DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

23-0009-AC

TEST BOOKLET
AGRICULTURE
PAPER – I

(Time Allowed: 3 hours) (Maximum Marks: 300)

INSTRUCTIONS TO CANDIDATES

Read the instructions carefully before answering the questions:

1. This Test Booklet consists of **16(sixteen) pages** and has **75 (seventy-five) items (questions)**.
2. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS BOOKLET *DOES NOT* HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
3. **Please note that it is the candidate's responsibility to fill in the Roll Number and other required details carefully and without any omission or discrepancy at the appropriate places in the OMR Answer Sheet and the Separate Answer Booklet. Any omission/discrepancy will render the OMR Answer Sheet and the Separate Answer Booklet liable for rejection.**
4. Do not write anything else on the OMR Answer Sheet except the required information. Before you proceed to mark in the OMR Answer Sheet, please ensure that you have filled in the required particulars as per given instructions.
5. Use **only Black Ball Point Pen** to fill the OMR Answer Sheet.
6. This Test Booklet is divided into 4 (four) parts – **Part – I, Part – II, Part - III** and **Part – IV**.
7. All three parts are **Compulsory**.
8. **Part-I consists of Multiple Choice-based Questions.** The answers to these questions have to be marked in the **OMR Answer Sheet** provided to you.
9. **Part-II, Part-III and Part-IV consist of Conventional Essay-type Questions.** The answers to these questions have to be written in the separate **Answer Booklet** provided to you.
10. In Part-I, each item (question) comprises of 04 (four) responses (answers). You are required to select the response which you want to mark on the OMR Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose *ONLY ONE* response for each item.
11. After you have completed filling in all your responses on the OMR Answer Sheet and the Answer Booklet(s) and the examination has concluded, you should hand over to the Invigilator *only the OMR Answer Sheet and the Answer Booklet(s)*. You are permitted to take the Test Booklet with you.
12. **Penalty for wrong answers in Multiple Choice-based Questions:**

THERE WIL BE **PENALTY** FOR WRONG ANSWERS MARKED BY A CANDIDATE.

(i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **one-third** of the marks assigned to the question will be deducted as penalty.

(ii) If a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above to the question.

(iii) If a question is left blank. i.e., no answer is given by the candidate, there will be **no penalty** for that question.

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PART - I
(Multiple Choice-based Questions)

Instructions for Questions 1 to 50:

- ***Choose the correct answers for the following questions.***
- ***Each question carries 3 marks.*** ***[3x50=150]***

1. Agro-climatic conditions mainly refer to different components which influences the type of vegetation. Among the given components, which one of the following is not related to it?
   (a) Soil types
   (b) Rainfall
   (c) Temperature
   (d) Air

2. The Eastern Himalayan Region includes Arunachal Pradesh, the hills of Assam, Sikkim, Meghalaya, Nagaland, Manipur, Mizoram, Tripura, and the Darjeeling district of West Bengal. There are different types of crops cultivated in this region. Find the crop combination which is practiced in this region?
   (a) Rice, maize, potato, tea
   (b) Rice, wheat, potato, tea
   (c) Rice, oat, cotton, tea
   (d) Maize, oat, potato, tea

3. The extreme difference in temperatures during the day and night in the deserts is due to -
   (a) Presence of carbon dioxide in low concentrations in desert regions due to which heat escapes easily
   (b) Lack of moisture leading to escape of heat
   (c) Sand having high heat conduction properties
   (d) All of the above

4. Which of the following is not the revised mandate of National Centre for Organic and Natural Farming (NCONF)?
   (a) To develop facilities for testing, training, screening, monitoring and quality assessment of organic and natural farming products including facilities for agrochemical residue testing.
   (b) To develop standards and testing protocols for various organic agricultural farm implements.
   (c) Promotion of chemical free agricultural systems like organic, natural, regenerative farming in the country through capacity building of stakeholders.
   (d) To serve as nodal quality control laboratory for analysis of bio-fertilizers and organic fertilizers as per the requirement of Fertilizer Control Order, 1985 (FCO).

5. Find the correct statements about Minimum Support Price (MSP) from below:
   1. Minimum Support Price (MSP) is a form of market intervention by the Government of India to insure agricultural producers against any sharp fall in farm prices.
   2. MSP is price fixed by Government of India to protect the producers, farmers against excessive fall in price during bumper production years.
   3. The minimum support prices are a guarantee price for their produce from the Government.
   4. The major objectives are to support the farmers from distress sales and to procure food grains for public distribution.

   Select the correct answer using the codes given below:
   (a) 1 and 3
   (b) 1, 2, 3 and 4
   (c) 2, 3 and 4
   (d) 1, 3 and 4

6. The 10 elements of Agroecology framework was launched at the Second FAO International Symposium on Agroecology held in April 2018. Among the different combinations, which are not the elements related to Agroecology?
   (a) Diversity, co-creation and sharing of knowledge and synergies
   (b) Efficiency, recycling and resilience
   (c) Economic value, human ethics and crop ecology
   (d) Human and social values, culture and food traditions and responsible governance

7. Find the statement not relevant to Extension Education -
   (a) Learners are heterogeneous and have diverse goals
   (b) It is largely outside the four walls of the institution
   (c) Approach is from principles to problems
   (d) The extension worker also learns from those who he teaches

8. KVKs have been functioning as knowledge and resource centres of agricultural technology supporting initiatives of public, private and voluntary sector for improving the agricultural economy of the district. From the following find the statement which is not related to it -
   (a) It is an integral part of the Regional Agricultural Research System (RARS)
   (b) In 1974, ICAR appointed Mohan Singh Mehta Committee to formulate KVK scheme.
   (c) On-farm testing to assess the location specificity of agricultural technologies under various farming systems is one of its mandates.
   (d) The KVK scheme is 100% financed by Government of India

9. Which of these is not allowed in organic cultivation?
   (a) Sewage sludge
   (b) Crop rotation
   (c) Cover crops
   (d) Buffer zones

10. Greenhouse gas concentrations drastically changed from 1750 to 2019 and maximum was observed in -
    (a) Carbon dioxide
    (b) Methane
    (c) Nitrous oxide
    (d) Ozone

11. Find from the following the statements which is not relevant to Agroforestry -
    (a) Production of multiple outputs with protection of the resource base
    (b) Places emphasis on the use of multiple indigenous trees and shrubs
    (c) It is structurally and functionally less complex than monoculture
    (d) Particularly suitable for low-input conditions and fragile environments

12. Find the correct combination of practices for Silvopasture -
    (a) Tree, Forage, livestock
    (b) Pulse, Forage, Livestock
    (c) Tea, Forage, Livestock
    (d) Cereal, Forage, Livestock

13. The ratio of the quantity of water stored in the root zone of the crops to the quantity of water actually delivered in the field is termed as -
    (a) Water conveyance efficiency
    (b) Water application efficiency
    (c) Water use efficiency
    (d) None of the above

14. Which of the following is not a category for classification of weeds?
    (a) Morphology
    (b) Life cycle
    (c) Habitat
    (d) Colour

15. Find the wrong combination of the given pairs -
    (a) Wild safflower - *Carthamus oxycantha*
    (b) Canada thistle - *Cirsium arvense*
    (c) Cocklebur - *Xanthium strumarium*
    (d) Cowage - *Lucuna pruriens*

16. Oil quality of mint is impaired by -
    (a) *Mikania micrantha*
    (b) *Cirsium arvense*
    (c) *Cichorium intybus*
    (d) *Argemone Mexicana*

17. Leaves of lantana cause acute photosensitivity and jaundice in animals which is due to the toxic principle of -
    (a) Lantanic acid
    (b) Lantadene
    (c) Lantadrine
    (d) Linianic acid

18. Anand 2, Sirsa - 9, IGFRI S – 244 are the varieties of -
    (a) Lucerne
    (b) Cowpea
    (c) Hybrid Napier
    (d) Oat

19. Wheat flour contaminated with seeds of _____ give bitter taste to the bread and irritates the gastric tract of the consumer.
    (a) Mexican poppy weed
    (b) *Parthenium hysterophous*
    (c) Cocklebur
    (d) Common rag weed

20. Find the incorrect statement about the limitations of green manures -
    (a) Managing green manure improperly or without additional chemical inputs may limit crop production.
    (b) Mixing green manures into the soil without enough time before crop planting could stop phosphorus mobilization.
    (c) When nitrogen stops flowing there will not be enough nutrients for the next crop planting.
    (d) Farming systems with short growth spans for green manure are not usually efficient.

21. Which of the following are the effects of pollution on plants?
    1. Mottled foliage and stunted growth
    2. Burning of leaf tips or margins and delayed maturity
    3. Twig dieback and premature leaf drop
    4. Increase of blossoms and reduced yield or quality

    Select the correct answer using the codes given below.
    (a) 1, 2 and 3
    (b) 1, 2 and 4
    (c) 2, 3 and 4
    (d) 1, 3 and 4

22. Which of the following is an incorrect combination?
    (a) *Chenapodium album* - Lamb's-quarters
    (b) *Vicia spp* - Vetches
    (c) *Avena fatua* - Wild oat
    (d) *Phalaris minor* - Dwarf grass

23. Fibre crops can be classified into the following types based on the part(s) of the plant from which fibres are extracted. Which one of the following is correct?
    (a) seed fibre (e.g. cotton, coconut husk coir, kapok, milkweed and luffa)
    (b) bast fibre (e.g. flax, hemp, kenaf, jute, nettle and ramie)
    (c) root fibre (e.g. sunhemp, sweet potato)
    (d) leaf fibre (e.g. sisal, abaca, yucca,)

24. Mid-season drought in cropping system can be managed by -
    1. Top dressing
    2. Foliar spray of urea at 2%.
    3. Reducing the leaf area index by removing every alternate or third row of crop
    4. Closing the soil cracks by repeated deep interculturing

    Select the correct answer using the codes given below:
    (a) 1, 2, 3 and 4
    (b) 1, 2 and 3
    (c) 2, 3 and 4
    (d) 1, 3 and 4

25. Why are adjuvants added with herbicide?
    1. Adjuvants do not act by increasing the innate activity of herbicide
    2. Adjuvants enhances the activity of herbicide in the plants where it is needed
    3. In order to improve herbicidal effects
    4. To modify herbicidal activity or application characteristics

    Select the correct answer using the codes given below:
    (a) 1, 2, 3 and 4
    (b) 1, 2 and 3
    (c) 2, 3 and 4
    (d) 1, 2 and 4

26. Amino acid synthesis inhibition is one of the modes of action of weedicide. Find the weedicide which is not related to amino acid synthesis inhibition.
    (a) Glyphosate,
    (b) Sulfonyl urea
    (c) 2,4-D
    (d) Chlorimuron

27. Given are the rating limits of soil test values of organic carbon content (%). Find the most correct one:
    (a) Low (Below 0.5), Medium (0.5 – 0.75) and High (Above 0.75)
    (b) Low (Below 0.75), Medium (0.75 – 1.0) and High (Above 1.0)
    (c) Low (Below 0.05), Medium (0.05 – 0.075) and High (Above 0.075)
    (d) Low (Below 0.005), Medium (0.005 – 0.0075) and High (Above 0.0075)

28. Precision agriculture also provides farmers with a wealth of information to:
    1. Build up a record of their farm
    2. Improve decision-making
    3. Foster greater traceability
    4. Enhance marketing of farm products

    Select the correct answer using the codes given below:
    (a) 1 and 3
    (b) 1, 2, 3 and 4
    (c) Only 4
    (d) 2 and 3

29. The objective(s) of soil testing is/are: -
    1. Grouping soils into classes relative to the levels of nutrients for suggesting fertilizer practices.
    2. Predicting the probability of getting profitable responses.
    3. Helping to evaluate soil productivity.
    4. Determining specific soil conditions like alkali, salinity and acidity which limits crop yields.

    Select the correct answer using the codes given below: -
    (a) 1 and 3
    (b) 1, 2, 3 and 4
    (c) Only 4
    (d) 2 and 3

30. Social forestry is defined as -
    (a) Forestry outside the conventional forests which primarily aim at providing continuous flow of goods and services for the benefit of people.
    (b) It is the name given to programmes which promote commercial tree growing by farmers on their own land. It can be defined by NCA (1976) as the practice of forestry in all its aspects in and the around the farms or village lands integrated with other farm operations.
    (c) It is the practice of forestry in areas devoid of tree growth and other vegetation situated in places away from the conventional forest areas with the object of increasing the area under tree growth.
    (d) The degraded area under forests needs immediate attention for ecological restoration and for meeting the socio-economic needs of the communities living in and around such areas.

31. There are five stages of adoption process. Which of the following is not a stage of adoption?
    (a) Awareness
    (b) Interest
    (c) Evaluation
    (d) Experimentation

32. Based on mobility in plant, nutrient can be categorized as mobile, partially mobile and immobile. Find the correct answer from the given combinations -

(a) Mobile –Nitrogen, Partly mobile- Iron and Immobile- Calcium
(b) Mobile –Copper, Partly mobile- Iron and Immobile- Calcium
(c) Mobile –Boron, Partly mobile- Iron and Immobile- Calcium
(d) Mobile –Zinc, Partly mobile- Iron and Immobile- Calcium

33. Find the incorrect statement on the symbiotic nitrogen fixation from the following -
(a) *Sesbania rostrata* forms nodules on the stem
(b) The symbiotic association of the host and the bacterium is unilateral beneficial to both organisms
(c) *Sesbania rostrata* forms nodules on the root
(d) Some plants of leguminosae family form a symbiotic association with bacteria with the genus *Rhizobium* which fix atmospheric nitrogen.

34. The requirements of biological N fixation are -
1. An active nitrogenase enzyme system
2. Mn^{2+} and a continuous supply of ATP
3. A strong reducing agent i.e., suitable e- donor
4. Low oxygen tension

Select the correct answer using the codes given below:
(a) 1 and 3
(b) 1, 2, 3 and 4
(c) 1, 2 and 4
(d) 1, 3 and 4

35. The removal of N from the soil may be through -
1. Removal by crops and microorganism
2. Leaching
3. Immobilization
4. Soil erosion and runoff

Select the correct answer using the codes given below:
(a) 1 and 3
(b) 1, 2, 3 and 4
(c) 4 only
(d) 2 and 3

36. Which one of the following is not related to intercropping?
(a) Relay cropping
(b) Alley cropping
(c) Row cropping
(d) Test cropping

37. Gaseous loss of nitrogen from soil occurs by -
1. Ammonia volatilization
2. Denitrification
3. Chemo denitrification
4. Ammonium volatilization

Select the correct answer using the codes given below:
(a) 1 and 3
(b) 1, 2, 3 and 4
(c) 1, 2 and 4
(d) 1, 2 and 3

38. Find the incorrect combination from the following: -
(a) Complete root parasite - *Orobanche* (broom rape) in rice
(b) Partial root parasite - *Striga* spp (witch weed) on millets
(c) Complete stem parasite - *Cuscuta* (dodder) in lucerne & berseem
(d) Partial stem parasite - *Loranthus* in fruit crops

39. Factors affecting P fixation in soils are -
1. Clay minerals
2. Hydrous metal oxides of iron and aluminum
3. Calcium carbonate
4. Air

Select the correct answer using the codes given below:
(a) 1 and 3
(b) 1, 2, 3 and 4
(c) 1, 2 and 4
(d) 1, 2 and 3

40. The different forms of shifting cultivation are -
1. Slash-and-burn type of shifting cultivation
2. The chitemene system
3. The cover system
4. Cultivation cycle practiced in the Orinoco floodplain

Select the correct answer using the codes given below:
(a) 1 and 3
(b) 1, 2, 3 and 4
(c) 1, 2 and 4
(d) 1, 3 and 4

41. From the following statements about phosphorus deficiency, identify the correct one: -
(a) In general, plants having less than 0.01 % phosphorus are designated as P-deficient.
(b) In general, plants having less than 0.001 % phosphorus are designated as P-deficient.
(c) In general, plants having less than 1 .0% phosphorus are designated as P-deficient.
(d) In general, plants having less than 0.1 % phosphorus are designated as P-deficient.

42. Method(s) to reduce P fixation in soil is/are -
    1. Certain mycorrhizal fungi known as VAM colonize plant roots and through this association help the plant to absorb more P.
    2. P solubilizing bacteria like *Bacillus megatherium* and *Pseudomonas striatus*
    3. *Aspergillus awamori* are reported to enhance the availability of fixed P.

    Select the correct answer using the codes given below:
    (a) 1 and 3
    (b) 1, 2 and 3
    (c) 1 and 2
    (d) 1 only

43. The following are the functions of phosphorus in plant system
    1. Constituent of nucleoproteins, phytins and phospholipids.
    2. Essential constituent of number of enzymes -important in energy transfer.
    3. Strengthens the straw and decreases lodging.
    4. Brings about late maturity.

    Select the correct answer using the codes given below:
    (a) 1 and 3
    (b) 1, 2, 3 and 4
    (c) 1, 2 and 4
    (d) 1, 2 and 3

44. K is absorbed by the plant as K+. Its function(s) is/are -
    1. It regulates the opening and closing of stomata.
    2. Plays a major role in transport of water and nutrients throughout the plant in xylem.
    3. It improves drought tolerance.
    4. Imparts disease resistance.

    Select the correct answer using the codes given below:
    (a) 1 and 3
    (b) 1, 2, 3 and 4
    (c) 4 Only
    (d) 2 and 3

45. *Avena fatua* (wild oats) tends to grow to the height of winter grains and adjusts its ripening period to the crop over a wide varietal range. This type of mimicry is called -
    (a) Phenotypic mimicry
    (b) Genotypic mimicry
    (c) Varietal mimicry
    (d) Traditional mimicry

46. Which of these are potassium deficiency symptoms in plants?
    1. Potassium deficiency does not manifest immediately in the form of visible symptoms.
    2. First growth rate decreases and later deficiency symptoms appear.
    3. Deficiency symptoms first develop on the older leaves
    4. Chlorosis along the margins followed by scorching and browning of tips of newer leaves

    Select the correct answer using the codes given below:
    (a) 1 and 3
    (b) 1, 2, 3 and 4
    (c) 1, 2 and 4
    (d) 1, 2 and 3

47. Select the correct statement(s) about the classification of irrigation water based on Electrical Conductivity:

    1. C1 – Low salinity water, EC < 250 m mho/cm. This water can be used for most crops
    2. C2 – Medium salinity water, EC ranges between 250 – 750 m mho/cm. Can be used with moderate leaching.
    3. C3 – High salinity water, EC between 750 to 2250 m mho/cm. This water cannot be used on soil with restricted drainage.
    4. C4 – Very high salinity water, EC > 2250 m mho /cm. Not suitable for irrigation.

    Select the correct answer using the codes given below:
    (a) 2 and 3
    (b) 1, 2, 3 and 4
    (c) 3 Only
    (d) 2 and 4

48. Which of the following measures should be adopted for the use of saline water?
    1. Selection of salt tolerant crops and varieties.
    2. Deep ploughing to break the hard pan of salts if any.
    3. Dhaincha as a green manuring crop improves physical properties of the soil.
    4. Fertilizers should be applied less than the normal rate of their application.

    Select the correct answer using the codes given below:
    (a) 1 and 3
    (b) 1, 2, 3 and 4
    (c) 1, 2 and 4
    (d) 1, 2 and 3

49. Which of the following statements on "*Mera Gaon Mera Gaurav*' is true?
    (a) It is an initiative of ICMR
    (b) It was launched in 2015
    (c) KVK and ATMA are involved for its implementation
    (d) It was launched to promote direct interface between scientists with farmers to hasten 'Lab to Land' process

50. Which of the following properties of clay soil is/are correct?
    1. Clay fraction is less than 0.0002 mm in size and forms the decisive fraction of the soil
    2. Clay particles are characteristically plate like or needle like in shape.
    3. They are very plastic like and sticky in moist condition; and become hard and cloddy when dry.
    4. High tenacity of clay makes the cultivation difficult.

    Select the correct answer using the codes given below:
    (a) 1, 2 and 3
    (b) 2, 3 and 4
    (c) 3 Only
    (d) 2 and 4

PART - II
(Short Answer-type Questions)

Instructions for Questions 51 to 63:

- ***Write the answers in short for any 10 (TEN)out of the thirteen questions.***
- ***Each question carries 5 marks.*** ***[5x10=50]***

51. Enlist the principles of extension education and explain any two principles.

52. What is market segmentation? How do companies pitch for different segments of market?

53. What is cooperation? Discuss the maxims of cooperation.

54. How can agricultural production be improved by applying Remote Sensing (RS)? Explain.

55. Write a note on capacity building of extension personnel and the various types of training models.

56. Enumerate the global initiatives for mitigating climate change.

57. Explain nitrogen-use efficiency in submerged rice soils.

58. What are the training methodologies available for dissemination of the information to farmers? Explain one of them with a suitable chart.

59. What are the remedies for reclamation of acidic soil and sodic soil?

60. Explain the cultural and biological methods available for weed management.

61. Write about the role of market intelligence on the Agricultural Economy.

62. What are the technologies for stabilizing agriculture production in rainfed areas? Explain.

63. Write a note on the quality parameters required for irrigation water used to crop plants.

PART - III
(Long Answer-type Questions)

Instructions for Questions 64 to 71:

- ***Answer any 5 (FIVE) out of the eight questions.***
- ***Each question carries 10 marks.*** ***[10x5=50]***

64. Discuss the salient features of KVK with its organizational structure. Write the merits and demerits of KVK.

65. Define Agroecology. Explain with suitable examples the effects on agroecology due to the modern crop production system as compared to ancient agricultural practices.

66. Critically analyze the employment generation programmes of Government of India in the field of agricultural development.

67. 'Utilization of natural resources is the best way for sustainable crop production'- Explain with suitable examples.

68. 'Introduction of high-yielding and short-duration varieties of seeds has increased crop production in India.' Explain this with suitable examples.

69. What are millets? Describe the package of practices for production of Sorghum.

70. Write a note on the quality parameters required for irrigation water used for crop plants? Name ten irrigation projects in India used for agricultural purpose (name only one irrigation project from one state).

71. Describe in detail the projects or measures taken up by the Government of India for Soil Conservation and Integrated Watershed Management.

PART - IV
(Essay-type Questions)

Instructions for Questions 72 to 75:

- ***Answer any 2 (TWO) out of the four questions.***
- ***Each question carries 25 marks.*** ***[25x2= 50]***

72. Discuss the different instruments of farm price policies in India. Comment in detail on any one of the recent price policies.

73. Compare and contrast organic farming with precision farming. Give a detail account of the organic certification process required for organic products in India.

74. Differentiate between farm planning and farm budgeting. Classify farm budgeting techniques and discuss the different steps involved in farm budgeting.

75. Discuss in detail the key features of AMUL model of Cooperatives in India. Why could the success of AMUL model not be replicated with similar success in other parts of India? Explain with suitable examples.