

Roll No. : (in figure) _____ (in words) _____

Student Index No. _____ Regn. No. _____ of _____

Time : Two Hours**Full marks : 50**

Questions are of value as indicated in the margin

Part - I
(Objective and Short Answer Type)
(Use only ball point pen)

Time : 30 minutes**Full marks : 20****Note:** 1. Answer in question paper itself.

2. Striking, rewriting or overwriting are not allowed in the objective type questions.

1. Fill up the blanks with most appropriate words (any five) :**1×5=5**

- i) The genus *Trichoderma* was first proposed by _____ in the year 1794.
- ii) Pebrine disease of silkworm is caused by _____.
- iii) First demonstration of induced resistance following *Trichoderma* inoculation was done on _____ crop against fungi *Colletotrichum spp.*
- iv) Father of Insect pathology is _____.
- v) The term Biological control was coined by _____.

2. Match the following source of antagonists with their commercial product.**5×1=5**

No.	Products	No.	NPV
1	DD 136	a	NPV
2	Dipel	b	<i>Trichoderma harzianum</i>
3	Dagger G Elcar	c	<i>Aspergillus niger</i> AN-27
4	Kalisena	d	<i>Neoplectana carpocapsae</i>
5	Trichodex	e	<i>Bacillus thuringiensis</i>

3. Tick (✓) the correct alternatives:**5×1=5**

- a) Pupal parasitoid used in Biological control is
i) *Ichneumonone sp.* ii) *Apanteles sp.* iii) *Trichogramma sp.* iv) *Xanthopimpla sp.*
- b) Tactitious host for mass multiplication of *Trichogramma sp.* is
i) *Spodoptera litura* ii) *Corcyra cephalonica* iii) *Galleria sp.* iv) None of these
- c) *Trichoderma harzianum* produces the following cell wall degrading enzymes during mycoparasitism
i) Chitinase ii) Proteinase iii) Lipases iv) All of these
- d) The virulent factors of *Bacillus thuringiensis* are
i) Proteases ii) Delta endotoxin iii) VIP toxin iv) All of these
- e) The common delivery methods of *Trichoderma spp.* is
i) Seed treatment ii) Soil application iii) Foliar spray iv) All of these

4. Write in brief

- | | |
|---|-----|
| a) Contribution of S.D. Garret in bio control for plant disease management. | 2.0 |
| b) Special characters of predators. | 1.5 |
| c) Differentiate multiple and super parasitism. | 1.5 |

B.Sc. (Honours) Agriculture Examination, 2019

Semester-IV

Course No: PPT-221

(Bio Pesticides and Bio Control)

Part - II

(Descriptive Type)

Time : 90 Minutes

Full marks : 30

Questions are of value as indicated in the margin

Answer any three questions

5. Define biological control. Why biological control has gained popularity for plant disease management? Discuss the following mechanism of actions involved in biological control agents with suitable examples. (i) competition (ii) Siderophore. 2+2+6=10
 6. Define Microbial control. Give a brief account on mode of action of *Bacillus thuringiensis*. Discuss about the merits and demerits of microbial control.
 7. Write short note (**any four**) : 2.5×4=10
 - a) Bacteria as bio control agents of plant diseases
 - b) Antibiotics and Bacteriocin
 - c) Characteristics of ideal bio control agents (BCAs)
 - d) BCA *Trichoderma* and seed biopriming
 - e) Mass multiplication of *Trichoderma* sp.
 - f) Why self life is more important in bio pesticide formulation.
 8. Describe the mass production of NPV and white muscardine fungi. 5+5=10
 9. Write about the techniques in biological control. How quality control in bio-pesticides can be maintained. 6+4=10
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