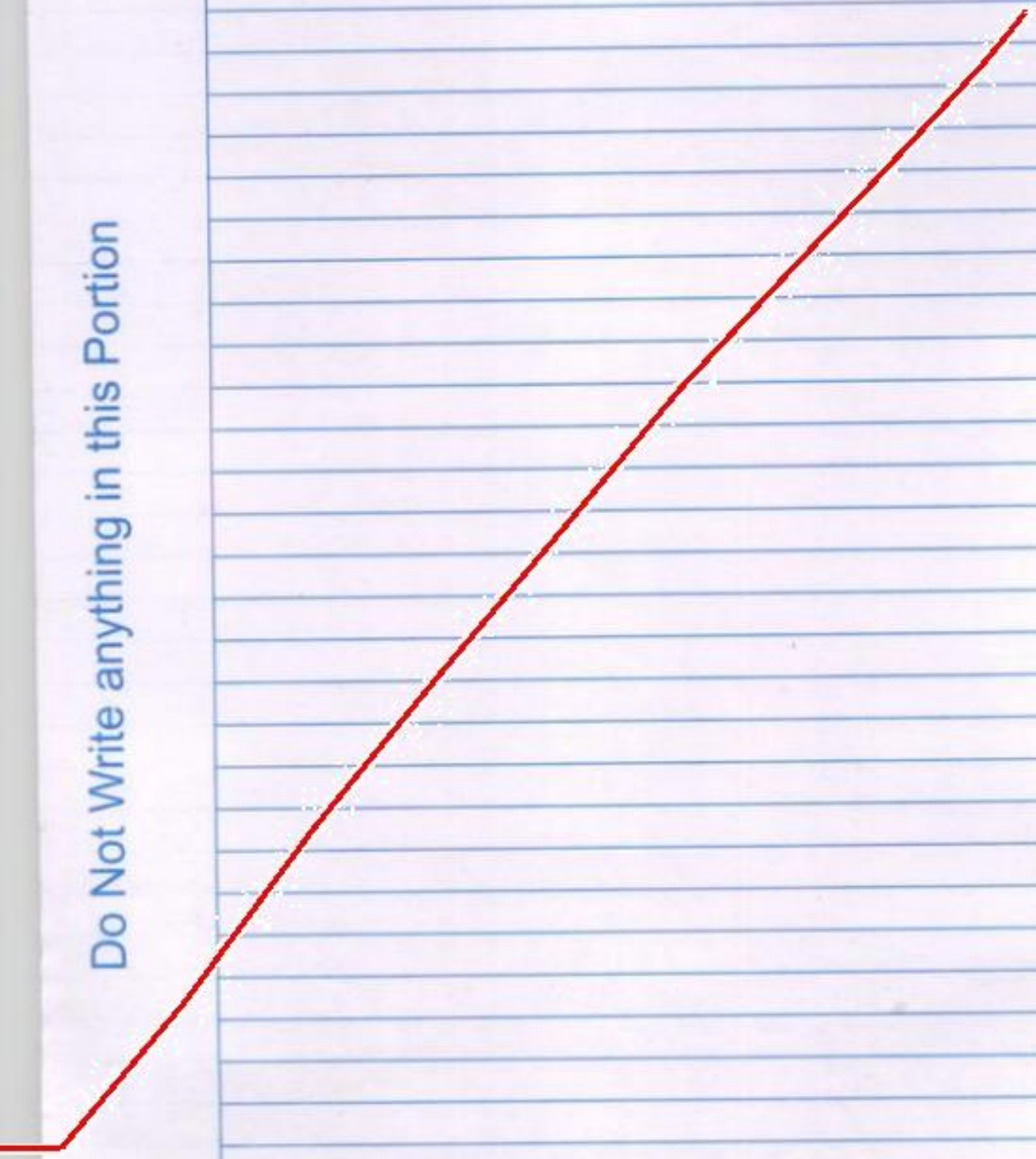
20

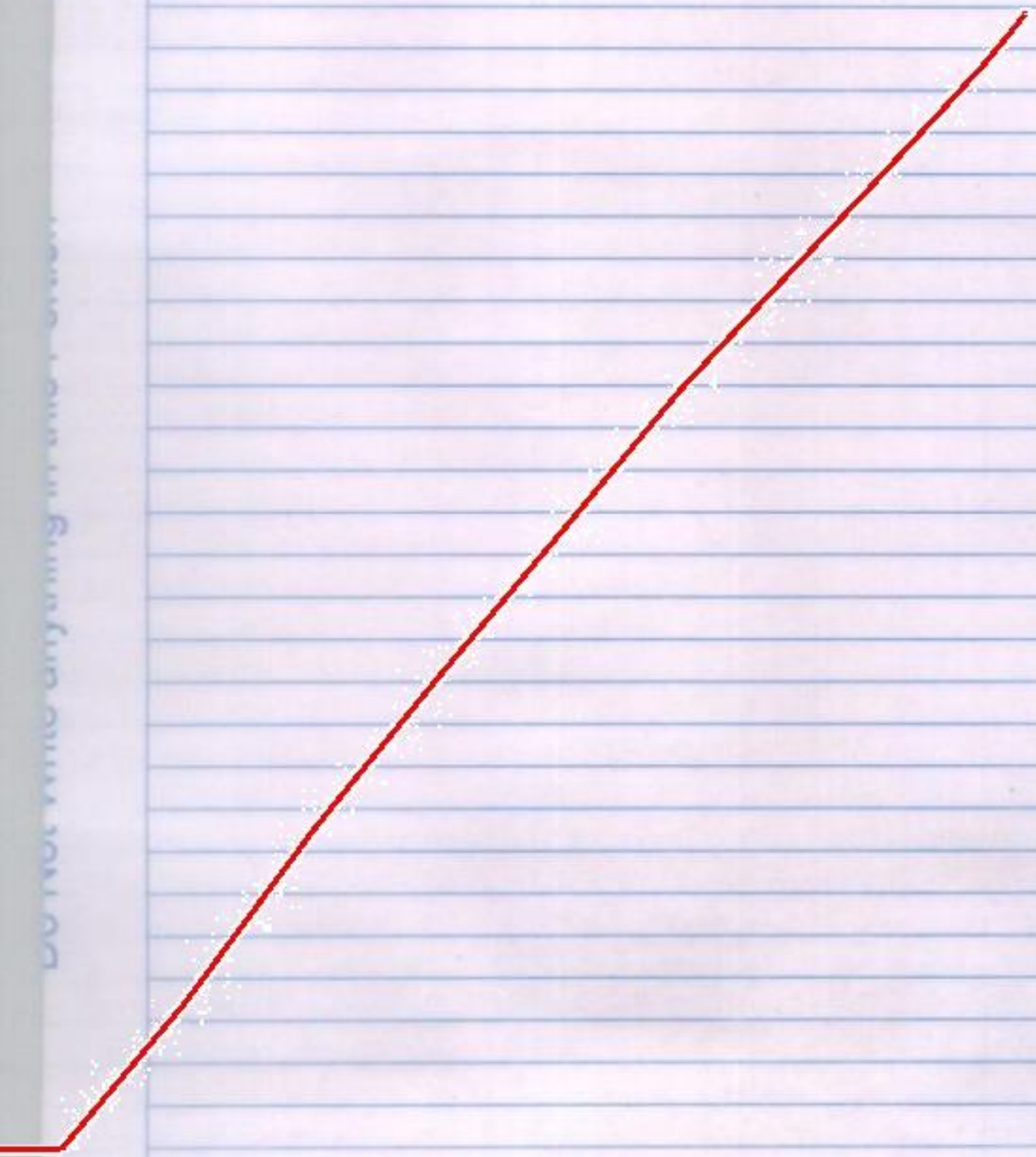
Do Not Write anything in this Portion





Do Not Write anything in this Portion





Paper Code

24

Do Not Write anything in this Portion