B.Sc.(Ag)—IIS(BT-121)

2019

(2nd Semester)

Time : 2 hours

Full Marks : 50

Answer **all** the questions

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(AGRICULTURAL MICROBIOLOGY)

1. Fill in the blanks : $\frac{1}{2} \times 14$

(*i*) Bacteria which obtain their energy from oxidation of inorganic compounds are called _____.

(*ii*) The genus _____ comprises the highest population of actinomycetes in soil.

(*iii*) Mesophilic bacteria functions within _____ temperature range.

(*iv*) The microbial assimilation of inorganic *N* in soil is termed _____.

(*v*) The period of time in which a bacterial population is doubled is called _____.

(*vi*) _____ is a suitable species for Vermicomposting.

(*vii*) Conversion of ammonium to nitrate nitrogen occurs through the process of _____.

(*viii*) _____ is commonly designated as father of soil microbiology.

(*ix*) The insoluble component of humic fraction of humus is called _____.

(*x*) In acid soils _____ group of microbes are prominent.

(*xi*) The unique soil environment under the influence of plant root is called _____.

(*xii*) _____ is a fungus used as phosphate solubilizing microorganism.

(*Continued*)

(*xiii*) _____ bacteria obtain their energy from complex organic matter.

(*xiv*) Pink colour of nodule is due to the presence of _____.

2. Match the column B with column A : $\frac{1}{2} \times 6$

	A	B
(*i*)	Mycorrhizae	Free living N fixer
(*ii*)	Cytophaga	S oxidizer
(*iii*)	Azotobacter	Denitrifier
(*iv*)	Thiobacillus	Blue green algae
(*v*)	Bacillus	Cellulose decomposer
(*vi*)	Cyanophyta	Fungi & roots of higher plant association

3. Give scientific reasons for the following (any *three*) : 1×3

(*i*) Fresh cow dung should not be applied in a standing crop field.

(*ii*) C/N ratio in soil is maintained at 10-12 : 1.

(*Turn Over*)

(*iii*) Nitrites do not accumulate in soil during the process of nitrification.

(*iv*) Decomposition of legume residues is faster than the paddy straw.

4. Differentiate between (Any *four*) : 1 × 4

(*i*) Mineralization and Immobilization.

(*ii*) Nitrification and denitrification.

(*iii*) Rhizosphere and Phyllosphere.

(*iv*) Photoautotroph and Chemoautotroph.

(*v*) Prokaryote and Eukaryote.

5. Write short notes on (Any *four*) : 2 × 4

(*i*) Biochemical mechanism of N_2 fixation.

(*ii*) Significance of C : N ratio of incorporated residues in soil.

(*iii*) Factors affecting denitrification in soil.

(*iv*) Microbial biocontrol.

(*v*) Host specificity of Rhizobium.

6. Answer the following questions (any *five*) : 5 × 5

(*a*) What do you mean by growth of organisms ? State briefly the important factors affecting growth and activity of microorganisms in soil.

(*b*) Mention the steps and organisms involved in biological nitrification. Discuss the important factors affecting nitrification in soil.

(*c*) What is biological nitrogen fixation ? Describe the root nodule formation with different stages of development in legume root and draw the necessary diagrams.

(*d*) Write in detail about transformation of sulphur in soil.

(*e*) What is biofertilizers ? What are the different classes of biofertilizers ? Briefly discuss about the methods of application of biofertilizers in field.

(*f*) Write in details about classification of organisms in soil and its beneficial role.
