

(vii) Biopesticide agents based in ISR

Your Roll No.....

4. (a) CTR1 acts as a negative regulator of the ethylene response pathway. Justify this statement by describing the pathway in detail. (8)

(b) How can CRISPR-Cas9-based genetic engineering be used for crop improvement? Discuss with a suitable example. (7)

5. (a) Explain the types of effector molecules and how they facilitate the colonization of plant host cells. (7)

(b) Discuss the role of any two different transcription factor families of your choice in mediating plant defense response. (8)

6 (a) Explain flagellin-induced resistance as a representative model of pattern-triggered immunity in plants. (7)

(b) Describe the major signaling pathway in plant defense against insect herbivores and explain how signals reach distal tissues to prepare for impending herbivory, with one example. (8)

Sr. No. of Question Paper : 7231

L

Unique Paper Code : 2163010020

Name of the Paper : Immunological Concepts and Applications in Plant Science

Name of the Course : **Botany**

Semester : VIII

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Each question carries **15** marks, so attempt **FOUR** questions in all.
3. Question No. **1** is compulsory.

1. (a) Define the following (**Any five**) (5×1=5)

(i) Valence

(ii) Elicitors

(iii) PR genes

(iv) Cuticle

7231

2

- (v) Biotrophs
- (vi) Calcium signatures
- (b) Expand the following **(Any five)** (5×1=5)
 - (i) MYB
 - (ii) CBLs
 - (iii) CTR1
 - (iv) PAMPs
 - (v) JAR
 - (vi) *Flg22*
- (c) Fill in the blanks **(any five)** (5×1=5)
 - (i) The _____ model predicts resistance when R gene matches an Avr gene.
 - (ii) _____ type of fungus, first kills the host and then feeds upon it.
 - (iii) _____ is also known chemically as N-(17-hydroxylinolenoyl)-L-glutamine, that induces volatile secondary metabolites in maize plants.
 - (iv) WRKY transcription factors binds specifically to the _____ element present in promoters of pathogen-responsive genes.

7231

3

- (v) _____ an 18 amino acid fragment of the bacterial elongation factor Tu.
- (vi) _____ are filled with a nasty cocktail of histamine, oxalic acid, tartaric acid, formic acid, and serotonin.
- 2. Differentiate between **any three** : (3×5=15)
 - (i) SAR and ISR
 - (ii) Cyst nematodes and Root Knot Nematodes
 - (iii) Compatible and incompatible plant parasite interactions
 - (iv) Plant and Animal Immune Systems
- 3. Write short notes on **any five** of the following : (5×3=15)
 - (i) Structure of antibody
 - (ii) Role of respiratory burst oxidase homolog protein
 - (iii) SiRNA as a tool for imparting disease resistance in plants.
 - (iv) Gene-for-gene hypothesis: a Flor's Model
 - (v) Pre-existing biochemical defences
 - (vi) Mechanical barriers constitute the first line of defence

P.T.O.