**CSM – 7/16**

**Agriculture**

**Paper – II**

*Time : 3 hours*

*Full Marks : 300*

*The figures in the right-hand margin indicate marks.*

*Candidates should attempt Q. No. 1 from Section – A and Q. No. 5 from Section – B which are compulsory and* ***three*** *of the remaining questions, selecting at least* ***one*** *from each Section.*

## SECTION – A

1. Answer any **three** of the following in about **200** words each : 20×3 = 60

   (a) Discuss the importance of combining ability in plant breeding. Explain what is meant by recombinant breeding. Discuss the strategies adopted in breeding crop varieties for resistance to pests and diseases.

(b) Write notes on any **four** of the following :

(i) Cytoplasmic Inheritance

(ii) DNA and RNA and their importance in agriculture

(iii) Heterosis and its importance in crop improvement

(iv) Sex limited characters

(v) Euploids and Aneuploids

(c) Give a detailed account how the biotechnology can effectively be exploited in agriculture and narrate the success stories with suitable examples of important commercial crops.

(d) What is meant by chromosomal aberrations ? Give a brief account on gene structure and its function. How the cytoplasmic inheritance can be used in crop breeding ?

2. How best the seed viability would help in crop production ? Narrate the crops in which how the hybrid seeds are produced. Explain how the private seed sectors involve in crop seed production and its impact in agriculture. 60

3. (a) Distinguish between the following : 20×3 = 60

(i) Plant Growth Promoters and Plant Growth Regulators

(ii) Water Use Efficiency and Photosynthetic Efficiency

(iii) Back Cross and Test Cross

(iv) Photoperiods and Thermoperiods

(b) Mention few important pigments and their specific role in crops. Explain with examples. Briefly discuss the importance of photoperiodism and vernalization in agriculture.

(c) List out the major types of enzymes bio-synthesized in crops and their significant role in crop growth. Define growth and development and give an example for each process and their impact on crop production.

4. Answer any **three** of the following : 20×3 = 60

(a) In a given open field situation, the two crops viz., Sugarcane and Soybean are cultivated and will there be any difference in carbon

assimilation efficiency between them ? How would you justify your answer ?

(b) Discuss how the fats are synthesized in oilseed crops with suitable examples.

(c) Narrate the types of respiration processes and their importance in crop production. Give a brief account on significant role of plant growth regulators in Agricultural and Horticultural crops.

(d) Narrate the physiological changes occur during seed germination and how would you break and induce seed dormancy.

## SECTION – B

5. Answer any **three** of the following : 20×3 = 60

(a) Narrate the various techniques of dryland horticulture and the crops suitable and their economic importance.

(b) What do you mean by global warming and discuss the impact of climate change in agriculture, Narrate the strategies to be adopted for alleviating the climatic effects in crop production.

(c) What do you mean by land scaping and how would you design lawn and/or garden for a large scale industry ?

(d) Give a brief account on the methods of preservation of fruits and vegetables. Narrate how they are processed and explain their significance.

6. (a) Give a brief account on the various diseases and pests of tropical vegetables, tropical fruit crops and their management. 20

(b) Mode of action of contact and systemic pesticides with suitable examples. 20

(c) How would you forecast pests and diseases incidence of crops ? Give a brief account on the significance of biological control of pests and diseases in horticultural crops with suitable examples. 20

7. Discuss the storage pests and diseases occur in cereals and pulses with examples and their control.

Briefly explain about the commercial cultivation of mushroom and the importance of bee keeping. 60

8. (a) Write short notes on the following :

(i) Microbial toxins 20

(ii) Constraints in food processing and distribution 20

(b) Explain the food production and its consumption pattern in national dietary and its impact in alleviating the malnutrition. 20