

BOOKLET NO.

TEST CODE : **AEB**

Afternoon

Questions: 100 marks Time : 2 hours
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On the answer-booklet write your Name, Registration Number, Test Code, Number of this booklet, etc., in the appropriate places.

ANSWER QUESTION 1 AND ANY FIVE FROM THE REST

ALL ROUGH WORK MUST BE DONE ON THE BOOKLET AND/OR ON
THE ANSWERSHEET. YOU ARE NOT ALLOWED
TO USE CALCULATOR.

STOP ! WAIT FOR THE SIGNAL TO START

AEB

Agricultural Science (Agronomy, Agricultural Chemistry and Soil Science)

Answer Question No.1 and any five from the rest.

Full marks 100

1. In an agricultural experiment 5 irrigation levels and 4 phosphorus levels are to be considered. Which design of experiment will be most appropriate in this context? Justify your choice. Provide the analysis of variance table with sources of the various effects for your chosen design.

[3+5+12]

2. What is LER? How is LER calculated? What are the differences between inter and mixed cropping? State the importance of cereal-legume intercropping.

[2+2+4+8]

3. Write the importance of soil water. Mention the different methods for the measurement of soil moisture. What are the factors that greatly influence soil colour? Write the significance of hue, value, chroma for interpretation of soil colour. How the pore space is influence by bulk density?

[2+4+4+4+2]

4. Differentiate between the following

- i) Soil moisture and water ii) Bulk density and particle density
- iii) Normality and molarity iv) P-fixation and N-fixation
- v) Symbiotic N-fixation and associative N-fixation
- vi) Compost and vermicompost vii) Organic carbon and organic matter
- viii) Soil texture and soil structure

[2 x 8]

5. State the criteria for essentiality of nutrients for plant? State the roles of Mo and B in crop nutrition. Classify phosphatic fertilizers.

[4+6+6]

6. Briefly explain any four of the following with appropriate equations if any:

- i) Relative Crop Growth Rate
- ii) Leaf Area Index
- iii) Moisture Availability Index
- iv) Curvilinear response in fertilizer experiments with different nitrogen doses
- v) Acid sulphate soil
- vi) Concentrated organic manure
- vii) Mixed fertilizer
- viii) Biofertilizer
- ix) Soil Series [4 x 4]

7. What are the different forms of soil water? What is available soil moisture? What is wilting point? State how soil moisture may be conserved for crops? [3+3+2+8]

8. Describe each of the following in details :

- i) Global warming
- ii) Carbon sequestration
- iii) Precision agriculture
- iv) Nitrogen mineralization [4 x4]

9. State the role of C:N ratio in organic matter decomposition. State the role of organic matter in soil fertility. State the factors governing soil fertility. What is vermiculture? What is fertilizer use efficiency? What is mineralization and what is immobilization? [2+4+4+2+2+2]

10. What is the dominant pulse crop in India? Write down its climatic requirements and rotations followed with this crop. Name five improved varieties of this crop. [2+10+4]

11. What is soil pH and how it is governing the availability of plant nutrients? What do you mean by buffering capacity of soil? What is the difference between active acidity and reserve acidity? How some fertilizers can increase soil acidity? Write down some direct and indirect benefits of liming [2+4+2+2+2+4]

12. Distinguish between any four of the following :

- a) Transpiration and Evaporation.
- b) Phytoclimate and Microclimate.
- c) Multiple cropping and Relay cropping
- d) Consumptive use of water and water requirement of crops
- e) Eluviation and Illuviation
- f) Laterization and Podzolisation.
- g) Soil survey and Soil testing.
- h) Pedology and Edhaphology

[4 x 4]

13. Write short note on any four of the following :

- a) Agronomic biofortification
- b) System of rice intensification
- c) Green manuring
- d) Conservation tillage
- e) Nitrification inhibitor
- f) Denitrification
- g) Chelates

[4 x 4]