M.Sc. (Ag.) Examination, 2016
Semester-I
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.
   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

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