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Answers may be given either in English or in Bengali but all answers must be in one and the same language.

GROUP-A

Answer any three Questions :

1. i) Discuss on SRI. Mention the differences between SRI and conventional cultivation method of transplanted rice. 20
- ii) Describe in details about recommended management practices of jute crop. 20
2. i) Define "Weeds". 5
- ii) State the characteristics of Weeds. 5
- iii) Discuss in details about Weed management practices in Organic farming. 30
3. i) Define 'soil'. 5
- ii) Distinguish between soil fertility and soil productivity. 8
- iii) Discuss on modern concept of soil fertility. 7
- iv) Describe different methods of soil conservation. 20
4. i) What do you mean by 'essential plant nutrients' ? Classify and enlist essential plant nutrients. 10
- ii) Mention the important functions and commonly used sources of following plant nutrients :
N, P, S and Mo 20
- iii) Narrate the important features of INM. 10
5. Write in brief on any four : 10x4
 - a) Concentrated organic manure;
 - b) Biofertilizers;
 - c) Vermicompost;
 - d) Drip irrigation;
 - e) Strategies for improvement of fodder cultivation;
 - f) Green manure crops and green manuring.
6. i) Write in details on sugarcane cultivation in W.B. with special reference to — varieties, soil, tillage practices, sowing parameters, intercultural operations, nutrient management, plant protection measures, harvesting and yield. 25
- ii) Describe the crop management practices of rabi maize. 15

Answer any two Questions :

- a) Crop insurance;
- b) Jute retting;
- c) Farm forestry;
- d) Soil solarisation;
- e) Methods of fertilizer application;
- f) Reduced tillage;
- g) SHG in agriculture;
- h) Reclamation of problem soils.

8. i) State the differences (with examples) between 'legumes' and 'pulses'.

ii) What do you mean by paira crop ? State the importance of paira cropping.

iii) Pulses are considered as "Climate smart crops" --- Explain the statement.

9. i) What is agroforestry ? Describe the benefits of agroforestry.

ii) What do you mean by MPTs ? State the characteristics of MPTs suitable for agroforestry.

iii) Narrate the following land use systems :

- a) Alley cropping;
- b) Shifting cultivation;
- c) Wing-breaks;
- d) Taungya system.

10. Write in brief on any four :

- a) Cold storage and warehouse;
- b) Farm planning;
- c) Dryland farming;
- d) K V K;
- e) Afforestation;
- f) Water harvesting.

10x4

1. 凡在本市行政区域内从事经营活动的个体工商户、企业法人、其他经济组织（以下统称“经营者”），均应当遵守本规定。

2018
AGRICULTURE - PAPER-II

Time Allowed : 3 Hours

Full Marks : 200

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ANSWER ANY FIVE QUESTIONS.

1. a) Write down types of photosynthesis.
b) Write down the photosynthetic Pigments.
c) Discuss the characteristics of chlorophyll. 10+10+20
2. a) Write down the cultivation of Tea with special reference to climate, cultivation, training and pruning, plucking and Tea manufacturing.
b) Discuss in details cultivation of Coffee. 20+20
3. a) Ennumerate the cultivation of Banana mentioning varieties, propagation, manuring, after care, irrigation and harvesting.
b) Discuss in details cultivation of mango with reference to varieties, after care, harvesting and marketing. 20+20
4. a) Discuss the importance of vegetables.
b) Write down the types of vegetable garden.
c) Discuss the classification of vegetables. 10+15+15
5. a) Discuss the Importance of medicinal plants.
b) Write down the cultivation of Isobgol. 20+20
6. a) Write down the Importance of Spices in India.
b) Discuss in details cultivation of Pepper (Improved method). 20+20
7. a) Write down definition, nature and causes of diseases of crops.
b) Discuss about Seed-borne, Soil borne and air borne diseases of crops.
c) What do you mean by fungicides ? Write in brief different types of fungicides used for control of diseases of crops. 15+15+10
8. a) Critically discuss principles of Insect and Pest Control.
b) Write down the selection of proper methods for controlling different Pests. 20+20



2019

AGRICULTURE

PAPER-I

Time Allowed—3 Hours

Full Marks—200

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The figures in the margin indicate marks for each question.

Group A

Answer any three questions.

1. (a) What is greenhouse effects?
 (b) Describe in brief about global warming and its effects on crop production.
 (c) State the use of Remote Sensing technology in agriculture. 10+20+10=40

2. (a) What is the difference between soil fertility and productivity?
 (b) What are the major soil nutrient as essential elements in plant growth?
 (c) What to you know about micronutrients and its necessity in plant growth?
 (d) What do you know about the Law of Minimum?
 (e) Describe the amelioration of acid soils in different parts of this state. 8+10+10+4+8=40

3. (a) What are the different soil forming factors? Describe in brief.
 (b) Discuss in details on the methods on soil and water conservation.
 (c) Describe the role of Agro Forestry in such conservation methods. 8+20+12=40

4. Write in brief on **any five**: 8×5=40
 - (a) Precision agriculture
 - (b) Rainwater harvesting
 - (c) Jute rating
 - (d) Vermi compost

- (e) Farm planning and budgeting
 - (f) Bio-fertilizers
 - (g) Organic farming
5. (a) Describe in details package and practices of rice cultivation during kharif season.
- (b) Write down scope of growing rabi maize under West Bengal situation. 20+20=40

Group B

Answer any two questions.

6. (a) What are the different types of problem soils in this State? State the methods of reclamation of this types of problem soils.
- (b) Describe the major physiological role of N, P, K for plant nutrition and their deficiency symptoms. 20+20=40
7. (a) Describe in detail on the role of KVK in technology transfer system.
- (b) Discuss in details about weed management practices in organic farming.
- (c) What do you know about sustainable agriculture? 10+20+10=40
8. Write short notes on **any five**: 8×5=40
- (a) Crop insurance
 - (b) Dry land farming
 - (c) Soil erosion and its control
 - (d) Green manure crops
 - (e) Reinforcing manures
 - (f) Field capacity and permanent wilting point
 - (g) Sheet Erosion
 - (h) Effective rainfall and its measurement
9. (a) What do you know about rainfed agriculture? What is the differences between rainfed agriculture and dry land farming?
- (b) Write down about the rainwater harvesting and recharge of groundwater.
- (c) What do you know about shifting cultivation? 20+10+10=40
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2019

AGRICULTURE

PAPER-II

Time Allowed — 3 Hours

Full Marks — 200

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Answer any five questions.

1. (a) Why meiotic cell division is required? Briefly state about different phases of meiotic cell division.
(b) Clearly state about molecular basis of crossing over.
(c) A male person is having one pair of homologous chromosomes — A_1A_2 along with one additional chromosome 'B' without pairing. What will be chromosomal constitution of each of the four gametes produced after one meiotic division? (5+20)+5+10=40
2. (a) Classify different types of polyploids with its chromosomal formulae and genetical significance.
(b) Schematically represent the relation between flower structures of plants and its breeding behaviour.
(c) What is backcross breeding? State its genetic basis. Clearly discuss on the procedures followed in backcross breeding. 10+10+20=40
3. (a) How male sterility differs from self incompatibility? Classify different types of male sterility with its practical utility.
(b) Discuss about 'Gametophytic system' of self incompatibility. How it could be differentiated from 'Sporophytic system'?
(c) Briefly enumerate different types of hybrid seed production in maize. (3+12)+(10+5)+10=40
4. (a) What is meant by quality seed? Discuss about probable reasons for quality deterioration during seed production system with its prevention.
(b) Clearly describe the breeder seed production procedure of self pollinated crops with special reference to a particular crop.

- (c) How seed production in cross-pollinated crops differs from that of vegetatively propagated crops?
- (d) Outline the most important aspects of hybrid rice seed production. $(2+10)+12+6+10=40$
5. (a) Discuss stepwise about the propagation procedure followed for different citrus species.
- (b) Compare the seed production technology of cabbage and cauliflower.
- (c) Write in brief about medicinal uses, cultivation and propagation methods for 'Ashwagandha'.
 $15+15+10=40$
6. (a) What are the causes of insect pests outbreaks in agro ecosystem? What is pesticide residue?
- (b) Briefly discuss about the major criteria for implementing 'IPM' technology in crop cultivation.
- (c) What are the major insect pests of banana crops? Mention nature and symptoms of damage caused by them and specify rational management practices against them. $15+10+15=40$
7. (a) Briefly discuss the principles of disease management in crops.
- (b) Describe in detail on symptoms, epidemiology and management of major diseases of cruciferous vegetables.
- (c) Write a short account on insect transmitted viral diseases of some horticultural crops.
 $15+15+10=40$
8. (a) Define protected cultivation of horticultural crops and mention its advantages and limitations.
- (b) Narrate briefly about the protected cultivation practices of any cut flower.
- (c) Discuss about national programmes and initiatives related to nutrition and food security in India.
 $15+15+10=40$
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2021
AGRICULTURE
PAPER-I

Time Allowed — 3 Hours

Full Marks — 200

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*Answers may be given either in **English** or in **Bengali** but all answers must be in one and same language.*

Group-A

Answer any three questions.

1. (a) What do you mean by physical features and climate? 10
 (b) Discuss in short crop yield formulation. 10
 (c) Write in short long range forecasts of weather and crop yields. 10
 (d) Write down the agro-climatic zones in India. 10
2. (a) What do you mean by cropping pattern? 10
 (b) Discuss in brief the present cropping patterns. 10
 (c) Write down the rice based cropping in West Bengal. 10
 (d) Discuss about Mixed cropping in India. 10
3. (a) What do you mean by fibre crops? Write down the names of fibre crops cultivated in India. 20
 Write down the cultivation of improved methods jute cultivation. What are the problems faced by the farmers for jute retting? 20
 (b) Describe different methods cultivation of improved yield varieties of rice by farmers of West Bengal. 20
4. (a) Describe in brief the natural powers of weeds. 10
 (b) Discuss in details types of weeds found in the field. 15
 (c) Describe in brief crop-weed competition. 15
5. (a) Define soil. 5
 (b) Describe the process and factors of soil formation. 20
 (c) Discuss in details problems of soil. 15

Group-B

Answer any two questions.

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| 6. (a) Critically discuss about plant nutrition and soil plant system. | 20 |
| (b) Discuss plant nutrients and their function. | 20 |
| 7. (a) Critically discuss in details importance and role of Agriculture-extension for rural development. | 20 |
| (b) Discuss role of Krishi Vigyan Kendra in transfer of technology. | 20 |
| 8. (a) Critically discuss functions of agricultural marketing. | 20 |
| (b) Critically discuss the marketing improvements for getting proper market price of the farmers. | 20 |
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2021
AGRICULTURE
PAPER-II

Time Allowed — 3 Hours

Full Marks — 200

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Group-A

Answer any three questions.

1. (a) What do you mean by 'good quality seed'? 5
 (b) Describe the seed production technology of rice. 20
 (c) Write down the normal seed certification procedure. 15
2. (a) State Mendel's laws of heredity. 10
 (b) What do you mean by polyploidy? 5
 (c) Discuss in details about polyploids in agriculture. 25
3. (a) Distinguish between plant growth and development. 5
 (b) Discuss on plant growth factors and their roles. 10
 (c) Define plant growth regulator (PGR). Give the classification of PGR. Mention the uses of Auxin, Gibberellins and Ethylene in agriculture. 25
4. Write in brief on *any two*: 20×2=40
 (a) Cultivation of betelvine crop under closed system (within *boroj*)
 (b) IPM for vegetable crops
 (c) Cultivation of tea in West Bengal
 (d) Recommended cultivation practices of *marigold*
5. Write in details about the cultivation practices of *Mango* and *Guava* with special reference to:
 soil, land preparation, sowing parameters, varieties, intercultural operations, nutrient management,
 plant protection measures, harvesting and yield. 20+20=40

Group-BAnswer *any two* questions.6. Write short notes on *any five*:

8×5=40

- (a) Mutation breeding in plants
- (b) Plant cell structure and functions
- (c) GM crops
- (d) Role of light as a biological agent
- (e) Export of agricultural commodities
- (f) Role of osmosis in plant life
- (g) Important medicinal plants of West Bengal and their uses
- (h) Uses of spices and condiments

7. (a) Compare C₃, C₄ and CAM plants.

12

(b) Classify environmental stresses to which plants may be subjected during their growth periods.

8

(c) Describe the effects of water deficit on growth and metabolism of plants.

20

8. (a) What is landscaping? Describe the process and steps of landscaping.

20

(b) Discuss on protected cultivation of horticultural crops.

20

9. Write in brief on *any four*:

10×4=40

- (a) Critical day length
 - (b) Antitranspirants
 - (c) Hill reaction
 - (d) Storage of crop seeds
 - (e) Plant respiration
 - (f) Nutritional security
 - (g) Plant propagation
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2021
AGRICULTURE
PAPER-I

Time Allowed — 3 Hours

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Group-A

Answer any three questions.

40×3=120

1. (a) What is agro ecology and what are the agro-ecological factors? 10
 (b) Describe the role of climate and weather on crop production. 20
 (c) Write in brief precision farming. 10
2. (a) What do you mean by the greenhouse effect? 10
 (b) What are global warming and its impact on agriculture? 20
 (c) Write in brief the application of remote sensing in agriculture. 10
3. (a) Define cropping pattern and cropping sequence. 10
 (b) Describe the objectives, types and impacts of cropping patterns on High Yielding Varieties. 10
 (c) Write in brief recent changes of cropping patterns in the light of global warming and climate change. 20
4. (a) What do you mean by agricultural extension? 5
 (b) Write down the importance and role of agricultural extension in promoting and sustaining rural development. 15
 (c) Describe the principles and methods of agricultural extension. 20
5. (a) What do you mean by market-led extension? 5
 (b) Describe agricultural marketing with an emphasis on supply chain, pricing and market intelligence. 15
 (c) Write in brief the role of cold storage in the economy of agriculture. 20

Group-B

Answer *any two* questions.

40×2=80

6. (a) Critically discuss the role and function of Krishi Vigyan Kendra in the Indian context. 20
(b) Describe the role of Self Help Group in agriculture with special reference to Womens' Empowerment. 20
 7. (a) What is dryland farming and what is the different limiting factor in dryland farming? 20
(b) What do you mean by water use efficiency in relation to crop production? Write in brief scheduling irrigation. 20
 8. (a) Define soil and explain the factors of soil formation. Write in brief different problems of soil and their reclamations. 20
(b) What do you mean by plant nutrition? Describe the role of essential elements in plant nutrition. 20
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2021

AGRICULTURE

PAPER-II

Time Allowed — 3 Hours

Full Marks — 200

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Group-A

Answer any three questions.

1. (a) Write down the role of genetics in crop improvement. 10
 (b) Write in brief cell structures and functions. Illustrate chromosome structure. 20
 (c) Describe the law of heredity and application in crop improvement research. 10
2. (a) Write in brief the history of plant breeding and its contribution in Indian agriculture. 10
 (b) Elaborate on the concept of crop genetics resources and conservation. 20
 (c) Describe different breeding methods. 10
3. (a) What are molecular markers and DNA Finger Print? Elaborate with suitable examples. 10
 (b) What do you mean by GM Crops? Critically examine the role of GM Crops in agricultural development. 10
 (c) What do you mean by Photoperiodism and stress physiology? Explain in brief. 20
4. (a) What is a quality seed and what is seed testing? 10
 (b) Write in brief the different stages of the seed certification process. 10
 (c) What factors should a farmer consider while he is going to produce seeds on his own farm? 20
5. (a) What is Landscaping and what way it is related to Good Agricultural Practices? 20
 (b) Write down the principles and features of Landscaping. 10
 (c) What do you mean by protected cultivation and what are its advantages? 10

Group-B

Answer *any two* questions.

6. Write short notes on *any five*: 8×5=40
- (a) Export of agricultural products
 - (b) Post-harvest technology
 - (c) Medicinal and aromatic crops
 - (d) Heterosis vigour
 - (e) Somatic hybridization
 - (f) Plantation and spices
 - (g) Plant growth substances
7. (a) Elaborate the issues of food and nutrition security in India. 20
- (b) Explain the Selfing and Crossing techniques with examples. 10
- (c) What do you mean by IPM? Elaborate with examples. 10
8. (a) What is an ideal orchard? What are the horticultural crops suitable for orchards with commercial purposes at the farm level? 20
- (b) Describe cultivation practices of any two horticultural crops that are commercially successful and popular amongst farmers. 20
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2022

AGRICULTURE

PAPER-I

Time Allowed — 3 Hours

Full Marks — 200

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Group-A

Answer any three questions.

1. Define intercropping as compared to pure cropping. State the advantages of intercropping. What is suitable cropping system? State the soil and water management in cropping system.
10+10+10+10=40
2. (a) Describe the factors and process of soil formation.
(b) Describe in details, about the problem of soils and their management. (10+10)+20=40
3. (a) Describe different methods of cultivation of improved varieties of rice.
(b) Discuss about macro-nutrients and their functions. 20+20=40
4. Differentiate between a weed and crop. Discuss the special characteristics of weed. Classify weeds based on ontogeny, origin and morphology with example. Discuss weed management in transplanted rice and potato crop. 10+10+10+10=40
5. (a) Write in brief, the factors affecting water use efficiency.
(b) Mention the strategies that increase water use efficiency.
(c) Give a schematic diagram of methods of irrigation.
(d) Mention the different parameter which are considered for judging the suitability of water for irrigation. 10+10+10+10=40
6. (a) "All weeds are plants but all plants are not weeds." — Discuss with suitable example.
(b) Discuss why it is easier to control weeds in winter and summer rice than Autumn rice.
(c) State why preventive methods of weeds management is always better than control.
(d) Discuss why chemical method of weed management is gaining importance day by day than other methods of weed management. 10+10+10+10=40

Group-B

Answer any two questions.

7. Write notes on any four : 10×4=40
 - (a) Global warming
 - (b) Precision farming
 - (c) Geographic Information System (GIS)

- (d) Acid soil
 - (e) Dryland farming
 - (f) Biofertilizers
8. (a) Describe the principle and methods of agriculture extension.
(b) Describe the role of Krishi Vigyan Kendra in transfer of technology for rural development.
20+20=40
9. (a) What is the difference between fertility and productivity?
(b) Write note on Acid sulphate soil.
(c) Write notes on different agro climatic zones of India.
(d) Discuss about mixed cropping in India.
5+5+20+10=40
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2022

AGRICULTURE

PAPER-II

Time Allowed — 3 Hours

Full Marks — 200

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Group-A

Answer any three questions.

1. (a) Membrane play an important role in various function of living plant cell. Explain it with diagram and example.
(b) Discuss in details about photosynthesis of the plant. 20+20=40
2. Write notes on *any five* : 8×5=40
 - (a) Cell
 - (b) Cell Membrane
 - (c) Mitochondria
 - (d) Chloroplast
 - (e) Synaptonemal Complex
 - (f) Cell theory
 - (g) Ribosome
 - (h) Vacuole
3. (a) Define seed.
(b) Briefly describe the role of quality of seed in crop production.
(c) Discuss about various seed quality characters.
(d) Describe in brief about seed certification. 5+15+10+10=40
4. (a) What is allopolyploid? How does it occur in nature and how can you induce allopolyploid? Discuss the role of allopolyploid in plant evolution and limitation of it in crop improvement. 2+3+3+12=20
(b) What are the common aneuploids for locating genes of chromosome? Give a brief description of the techniques using suitable diagram. 20
5. (a) What is TPS? What are the advantages of using TPS? How can TPS be grown in plain area? 2+6+12=20
(b) How do the seeds deteriorate? What are the symbols of deteriorated seeds? How it is possible to maintain genetic purity of seeds? What are the agronomic techniques adopted to maintain genetic purity of seeds? 5+5+5+5=20

6. Describe the standard method of cultivation of Mango with special reference to soil type, climatic condition, fertilizer requirements, irrigation and management practices. 40

Group-B

Answer *any two* questions.

7. Write short notes on *any five* :

- (a) GM crops
- (b) Important medicinal plants of West Bengal and their uses
- (c) Certified seeds
- (d) Pest Management
- (e) Indexing of tuber
- (f) Quarantine
- (g) Heritability

8. Write the variety of tube-rose in the plains of West Bengal. Write their cultivation with special reference to land preparation, fertilizer requirement, inter cultural operation, irrigation and stick management. 5+10+10+10+5=40

9. Write in brief (*any four*) :

- (a) Hill reaction
 - (b) Nutritional Security
 - (c) Role of light as a biological agent
 - (d) Tripple fusion
 - (e) Neurospora
 - (f) Post-harvest technology
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