Chhatrapati Shahu Ji Maharaj
University, Kanpur

Answer Script Details
Barcode 7898265

Roll No. 22031000195
Total Mark 30/50.00

Exam B.SC IN AGRICULTURE BSCAG_ODD-EXAM-DEC-24
Subject AG5002 - CROP IMPROVEMENT-I KHARIF CROPS NE

Question wise Mark Summary

Q.No	Mark	Q.No	Mark	Q.No	Mark	Q.No	Mark
1A	3/5						
1B	3/5						
1C	3/5						
1D	2/5						
1E	2/5						
1F	3/5						
2	NA/10						
3	7/10						
4	NA/10						
5	NA/10						
6	NA/10						
7	NA/10						
8	7/10						
9	NA/10						

Chhatrapati Shahu Ji Maharaj University
Kanpur, Uttar Pradesh

PART-I

Date of Exam: 29/1/2025 Shift: III rd Room No.: 55

Paper Code: AG-5002 Subject: Crop Improvement-I Year: 5th

Name of Candidate: KUMAR VAIBHAV

Roll No.: 2 2 0 3 1 0 0 0 1 9 5

Signature of Candidate

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										

AG 5002

Paper Code

Signature of Evaluator

PART-III

Course: B. Sc. (Ag.)

Session: 2024-25 Year/ Semester: 5th

Subject Name: Crop Improvement-I

Medium: English ○ Hindi ●

Paper Code: AG 5002

Exam Date: 29/01/2025

Name of Candidate: KUMAR VAIBHAV

Father's Name: VINOD KUMAR VERMA

महाविद्यालय का कोड College Code: A U 0 2

परीक्षा केन्द्र का कोड Exam Centre Code: A U 0 2

परीक्षा का प्रकार Type of Exam: Regular ● Ex-Student ○ Private ○ Back Paper Exam ○

ANSWER BOOKLET NO.: 7898265

AG 5002

Paper Code

PART-IV

Enrollment Number: C S J M A 2 2 0 0 0 0 4 0 7 1 2

Candidate's Roll Number: 2 2 0 3 1 0 0 0 1 9 5

Paper Code: AG 5002

Signature of Candidate

Signature of Invigilator

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नोट:- 1. परीक्षार्थी को निर्देशित किया जाता है कि आवंटन पत्रे के पृष्ठ भाग पर अंकित सभी निर्देशों को सावधानी पूर्वक पढ़ें।
2. परीक्षा में आने वाले सभी प्रतिनिधियों सभी सादा के सूचना करें। 3. गलती को काटने या गलत करने से बचा जायें।

INSTRUCTION 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.

INSTRUCTION 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.

Correct Method: (1) ● (3) (4)

Incorrect Method: ✓ ✗ ◉ ⓪

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

IN ORDER TO AVOD 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/digital/ 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 निर्देशित स्थान को छोड़कर अनुक्रमांक एवं उत्तरपुस्तिका का क्रमांक कहीं और न लिखे 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 ऊँच छाड़ करने पर अनुचित साधन प्रयोग माना जायेगा।
3. परीक्षा कक्ष में निम्न वस्तुएं साथ न लायें, जैसे लिखे हुए कागज के टुकड़ें, मोबाईल, डिजिटल डायरी, डिजिटल वॉच, कॉपी, पुस्तक यह सभी वस्तुएं जो अनुचित साधन के अन्तर्गत आती है। केवल संशोधित प्रश्नपत्र में ही मेमोरी लेस साइंटफिक कैलकुलेटर ले जाने की अनुमन्यता होगी।
4. उत्तर पुस्तिकाओं में रुपये न रखे न ही उत्तर पुस्तिका में चिपकायें। ऐसा करना अनुचित साधन प्रयोग की परिधि में आता है।

परीक्षार्थियों को विशेष 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 ID 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 कटे 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 प्रारंभ होने के 30 मिनट के अन्दर कक्ष निरीक्षक को लिखित सूचित करें, उसके बाद विश्वविद्यालय द्वारा कोई बात नहीं की जायेगी।
9. प्रश्नों के उत्तर लिखने के लिये पेंसिल का प्रयोग न करें।
10. दी गयी या अतिरिक्त शीट नहीं दिया जायेगा।

INSTRUCTION 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 (1-24) 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, Su Name, and Question of the Question Paper during first THIRTY MINUTES of t 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 stat as Carry Over. Those appearing as Ex- Students should fill in status as ex.
10. No supplementary answer book & graph paper will be provided.

INSTRUCTION TO THE CANDIDATE FOR FILLING PART-IV

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

	1	8	1	5	4	3	2	1	6	9
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1	●	1	●	1	1	1	1	●	1	1
2	2	2	2	2	2	2	●	2	2	2
3	3	3	3	3	3	●	3	3	3	3
4	4	4	4	4	●	4	4	4	4	4
5	5	5	5	●	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	●	6
7	7	7	7	7	7	7	7	7	7	7
8	8	●	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	●

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

Paper Code
PGS02

1

-: Section-A :-

-: Ans-2 :-

-: Ans-2(A) :-

Semi-Dwarfism :-

Semi-dwarfism refers to the reduction in plant hieght.

- In rice the semi-dwarfism is controlled by a single dominant gene d$_{1}$.
- The gene responsible for semi-dwarfism in rice is due to dee-geo-woo-gene (DGWG), is a self-spontaneous mutant.
- in wheat → [illegible]-10

Characteristics of a semi-dwarf Variety of Rice :-

i) Lodging resistance
ii) Photoperiod Insensitive
iii) Input responsive
iv) Early maturity in duration
v) Better harvesting Index
vi) Upright foliage (stiffy type leaves)

1st Semidwarf rice variety → TN-1 (Taichung Native-1)

2nd Semidwarf rice variety → IR-8, developed by IRRI (Philippiene).

* Deegee-woo-gen × Tsai-yuen-chung
↓
F_1 → TN-1

* (♀) Petta (tallgrowing) × Dwarf (♂)
↓
9R-8. #

✓

:- Ans-1 (2) :-

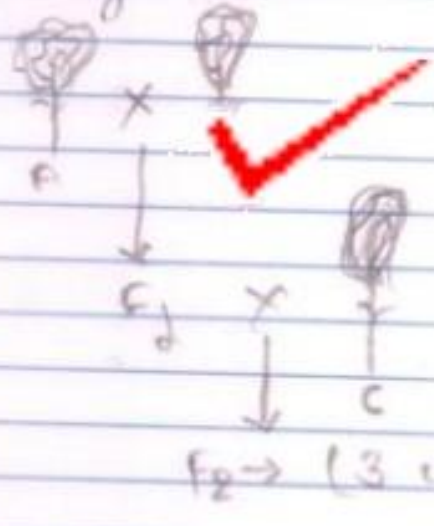
Conventional Hybrids in Maize :-

1). Single Cross :- यह 2 unrelated inbred lines के बीच संकरण कराया जाता है उससे produce progeny Single cross hybrid कहलाती है। eg- A × B

2). Double Cross :- यह Single cross से produce progeny का cross, दूसरे Single cross से produce संतति से कराते हैं, Double cross कहलाता है। eg-

(A × B) × (C × D)

3). Three Way Cross :- जब किसी एक Inbred line का cross, किसी Single cross से करते है तो उसे produce Progeny three way cross कहते है। eg. (A × B) × C



4). Modified Single Cross :- जब 2 related Inbred lines के बीच cross कराया जाता है तो उसे modified Single cross कहते है। eg. (A × A')

5). Double Modified Single Cross :- जब 2 related Inbred lines का cross कराकर produce progeny से, other 2 related Inbred lines के cross से produce progeny से कराते है, Double Modified Single cross कहते है।

eg. (A × A') × (B × B')

6) Modified Three Way Cross :- जब 2 unrelated inbred lines को cross से produce progeny को 2 related inbred lines के cross से produce progeny से cross करते है, M. T. way cross कहलाता है।

Eg. $(A \times B) \times (C \times C')$

∴ Ans - 6 (c) :-

QUESTION - 2 :-

* CCMS based world's first hybrid of pigeonpea, developed by Sardar Krishinagar Dantiwal Ag. University (SDAU), SK nagar Gujrat by using the sterile cytoplasm of cajanus cajanifolium, wild species.

* It was released by ICAR in 2004 for commercial cultivation in Gujrat & central zone of India.

Characteristics of GUTH - 1 :-

i) Intermediate growth habbit
ii) Very much stable fertility restoration
iii) Early maturing variety

iv). grains are long & bold
v). Yield → 2027 (20 q/ha)
vi) Yellow flower
vii) Green ~~leaf~~ pod with streak at base
viii) Parents :—

(♀) GAT-20 (Sterile cytoplasm of C. calamofolium) × (♂) GATR-4 → (F_1)

Ans-7(D) :-

Groundnut classification :-

Gregory et al. (1951) classified the cultivated groundnut on the basis of branching pattern, +nt or -nt of reproductive axis on main axis & arrangement of vegetative axis & arrangement of reproductive :—

1). Arachis hypogaea var. fastigata :-
* Erect in habbit
* Branching pattern - Sequential
* Inflorescence is present of terminal / primary branchy & also on main axis.
* Seed dormancy is usually absent.
* Foliage - light green colour.

It includy

4 varieties :-
Variety fastigata,
Variety peruviana,
Variety aquatorium,
Variety Vera

2). Arachis hypogaea Var. hypogaea :-
* Semi spreading or spreading in habbit
* Branching alternate / sequential
* Seed dormancy usually present
* Foliage - dark green colour
* Inflorescence absent on main axis, present on primary branches.

9t

Includes 2 variety :-

- Sub-species hypogaea (2 type) → Bunch type
  → spreading type
- Peruvian runner

Paper Code

7

Ans-1 (E) :-

Hy (Hybrid Cotton) :-

* इसे डा० (C.T.) Patel द्वारा Gujarat Agricultural University में Research farm हैं पर Surat में 1970 में develope किया गया।
* डा० C.T. Patel को Father of hybrid cotton technology भी कहते हैं।
* इस hybrid को डा० C.T. patel की cotton की Gossypium & hirsutum मध्य cross करवा कर 2 varieties develope किया गया है इसे भी intraspecific / intervarietal hybrid कहते हैं।

Parents :-

G-67 (Gujarat) × American nectariless

↓

HY (Cotton hybrid)

* इस hybrid की yield भी बहुत अधिक और better भी है। इस adaptation quality के कारण Gujarat के अलावा M.P., Maha, Karnatka & A.P. में भी commercially large scale में grow होता है।
* It is developed by hand emasculation & pollination

Paper Code

:Ans-1(F):-

Chemical Induced Male sterility :- The male sterility which is produced by using the pollen gametocidey or chemical hybridizing agent, called " Induced male sterility.

* This type of m.s. is non-genetic male sterility
* 1st reported by → Moore & Naylor
* To produce male sterility the gametocide should spray atleast 2 weeks before the flowers open, they remain active for 2-3 weeks.

Effect of C.G. M.S over male sterility :-

i). No need of maintainer line (B line)
No fertile segregants occur
No deliterious effect of cytoplasm (sterile cytoplasm) on hybrids of cotton.

Pollen gametocide ⇒ M.H., TW-1123, Abscic acid, α & β radiation etc

Paper Code

9

: Section - 9 :-

: Any 3 :- (3)

: Maize :-

Botanical Name - Zea mays
Chromosome No - 2n = 2x = 20
C.O. origin - Mexico
Family → Gramineae (Poaceae)
Poll. → Cross-poll. crop

Wild Relatives of Maize :-

Zea mexicana	2n = 2x = 20	(Annual diploid)
Zea perennis	2n = 4x = 40	(Perenial tetraploid)
Zea diploperunis	2n = 2x = 20	(perenial diploid)

Hanginte

* Hanginte से maize का यह इथान्तरण Selection, mutation, hybridigation, genetic drift के कारण हुआ है जो आज हमें maize इस रूप में दिखाई देता है।

* Zea mexicana को maize का Progenitor माना जाता है।

Breeding Objectives :-

Breeding in maize is done for different purposes :-

i). Development of high yielding varieties.
* more no. of cobs/plant,
* more no. of tiny/cob,
* more no. of grains/line,
* heavy/high test weight,
* High shelling percentage.

ii). Development of early maturing varieties

iii). Development of varieties for specific area & for conventional & new cropping pattern.

iv). Breeding for disease resistant varieties.

v). Breeding for insect-pest resistant varieties eg- maize stem borer, sorghum & maize fly.

vi). Breeding for varieties for alternate source of male sterile line.

vii). Breeding for varieties having different abiotic condition tolerance capacity
* waterlogging
* Alkalinity/Salinity
* Drought

viii). Breeding for varieties having high quality protein :- the protein in maize is zein, deficient in lysine & tryptophanes. By introducing

opaque-2-gene (o_2) maize protein consists both of good amount amino acids

ix). Breeding for lodging resistance varieties.

Breeding Methods :-

∵ Maize is a cross-pollinated crop so all the breeding methods which is used in improvement of cross pollinated crop, will be used & also modern technique methods :-

1). Introduction
2). Population improvement :
A). Without progeny test
* Mass selection
* Modified mass selection

B). With Progeny test :
a). Ear to row method
b). Modified ear to row method
c). Recurrent selection :-
i). Simple recurrent selection
ii) Recurrent selection with GCA
iii). Recurrent selection with SCA
iv). Reciprocal recurrent selection

3). Mutation Breeding
4). Polyploidy Breeding

Paper Code

12

5) Heterosis breeding

Modern Techniques :-

1). Tissue culture
   a). Anther culture
   b). Somatic cell P culture
   c). Protoplast culture (genetic engineering)
   d). Embryo culture

2). DNA polymer Technique

Paper Code

13

:- Section - C :-

:- Ans - 7 :-

:- Cotton :-

Species	Others name	Ch. no. (2n)	Origin
Gossypium arboreum	Desi / Asiatic Cotton	26 (diploid)	India
Gossypium herbaceum	(old world Cotton) Asiatic / Desi Cotton	26 (diploid)	Africa
Gossypium barbadense	Egyptian / Sea Island Cotton	52 (tetraploid)	Peru
Gossypium hirsutum	American upland Cotton	52 (tetraploid)	America

* Progenitor → Gossypium arboreum & Gossypium herbaceum → Gossypium africanum

* Go. barbadense & Go. hirsutum → [Gossypium africanum × Go. wormendii]

* Go. barbadense & Go. hirsutum are also called new world Cotton, extra long fibre & good quality fibre

∴ Hybrid Seed Production of Cotton :-

1). 3 Line System (CMS) used in hybrid seed production.

∴ Hybrid Seed Prod. :-

Procedure :-

i) Development of Parental line
ii) Seed production of " line
iii) Hybrid Seed production of cotton

A = female line / male sterile line
B = maintainer line
R = Restorer line

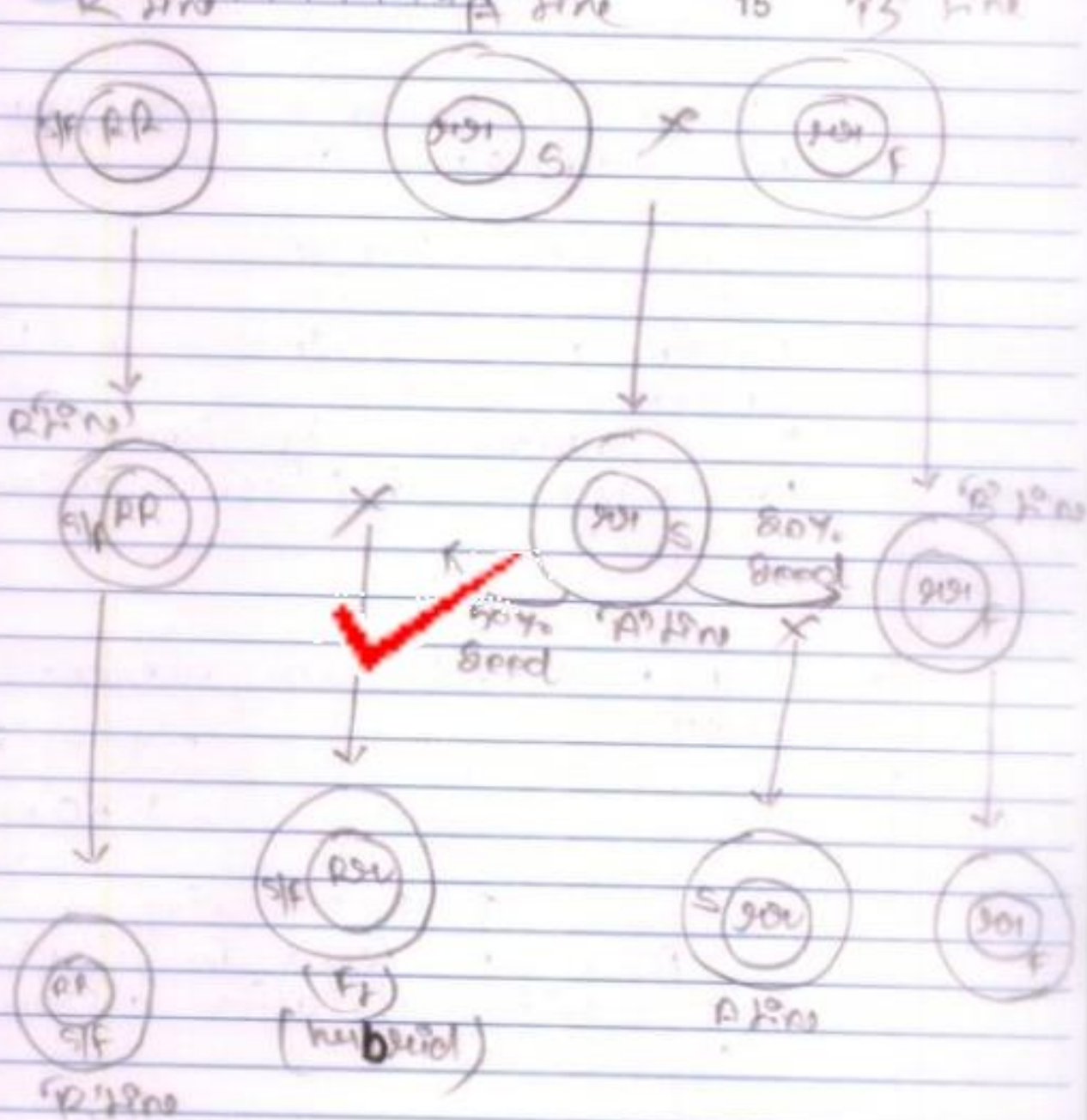
∴ Production :-

Seed Multiplication work at different stages &

i) Four Breeder Seed → A(A×B), B & R line
ii) Foundation Seed → A(A×B), B & R line
iii) Certified Seed → A & R line are crossed under isolation distance to produce hybrid

Paper Code

15



Commercial Hybrid Seed Production Technique :-

1). Land Requirement :-

- Soil ⇒ black cotton soil
- Land levelled, good drainage system.
- free from off type plants.

2). Isolation Distance :-
30 m isolation distance from on all sidy from mother field.

3). Brief Cultural Practices :-

A). Field preparation :-
1 deep ploughing 20-25 cm by MB plough
2-3 shallow " by harrow
Pre sowing irrig / is necessary.

B). Seed & Sowing :-

- Seed purchased from authenticated source.
- Seed rate → ♂ ⇒ 3.75 kg/ha
  → ♀ ⇒ 2.50 kg/ha
- Method :- ♀ & ♂ lines are grown in same field in different lots with isolation distance of 5 m.
- Depth → 4-5 cm
- Row ratio :- 4:1 or 5:1 (♀ : ♂).

C). Border rows :- 5 rows of ♂ to prevent foreign pollen.

Paper Code

17

D). Fertilizers :-
120 : 80 - 60 : 60 kg NPK/ha
→ ½ dose N & full P & K_2O ⇒ at sowing
→ ½ → ¼ ⇒ at thinning
→ ¼ ⇒ at 1st flowering

E). Irrigation :-
3 stages are susceptible
→ 30-35 DAP
→ flower bud initiation
→ Maturing stage or flowering stage

F). Weed Management :-
1) Hand weeding → 20-35 DAS
→ 40-45 DAS
→ Diuron @ 2.5 kg/ha
→ Butachlor @ 1-1.5 kg/ha
→ 2-4, D - Na salt → 1.0 kg a.i/ha

G). Insect - Pest Management :-
i) Pink boll worm
ii) Cotton boll worm
iii) Cotton white fly
Ctrl → Monocrotophos or Malathion @ 10D
20-25 kg/ha

H) Disease Management :-
Fungal → Mancozeb @ 2.5 kg/ha
Anthracnose → Seed treatment
spray Tebuconazole @ 1.5 kg/ha

9). Rouging :- Removal of off type plant from main field is called roguing.

3 stages :-

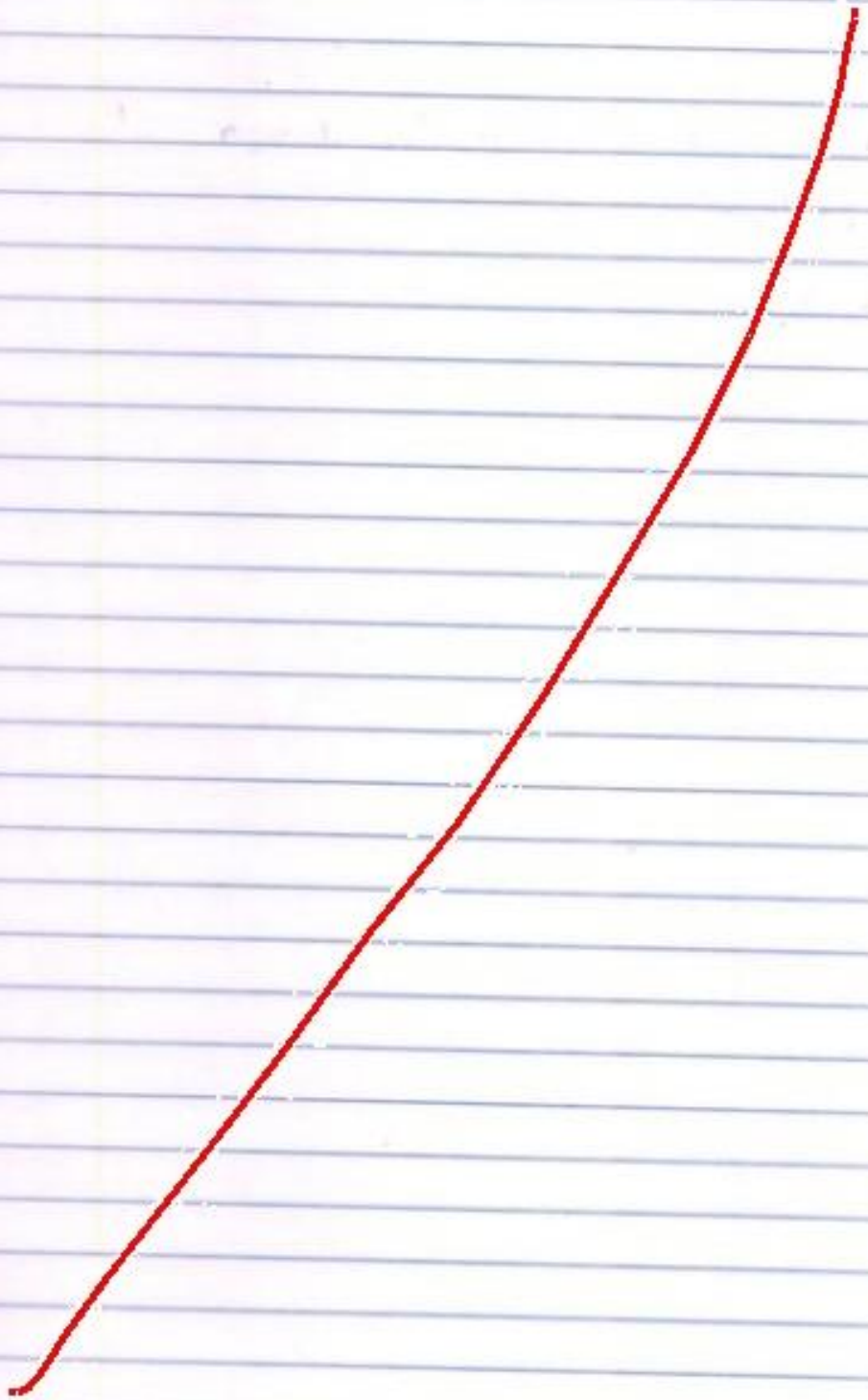
at →

* Preflowering
* at flowering
* at maturing

I). Fully ripened balls are picked, cleaned & Packed in gunny bag

Paper Code

19



Paper Code

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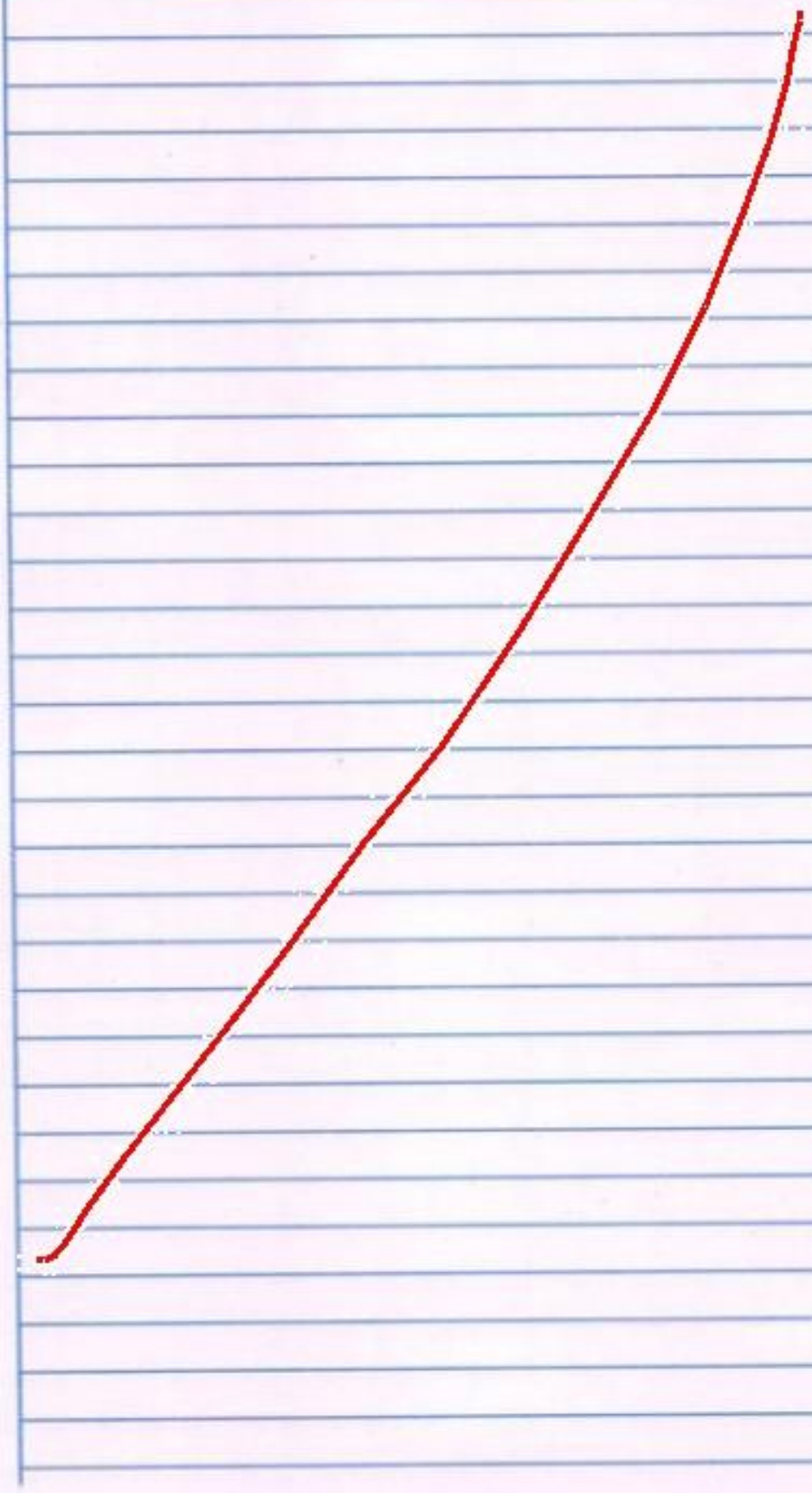

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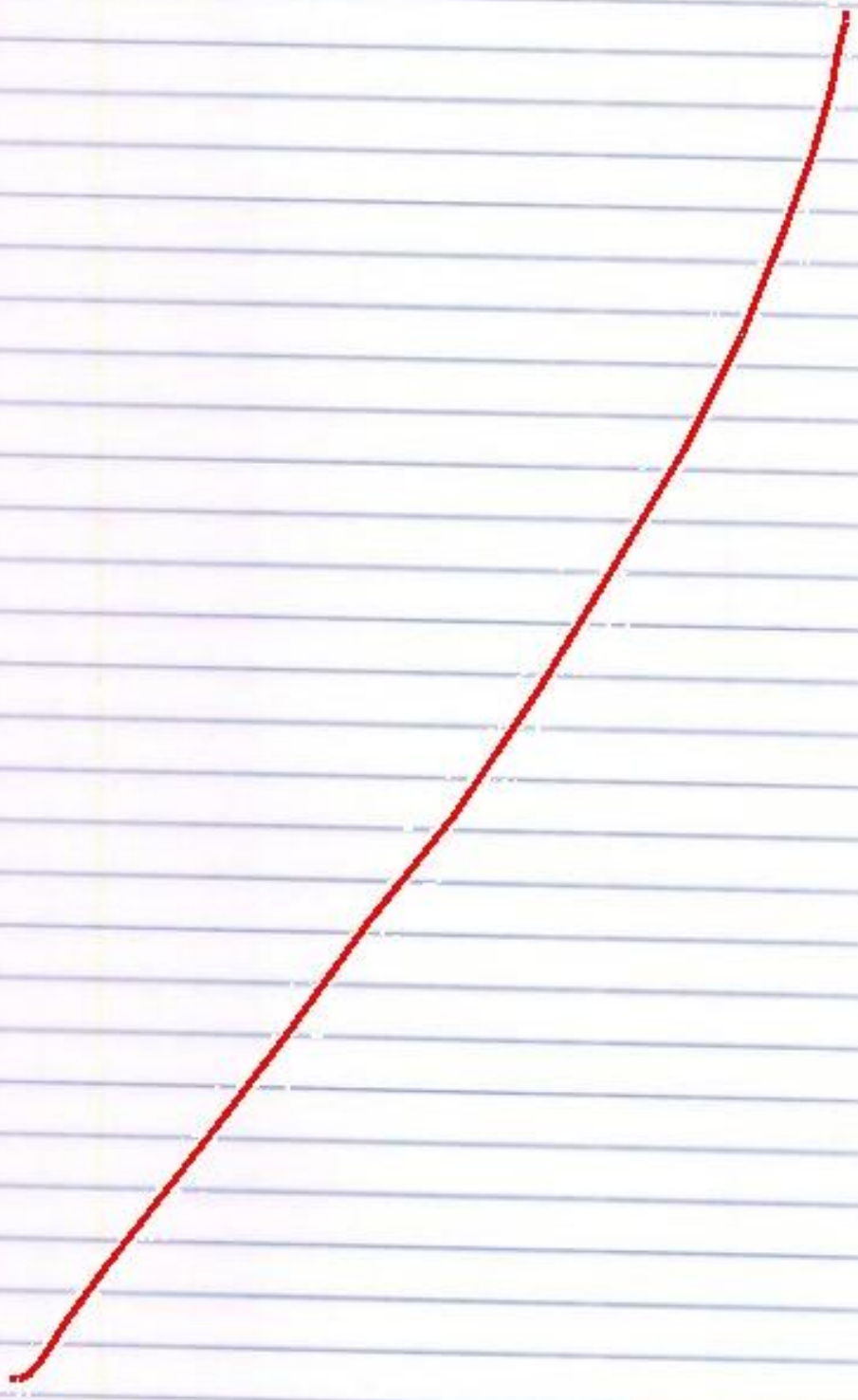

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22

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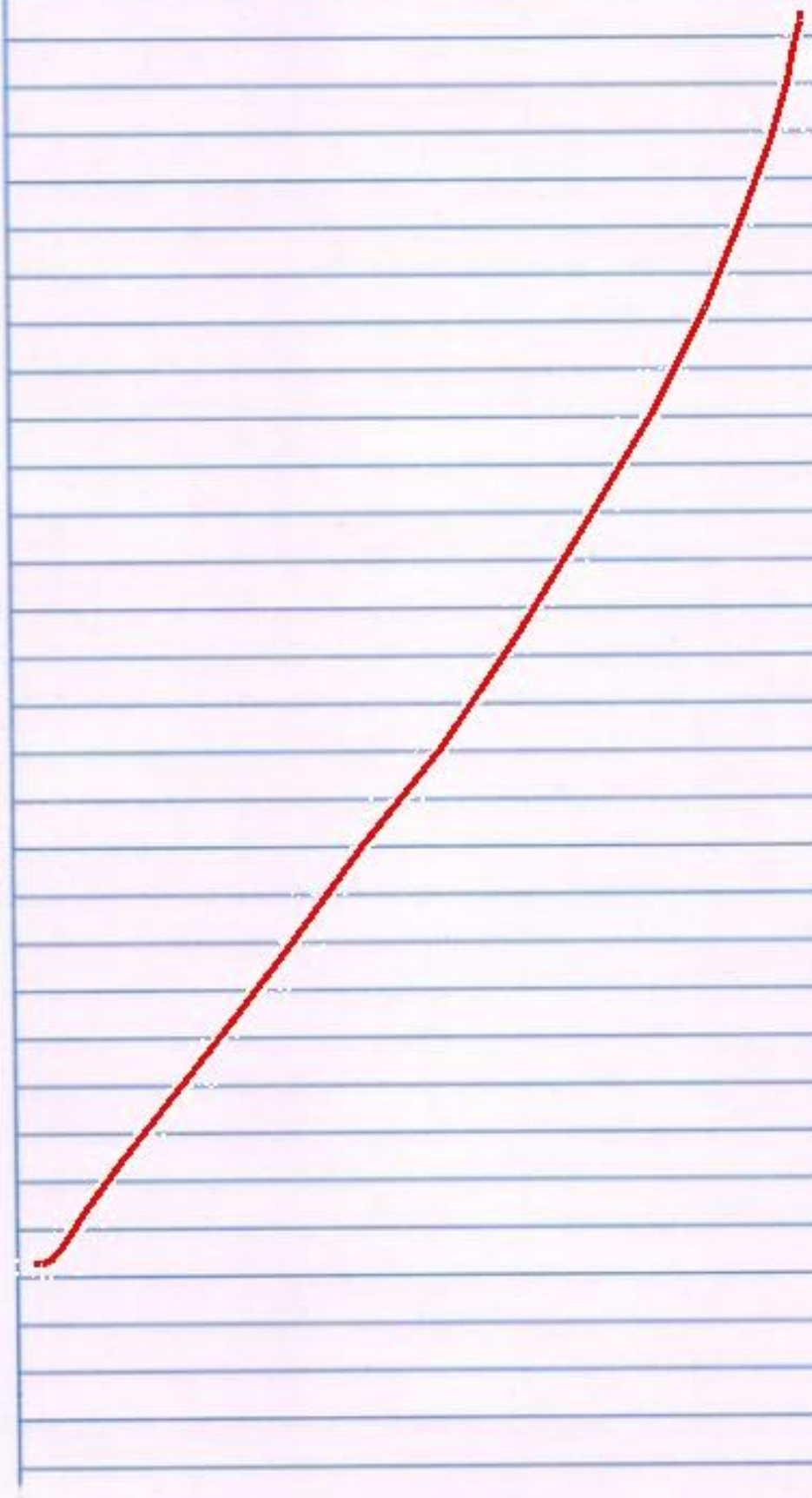

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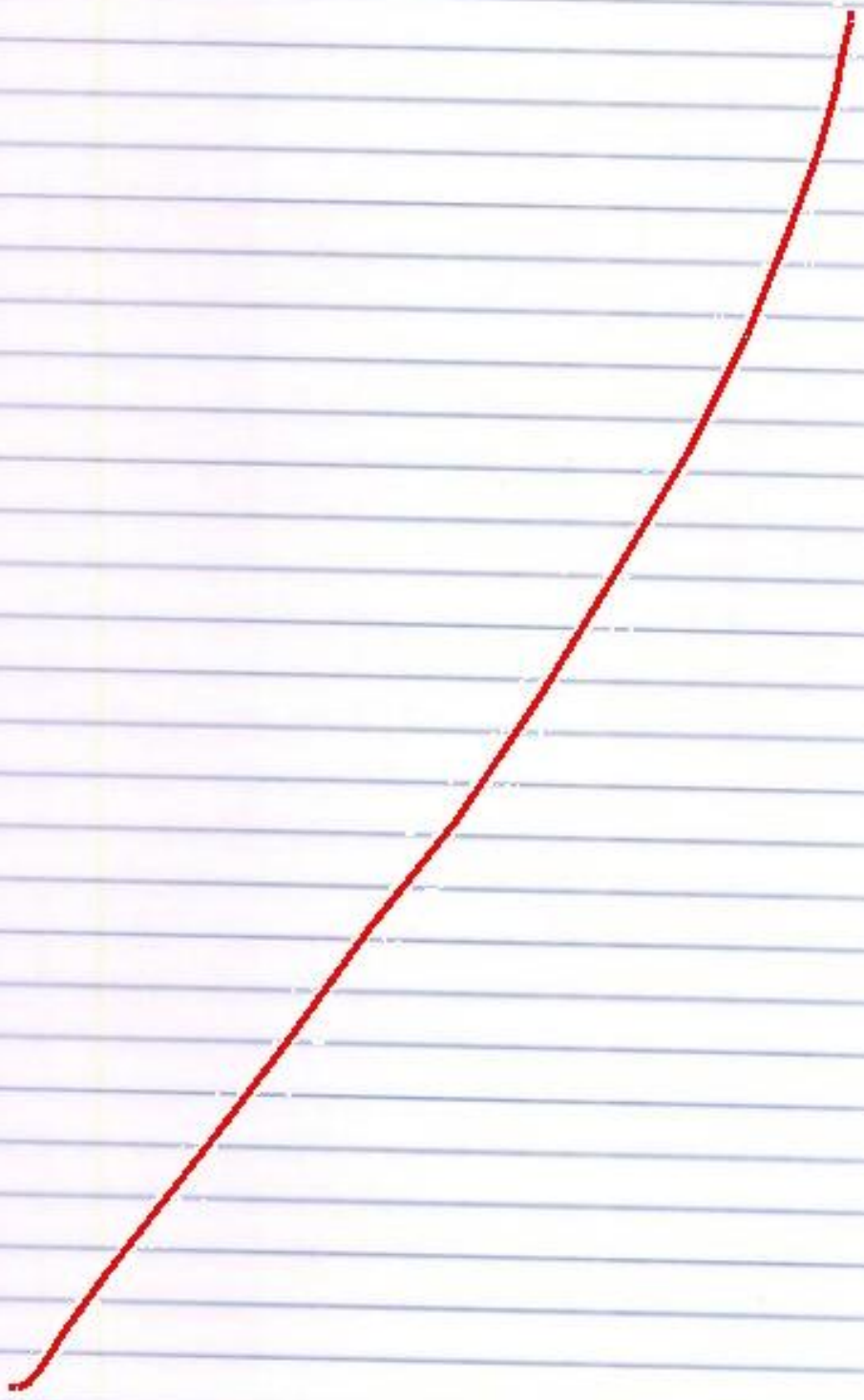

Paper Code

24

Do Not Write anything in this Portion