

M.Sc. (Ag.) Examination, 2016
Semester-I
Subject: Genetics and Plant Breeding
Course No.: GPB-510
(Breeding for Biotic & Abiotic Stress Resistance)

Time: Three Hours

Full Marks: 50

Questions are of value as indicated in the margin

Answer any five questions

1. a. Define genetic resistance. 1
b. Describe briefly the various sources of disease resistance in crop plants. 2
c. Discuss about the different screening techniques commonly used for disease resistance. 5
d. How does the hypersensitivity reaction play an important role in disease resistance. 2
2. a. Define non-preference type of insect resistance. 2
b. 'Antibiosis' is a mechanism of insect resistance' – discuss. 3
c. What are the biochemical factors associated with insect resistance in crop plants. 2
d. "Wild species are good sources of insect resistance" – discuss with suitable examples. 3
3. a. Differentiate between drought avoidance and drought tolerance. 2
b. What are the various morphological and physiological characters associated with drought resistance. 4
c. Discuss about different breeding methods which are used for drought tolerant varieties in crop plants. 4
4. a. What do you mean by stress in crop plant? 1
b. What are different types of biotic and abiotic stresses? 3
c. Explain 'gene-for-gene' hypothesis with suitable example. 4
d. Name some functional proteins which function to protect cell from stress. 2
5. a. What are the different types of disease resistance in crop plants. Give a detailed classification of disease resistance mechanism based on defense structure. 5
b. Give a general outline of mutation breeding procedure for resistance to diseases & insects in autogamous crop plants. (2+3)+5=10
6. a. Define gene pyramiding. 1
b. Briefly discuss about the methods of gene transfer from wild species to crop plants. 5
c. Compare between vertical resistance and horizontal resistance. 4
7. Write short notes on the following (**any five**) : 2×5=10
 - i) Gene deployment
 - ii) Insect biotype
 - iii) Durable resistance
 - iv) Elicitor
 - v) DREB-1A gene
 - vi) Vertifolia effect
 - vii) Common phenolics and phytoalexins
 - viii) Multiline variety