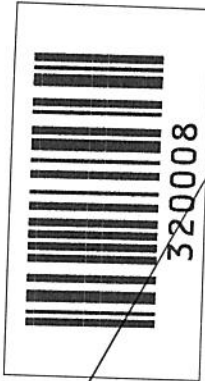


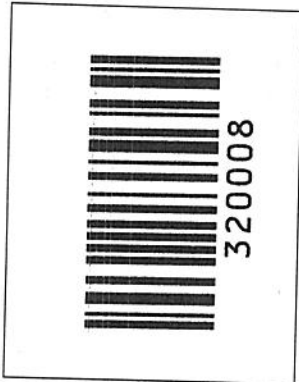
Subject : Agricultural Engg. - I



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| Total Pages : | |
| Time | 3 Hours |
| Maximum Marks : | 200 |

PART - I

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| Paper Code | 07 |
| Subject | Agricultural Engg. - I |



TO BE FILLED BY THE CANDIDATE

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|----------------------------|--------------------|
| Roll No. (In words) | |
| Name of the candidate | <i>S. S. S.</i> |
| Date of Birth (DD/MM/YYYY) | <i>20/02/2000</i> |
| Father's Name | |
| Signature of the candidate | <i>[Signature]</i> |
| Date of Examination | |

112

Roll No.

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| 9 | 9 | 9 | 9 | 9 | 9 |

Invigilator must check the Roll No. and Photo ID. of the candidate, then Sign. here :

TO BE FILLED BY INVIGILATOR

If candidate found using unfair means then Invigilator should fill up this bubble with black/blue ball pen & report to the Centre Superintendent:



IMPORTANT NOTES

महत्त्वपूर्ण निर्देश

- (A) Please fill up the OMR Sheet of this Question-Answer Booklet properly before answering.
प्रश्नोत्तर पुस्तिका में प्रश्न हल करने से पूर्व उसके संलग्न ओ.एम.आर. पत्रक को भली प्रकार से भर लें ।
- (B) The question paper is divided into different unit and parts. The number of questions to be attempted and their marks are indicated in each unit and parts.
प्रश्न-पत्र विभिन्न यूनिट एवं भागों में विभाजित है । प्रत्येक यूनिट एवं भाग में से किये जाने वाले प्रश्नों की संख्या और उनके अंक उस यूनिट एवं भाग में अंकित किये गए हैं ।
- (C) Attempt answers either in **Hindi or English**, not in both. For Language Papers, answer in concerned language and script, unless directed otherwise to write in Hindi or English specifically.
उत्तर अंग्रेजी या हिन्दी भाषा में से किसी एक में दीजिये, दोनों में नहीं । भाषा विषयक प्रश्नों के उत्तर उनकी संबद्ध भाषा व लिपि में ही दिए जाएँ, जब तक कि प्रश्न विशेष के लिए अलग से हिंदी या अंग्रेजी में उत्तर देने के लिए न लिखा गया हो ।
- (D) The candidates should not write the answers beyond the prescribed limit of words; failing this, marks will be deducted.
अभ्यर्थियों को अपने उत्तर निर्धारित शब्दों की सीमा से अधिक नहीं लिखना चाहिए । इसका उल्लंघन करने पर अंक काटे जायेंगे ।
- (E) Please write answers only in the prescribed space of booklet. Do not write any mark of identity inside the Answer Script (including Paper for rough work) i.e. name, address, telephone number, Name of God etc. or any irrelevant words other than the answer of question. Such act will be treated as unfair means. The Commission may also deduct 5 marks from the marks obtained, if Roll Number is not filled correctly on the O.M.R. Sheet.
किसी भी प्रश्न का उत्तर प्रश्नोत्तर पुस्तिका में निर्धारित स्थान पर ही लिखें । प्रश्नोत्तर पुस्तिका (रफ़ कार्य के पृष्ठ सहित) के अंदर कहीं पर भी अपना नाम, रोल नंबर अथवा अन्य कोई पहचान चिह्न यथा -- प्रश्नोत्तर में नाम, पता, दूरभाष नंबर, देवताओं के नाम अथवा अन्य कोई भी प्रश्नोत्तर से असम्बंधित शब्द, वाक्य एवं अंक आदि न लिखें । ऐसा करने पर आयोग द्वारा इसे अनुचित साधन अपनाने का कृत्य माना जायेगा । ओ.एम.आर. पत्रक पर रोल नम्बर का त्रुटिपूर्ण अंकन करने पर आयोग द्वारा उसके प्राप्तियों में से 5 अंक भी काटे जा सकते हैं ।
- (F) Candidates are directed that they should not write (answer) out side the border line in every page. Answer written out side the border line will not be checked by the Examiner.
अभ्यर्थियों को निर्देशित किया जाता है कि प्रश्नोत्तर पुस्तिका में प्रत्येक पृष्ठ में बनाई गई बार्डर लाईन से बाहर प्रत्युत्तर नहीं लिखें । बार्डर लाईन के बाहर लिखे गये उत्तर को परीक्षक द्वारा जाँचा नहीं जायेगा ।
- (G) If there is any sort of ambiguity/mistake either of printing or factual nature then out of Hindi and English version of the question, the English version will be treated as standard.
यदि किसी प्रश्न में किसी प्रकार की कोई मुद्रण या तथ्यात्मक प्रकार की त्रुटि हो तो प्रश्न के हिन्दी तथा अंग्रेजी रूपान्तरों में से अंग्रेजी रूपान्तर मान्य होगा ।
- (H) It should be ensured that the Question-Answer Booklet is provided in a sealed envelope to the candidate.
अभ्यर्थी यह सुनिश्चित कर लें कि अभ्यर्थी को प्रश्नोत्तर पुस्तिका सीलबंद लिफाफे में प्रदान की गई है ।
- (I) Candidate should fill up all desired details on this attached OMR sheet of Question-Answer Booklet with **blue** ball point pen. Please ensure that this OMR Sheet is not torn or damaged.
अभ्यर्थी प्रश्नोत्तर पुस्तिका के ऊपर संलग्न इस ओ.एम.आर. पत्रक पर सभी वांछित विवरण **नीले** बॉल पेन से सावधानीपूर्वक भरें । ध्यान रखें कि यह ओ.एम.आर. पत्रक कहीं से कटे-फटे नहीं अथवा किसी भी प्रकार से क्षतिग्रस्त नहीं हो ।
- (J) This **OMR** Sheet consists of **Two** parts, in which some information is pre-printed; remaining details have to be filled by the candidate.
यह ओ.एम.आर. पत्रक दो भागों में बंटा है, जिसमें कतिपय सूचनाएँ पूर्वमुद्रित हैं । शेष की पूर्ति अभ्यर्थी को करनी है ।
- (K) If the Question-Answer Booklet is torn or not printed properly, bring it to notice of invigilator and change the Question-Answer booklet, otherwise the candidate will be liable for that.
यदि प्रश्नोत्तर पुस्तिका कहीं से कटी-फटी या अमुद्रित है, तो अभिजागर के ध्यान में ला दें तथा उसे बदलवा ले, अन्यथा उसका दायित्व अभ्यर्थी का होगा ।

विशेष नोट :

अभ्यर्थी द्वारा यदि ओ.एम.आर. पत्रक पर गलत सूचना भरी जाती है या उसे किसी प्रकार की क्षति पहुँचाई जाती है अथवा उस पर किसी प्रकार का पहचान चिह्न अंकित किया जाता है, तो आयोग द्वारा संपूर्ण परीक्षा हेतु अभ्यर्थिता निरस्त की जा सकेगी और उसके लिए अभ्यर्थी उत्तरदायी होगा ।

Special Notes :

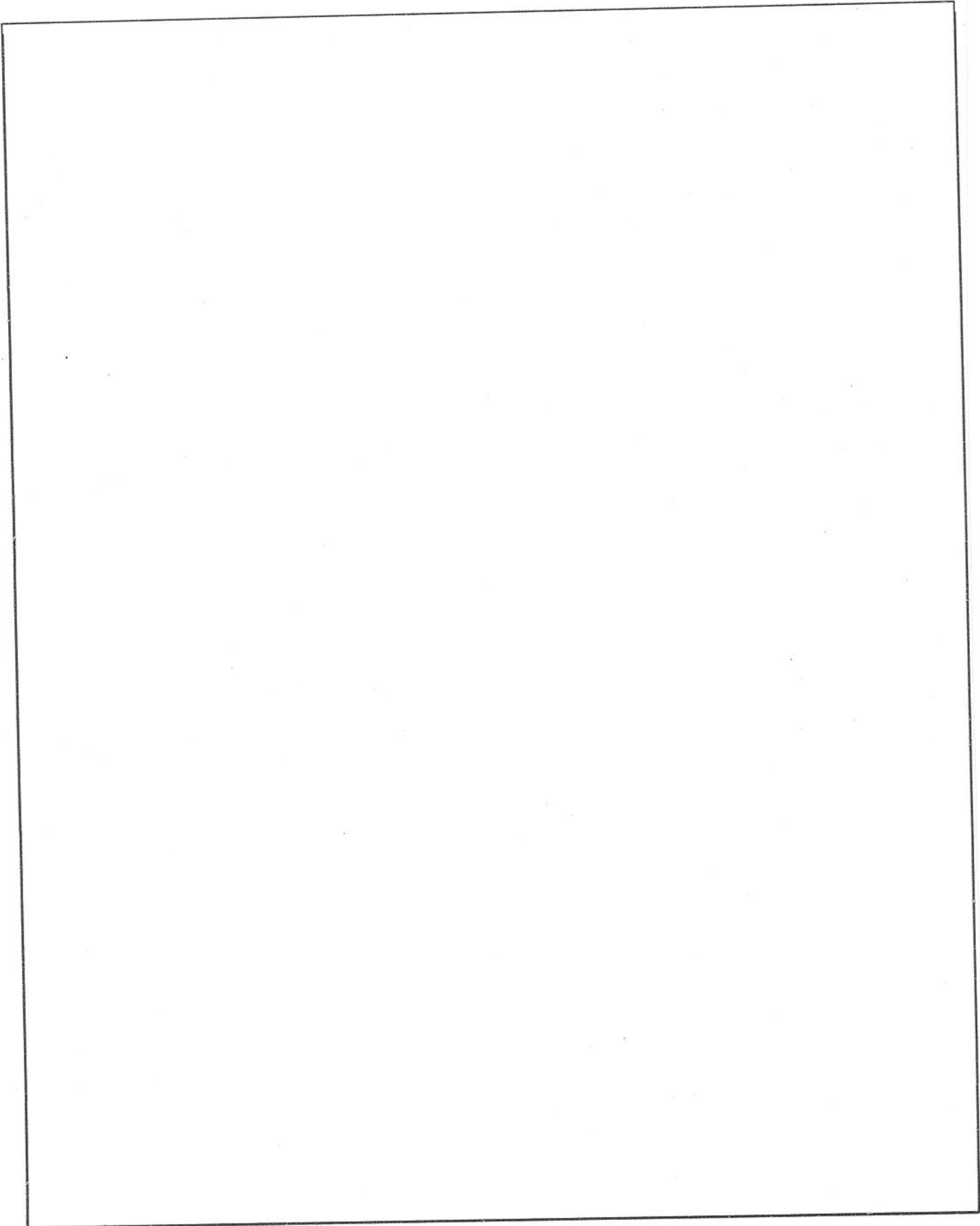
If there is any wrong information filled by the candidate or any attempt is made to damage it or any marking as identification is done, then his candidature for the entire examination shall be rejected by the commission, for which he will be liable.

07

4



SPACE FOR ROUGH WORK





Paper – I
AGRICULTURAL ENGINEERING – I

(Total 200 Marks)
(Total 37 Question)

PART – A

Note : Attempt all **twenty** questions. Each question carries **2** marks. Answer should not exceed **15** words.

1. Define ϕ index.

2. Define sheet erosion.

3. What is effective rainfall ?

4. Define unit hydrograph.



5. Define duty of irrigation water.

6. What is Cipoletti weir ?

7. What is intensity of irrigation ?

8. Define reference evapotranspiration.



9. A drainage canal discharge $0.32 \text{ m}^3/\text{sec}$ and drains 260 hectare. What is drainage coefficient of this land ?

10. What is Darcy's Law ?

11. Define relief drain.

12. What is pump efficiency ?



13. Define specific speed of pump.

14. Define velocity head.

15. Define minor irrigation.

16. What is Piezometric surface ?

17. Define perched water table.



18. What is hygroscopic water ?

19. Calculate the farm conveyance efficiency when a stream of 95 l/s received at the farm gate after being delivered from a canal delivered 72 l/s to the field.

20. What is Reduced Level ?



PART – B

Note : Attempt all **twelve** questions. Each question carries **5** marks. Answer should not exceed **50** words.

21. Classify hydrologic soil groups based on infiltration characteristics.

22. Write the mechanics of sediment transportation in water erosion.



23. Water is flowing in a 10 cm ID pipe at a velocity of 20 m/s. If the pipe is enlarged to 20 cm ID, calculate the velocity and pressure head at this section.

24. Determine the capacity for a sprinkler irrigation system to irrigate 16 hectare of maize crop. Design crop water requirement is 5 mm per day. Moisture replaced in soil at each irrigation is 6 cm. Irrigation efficiency is 70%. Irrigation period is 10 days in a 12-days interval. The system is to be operated for 20 hours per day.



25. Write down the different factors responsible for water logging problems in India.

26. Describe herringbone system of tile drainage with the help of neat sketch.



27. Express the relationship between pump speed and BHP in the performance of centrifugal pump.

28. Write the criteria for selection of irrigation pumps.



29. Define well screen. What are the basic requirements of well screen ?

30. A pump is discharging at 4500 litre per minutes of water at 15 m head. If the HP of motor is 20 and motor efficiency is 80%, calculate the pump efficiency.



31. Determine the R.L. of different stations from the following observations :

R.L. of B.M. is 100 m.

| Station | A | B | C |
|---------|------|------|------|
| B.S. | 3.78 | 2.12 | 3.88 |
| F.S. | 2.16 | 1.51 | 2.12 |
| R.L. | | | |



32. Differentiate between tie line and check in surveying.



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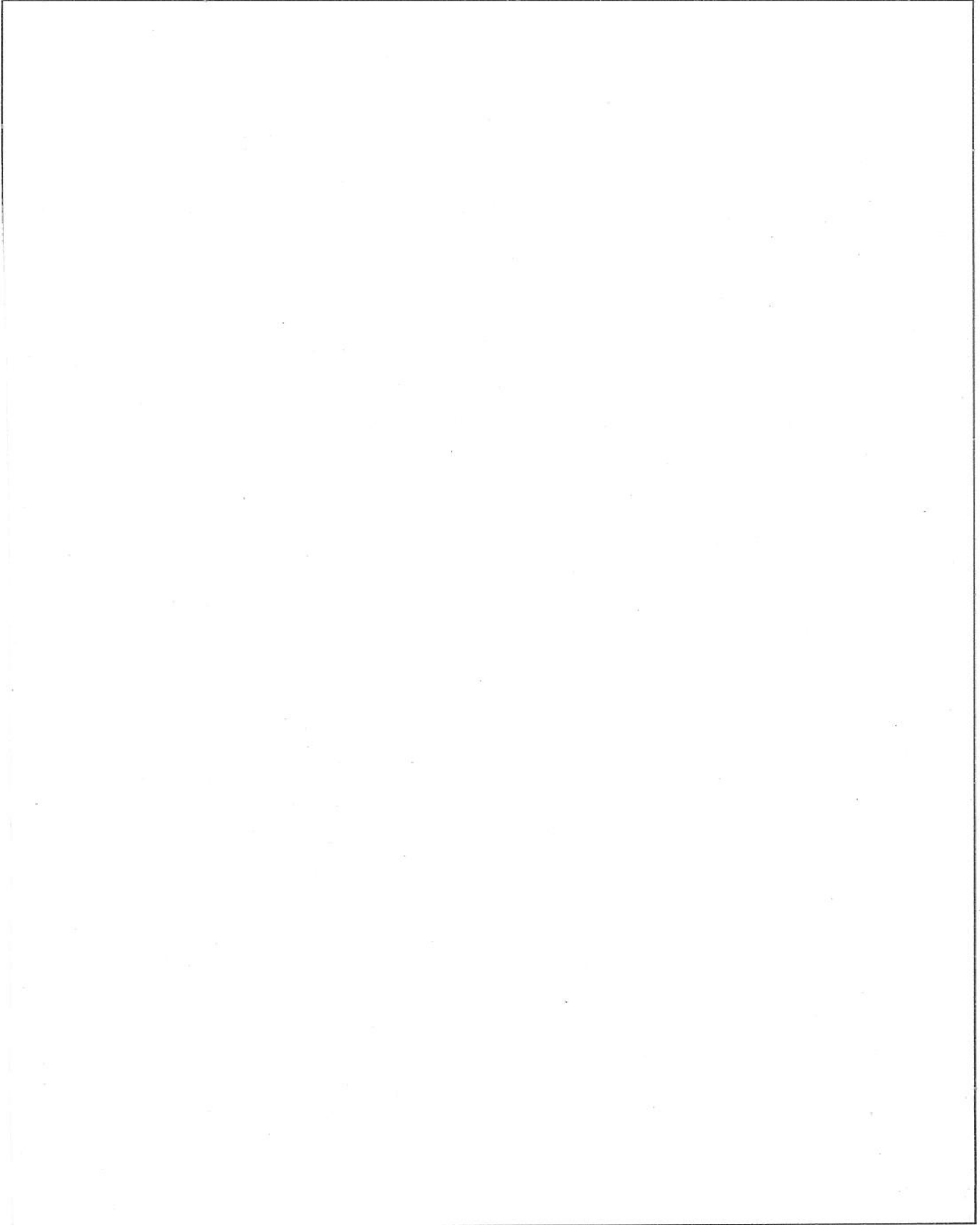
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07

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SPACE FOR ROUGH WORK





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