

AGRICULTURE—PAPER-I

Time – Three hours

Full Marks – 100

Answer to **Question No.1** i.e. **MCQ** type questions under Section-A must be written in English only. Answers to other questions must be written either in English or in Bengali. It must not be answered partly in English and partly in Bengali.

This instruction should be followed scrupulously.

The figures in the margin indicate full marks for the questions.

Candidates are required to give their answers in their own words as far as practicable.

SECTION – A

Answer *all* questions.

1. Select the single best answer and write it in the answer-script putting option either (i) or (ii) or (iii) and (iv) as applicable. 20×1=20

Example : IARI is located at

- | | |
|-----------------|----------------|
| (i) Bhopal | (ii) Bengaluru |
| (iii) New Delhi | (iv) Hyderabad |

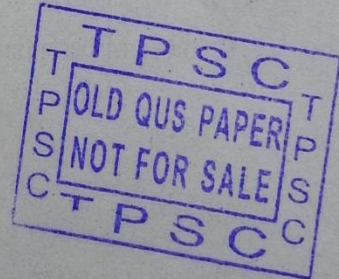
Answer : (iii) New Delhi

- (a) Who is considered as the father of tillage ?

- | | |
|----------------------|--------------------------|
| (i) Robert Hook | (ii) Jethro Tull |
| (iii) Niel Armstrong | (iv) Gregor Johan Mendel |

- (b) The term 'Agronomy' is derived from _____ language.

- | | |
|--------------|-------------|
| (i) English | (ii) German |
| (iii) French | (iv) Greek |



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(c) First cultivated crops in the world are

- (i) Wheat and barley (ii) Wheat and groundnut
(iii) Wheat and lentil (iv) Wheat and sugarcane

(d) The colourless, tasteless, odourless mixture of gases that surrounds the earth is called as

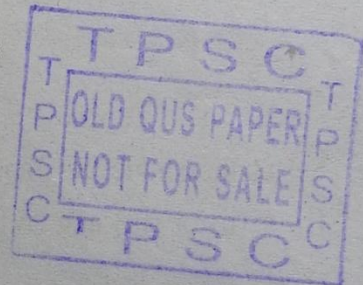
- (i) Climate (ii) Weather
(iii) Atmosphere (iv) Wind

(e) Blue revolution is related to

- (i) Olericulture (ii) Sericulture
(iii) Floriculture (iv) Pisciculture

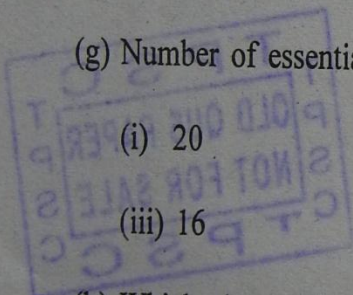
(f) Average annual rainfall in India is

- (i) 1190 mm (ii) 1400 mm
(iii) 2100 mm (iv) 750 mm



(g) Number of essential elements required for plant growth is

- (i) 20 (ii) 14
(iii) 16 (iv) 12



(h) Which element is more prone to different types of losses ?

- (i) Phosphorous (ii) Nitrogen
(iii) Zinc (iv) Potassium

(i) Phosphorous content in the fertilizer DAP is

- (i) 46% (ii) 18%
(iii) 16% (iv) 60%

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- (j) Crop logging concept was first tried in
- (i) Cotton (ii) Maize
(iii) Red gram (iv) Sugarcane
- (k) Water use efficiency is the highest in ——— irrigation method.
- (i) Sprinkler (ii) Drip
(iii) Check basin (iv) Ridges and furrows
- (l) Khaira disease in rice is caused by
- (i) Bacteria (ii) Virus
(iii) Nutrient deficiency (iv) Nutrient toxicity
- (m) ——— species of *Triticum* is good for making semai, suji, macaroni, etc.
- (i) *T. aestivum* (ii) *T. durum*
(iii) *T. dicoccum* (iv) None of the above
- (n) Botanical name of pop corn is
- (i) *Zea mays indurata* (ii) *Zea mays indentata*
(iii) *Zea mays saccharata* (iv) *Zea mays everta*
- (o) Which cropping system is having the largest area in India ?
- (i) Rice-Rice-Rice (ii) Wheat-Rice
(iii) Rice-Wheat (iv) Rice-Potato
- (p) Cropping intensity of Tripura is
- (i) 139% (ii) 193%
(iii) 112% (iv) 211%

(q) Headquarters of Central Food Technological Research Institute (CFTRI) is located at

- (i) Hyderabad (ii) New Delhi
(iii) Bengaluru (iv) Mysore

(r) In a map, a line joining areas receiving the same amount of rainfall is referred to as

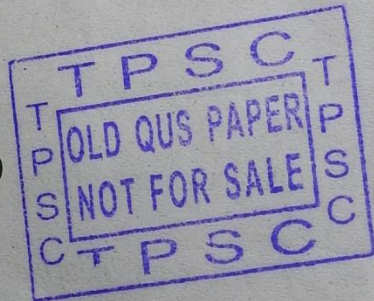
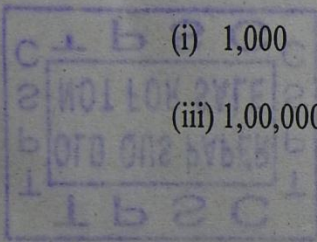
- (i) Isobar (ii) Isohyet
(iii) Isotherm (iv) None of the above

(s) Headquarters of ———, a consortium partner of the CGIAR is located in India.

- (i) ICRISAT (ii) IRRI
(iii) FAO (iv) CIMMYT

(t) 1 molecule of chlorine from CFC can remove ——— molecules of ozone from ozonosphere.

- (i) 1,000 (ii) 10,000
(iii) 1,00,000 (iv) 10,00,000



SECTION-B

Answer any six questions.

6×5=30

2. Describe in brief about the internal and external factors of crop production. 5
3. Define soil. What is weathering? What are the factors affecting soil genesis? 1+1+3=5
4. What is Integrated Nutrient Management? Describe in short about the role of biofertilisers and role of bulky organic manures in INM. 1+2+2=5
5. Define scheduling of irrigation. Enlist different approaches for scheduling of irrigation. Write in brief about the pressurized method of irrigation. 1+2+2=5

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(4)

6. List out the present problems of agricultural marketing in Tripura. How co-operative societies can play an important role in upliftment of rural economy in Tripura? 2+3=5
7. Write in short about importance of Agroforestry. List out the commonly used herbicides in Tripura. 3+2=5
8. What are the prime causes of global warming? How it is related to crop production and allied activities? 3+2=5
9. What are different types of weather forecasting required in agriculture? Briefly write about importance of conserving biodiversity in agriculture. 3+2=5

SECTION - C

Answer any *five* questions.

5×10=50

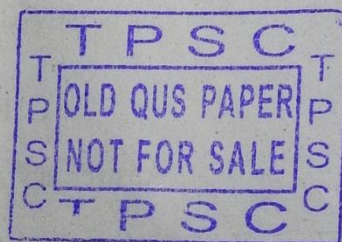
10. Enlist the elements of weather. Write a short note about South West Monsoon and its role in Indian Agriculture. Write in short about the agro-ecological zones of India. 3+3+4=10
11. What are different types of environmental pollution? Give a brief account of soil and water pollution and their impact in crop cultivation. Give your own opinion about the strategies to be adopted to mitigate this type of pollution. 1+5+4=10
12. Differentiate between soil fertility and soil productivity. Write in short about the classification of essential elements for plant growth and development. What are the functions of nitrogen and phosphorous in crop life cycle? 2+4+4=10
13. What is soil erosion? What are different forms of soil erosion? Describe in brief about the measures to conserve top soil. What do you know about the Integrated Watershed Management Project (IWMP) in Tripura? 1+3+4+2=10
14. What are different types of cropping system? Write in brief about the principles of crop rotation. Differentiate between traditional low-land paddy cultivation and system of rice intensification. 3+3+4=10
15. Differentiate between sustainable agriculture and modern agriculture. Enlist different approaches towards sustainable agriculture. At present, what are the constraints of organic farming in India? 3+4+3=10

4×2½=10

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16. Write short notes on any *four* of the following :

- (a) Function of Krishi Vigyan Kendra
- (b) Role of women in agriculture
- (c) Agricultural implements
- (d) Integrated Farming System
- (e) Role of computer and mobile phone in dissemination of agricultural technologies
- (f) Marketing and pricing of fertilizer
- (g) Shifting cultivation in Tripura.



AGRICULTURE—PAPER-II

Time – Three hours

Full Marks – 100

Answer to Question No.1 i.e. MCQ type questions under Section-A must be written in English only. Answers to other questions must be written either in English or in Bengali. It must not be answered partly in English and partly in Bengali.

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SECTION – A

Answer all questions.

1. Each question in this section contains four choices (i) or (ii) or (iii) and (iv) as answers. Choose the correct answer from the options and write in your answer-script.

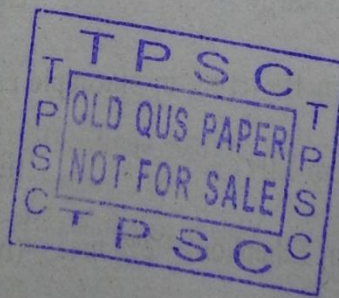
20×1=20

Example :

Question : Green revolution of India relates to higher yield in

- (i) Wheat and Mustard
- (ii) Wheat and Barley
- (iii) Wheat and Rice
- (iv) None of these

Answer : (i) Wheat and Rice



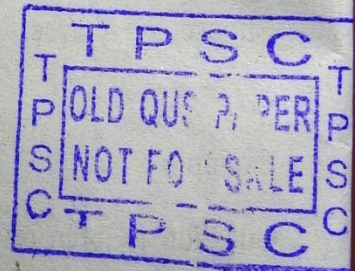
(a) The first artificial Hybrid was made by

- (i) Koelreuter
- (ii) Mendel
- (iii) Thomas Fairchild
- (iv) Beal

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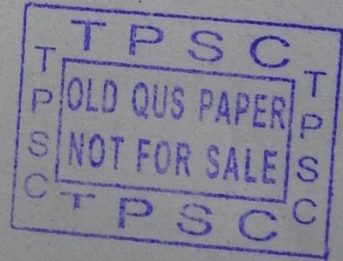
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- (b) An example of a heterozygous but homogenous population is
- (i) Pure line
 - (ii) Open pollinated variety
 - (iii) Hybrid variety
 - (iv) Synthetic variety
- (c) Cytoplasmic male sterility is best suited for hybrid seed production in
- (i) Self pollinated crops
 - (ii) Cross pollinated crops
 - (iii) Vegetatively propagated crops
 - (iv) All of the above
- (d) Test cross ratio in case of duplicate gene action will be
- (i) 1 : 1
 - (ii) 1 : 2
 - (iii) 1 : 3
 - (iv) 3 : 1
- (e) AFI Plant with the genetic constitution AaBbccDd is test crossed with aabbccdd, there will be
- (i) 10 genotypes
 - (ii) 8 genotypes
 - (iii) 12 genotypes
 - (iv) 4 genotypes
- (f) Types of Apomixis present in citrus
- (i) Non Recurrent
 - (ii) Recurrent
 - (iii) Parthenocarpy
 - (iv) None of the above
- (g) The uniform flowering in pineapple can be induced by application of
- (i) 100 ppm MH
 - (ii) 50 ppm GA 3
 - (iii) 25 ppm Ethephon + 2% urea
 - (iv) 50 ppm paclobutrazol
- (h) Wax coating treatments enhances the shelf life of fruits because it blocks
- (i) Transpiration
 - (ii) Respiration
 - (iii) Ripening process
 - (iv) None of the above



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- (i) Generally seedless Watermelon is
- (i) Diploid (ii) Triploid
(iii) Tetraploid (iv) Hexaploid
- (j) Browning of cauliflower is due to
- (i) Boron deficiency (ii) Nitrogen deficiency
(iii) Boron toxicity (iv) Molybdenum deficiency
- (k) Select the disease(s) caused by MLO (Mycoplasma like organism)
- (i) Brinjal little leaf (ii) Rice yellow dwarf
(iii) Sesame Phyllody (iv) All of the above
- (l) White blisters of crucifers' is caused by pathogen —
- (i) *Pythium debarynan* (ii) *Albugo candida*
(iii) *Sclerospora sorghi* (iv) *Plasmopora viticola*
- (m) Effect of *Phytophthora palmivora* in Citrus can be identified by observing
- (i) Death of Shoot Tip (ii) Root Knot
(iii) Chlorosis (iv) Oozing of gum
- (n) The causal organism of bunt of rice is
- (i) *Urocystis tritici* (ii) *Tilletia foetida*
(iii) *Nevossia horrid* (iv) None of these
- (o) Early Blight of Potato produces
- (i) Conidia (ii) Telia
(iii) Uredia (iv) Acecia



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(p) Which insect has evolved resistance to Bt in open field population ?

- (i) Pink boll worm (ii) Diamond back moth
(iii) Spotted boll worm (iv) None of these

(q) Aphids and white flies are effectively controlled by

- (i) Fumigants (ii) Stomach poisons
(iii) Contact insecticides (iv) Systemic insecticides

(r) Yellow Mosaic Virus disease of Moong / Green gram spreads by

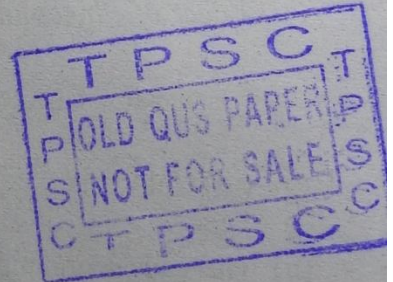
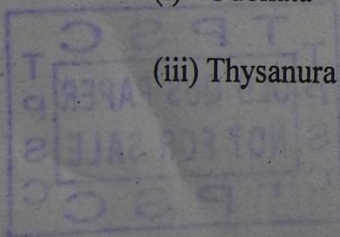
- (i) *Bemisia tabaci* (ii) *Aphis craccivora*
(iii) *Nephotettix virescens* (iv) *Amrasca biguttula*

(s) Stylets are present in the mouth parts of the following

- (i) Plant Bug (ii) Cockroach
(iii) Cotton Weevil (iv) Rhinoceros beetle

(t) Antenna is absent in

- (i) Odonata (ii) Protura
(iii) Thysanura (iv) Coleoptera



SECTION - B

Answer any six questions.

6×5=30

2. Define pruning and training. Write description on the different types of pruning and training in brief.
3. What is the importance of pollination in horticultural crops ? Describe role of pollinators on horticultural crops in increasing fruit production.

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4. Describe method of propagations of fruit plants. Discuss advantages and disadvantages of the sexual and asexual method of propagation.
 5. Detail the fungal and bacterial disease management of cabbage, cauliflower and Khol along with the scientific names of the causal organisms, symptoms, nature of damage and control measures in brief.
 6. Detail the pest management of Citrus along with the scientific names of the pests, symptoms and nature of damage in brief.
 7. Explain the significant differences between Mitosis and Meiosis.
 8. Describe complementary and supplementary gene interactions with suitable examples.
 9. What is the difference between IPM and BIPM? Write the scientific names of different category of BIPM agent, along with the targeted pests and diseases and their control measures.

SECTION - C

Answer any *five* questions.

5×10=50

10. Write short notes on any *five* of the following;

- (i) QTLs
- (ii) Augmented design
- (iii) RFLP
- (iv) GXE interaction
- (v) Plant breeders right and variety protection
- (vi) SSD
- (vii) Over dominance hypothesis
- (viii) Multi-lines
- (ix) Micro satellite markers
- (x) Metroglyph analysis

11. Discuss the various types of male sterility used in crop improvement. Also discuss the scope of two line systems for hybrid seed production. Briefly describe its achievement citing some examples.
12. Describe in brief the origin, soil, climate and nutritional requirement of potato and sweet potato. Discuss two important varieties of potato in each early, medium and late maturing groups with their special characters having potential for cultivation in Tripura.
13. What is an insect vector? Give the categories of vectors based on mode of transmission.
14. Mention any three important pests of mango along with the scientific name. Describe in brief the nature of damage caused by them and write on their management approach.
15. Explain the stepwise procedural details of rejuvenating an old and unproductive orchard of Litchi and Orange under Tripura condition.
16. Describe package of practices recommended for Elephant Foot Yam, Tapioca, Arrow root and Taro with reference to suitability under Tripura condition. Soil and climatic requirement of crop, varieties, nutrient management and irrigation requirement in respect to each of the crop has to be mentioned distinctly.

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