MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD PUNE
SEMESTER END THEORY EXAMINATION
B.Sc.(Hons.) Agriculture
[Fifth Deans' Committee Recommended Syllabus]

Semester	: IV	Term	: Second	Academic Year	: 2024-25
Course No.	: ELE-PATH 243	Title	: Bio-fertilizers, Bio-control Agents and Bio-pesticides		
Credits	: 3(2+1)				
Day & Date	: Friday, 25.04.2025	Time	: 9:00 to 12:00 hrs.	Total Marks	: 80

Note :
1. Solve **ANY EIGHT** questions from **SECTION 'A'**.
2. All questions from **SECTION 'B'** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagram wherever necessary.

SECTION 'A'

Q.1 Explain in brief different methods of application of biofertilizers.

Q.2 Write short notes on (Any Two):

a) Quality standards for biofertilizers
b) Mass production of *Trichoderma*
c) Attributes of an ideal insectary
d) Biopesticide CIB registration

Q.3 Explain in brief the Nitrogen cycle with suitable diagram.

Q.4 Define Biofertilizers. Write their importance in Agriculture and Organic farming system.

Q.5 Comment on the following (Any Four):

a) Marketing strategies for biofertilizers
b) Mass production of *Rhizobium*
c) Mass production of *Crysoperla*
d) Biochemistry of Nitrogen fixation
e) Importance of *Pseudomonas* as a biocontrol agent

Q.6 Give the types of biofertilizers, bioagents and biopesticides with suitable examples.

Q.7 Comment on the following (Any Four):

a) *Trichogramma* b) *Rhizobium* c) BGA d) Azolla e) *Metarhizium*

Q.8 a) Explain in brief the role of microbes in organic matter decomposition.
b) Write cross inoculation group amongst *Rhizobium.*

Q.9 Define Bioagents. Enlist the factors responsible for effectiveness of bioagents. Explain the mechanism of disease control by bioagents.

Q.10 Write one important contribution of the following Scientists (Any Eight):

a) Leeuwenhoek
b) J.B. Boussingault
c) N.V. Joshi
d) Frank
e) Nobbe and Hiltner
f) Dobereiner
g) Beijerinck
h) Ishwaran
i) M.R. Madhok
j) C.V. Riley

(P.T.O.)

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SECTION 'B'

Q.11 Match the pairs:

'A'	'B'
1) *Azospirillum*	a) Legume symbiosis
2) *Rhizobium*	b) Nostoc
3) Azolla	c) *Cynodon dactylon*
4) Blue Green Algae	d) Aquatic fern
5) *Trichogramma*	e) *Helicoverpa armigera*
6) PSB	f) *Glomus*
7) Mycorrhiza	g) *Pseudomonas striata*
8) *Nomuraea*	h) *Corcyra cephalonica*

Q.12 Fill in the blanks:

1) The symbiotic association between fungus and root system of higher plants, is termed as _____.
2) Majority of the plants utilize Nitrogen in _____ form.
3) _____ is a site of Nitrogen fixation in blue green algae.
4) As per Indian standards, minimum CFU count required for registration of formulation of entomo-pathogenic fungi, is _____.
5) As per Indian standards, minimum POB count required for registration of formulation of Nuclear Polyhedrosis Virus (NPV) is _____.
6) Central Insecticide Board is located at _____.
7) _____ is the associative Nitrogen fixing bacterium.
8) The enzyme involved in biological Nitrogen fixation is _____.

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