Total No. of Questions: 6 *Total No. of Printed Pages:2*

Enrollment No.....

Faculty of Agriculture

End Sem (Even) Examination May-2022

AG3CO08 Agricultural Microbiology

Programme: B.Sc. (Hons.) Branch/Specialisation: Agriculture

Duration: 3 Hrs. **Maximum Marks: 50**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Gram staining method was developed by- **1**
(a) Edward Jenner (b) Christian Gram
(c) Louis Pasture (d) Robert Hook

ii. Flagella in bacteria enable them to- **1**
(a) Reproduce (b) Locomote
(c) Thrive in nutrient agar (d) Adhere to tissue surfaces

iii. The enzyme that catalyzes the transposition of an IS element is called- **1**
(a) Integrase (b) Transcriptase
(c) Transposase (d) Polymerase

iv. The Ti plasmid is found in- **1**
(a) Yeast as a 2mm plasmid
(b) 'Rhizobium' of the roots of leguminous plants
(c) 'Azotobacter'
(d) 'Agrobacterium'

v. Negative logarithm of hydrogen ion concentration is known as- **1**
(a) EC (b) Ion exchange (c) CEC (d) pH

vi. In gram staining method which stains is known as primary stain? **1**
(a) Safranine (b) Ethyl alcohol
(c) Crystal violet (d) Iodine

vii. The conversion of nitrates back into the largely inert nitrogen gas (N_2) is called- **1**
(a) Ammonification (b) Nitrification
(c) Dinitrification (d) Aminization

viii. Examples of ectomycorrhizal fungi- **1**
(a) Basidiomycetes (b) Ascomycetes
(c) Zygomycetes (d) All of these

P.T.O.

ix. A neem product used as insect repellent is- **1**
(a) Rotenone (b) Parathion (c) Azadirachtin (d) Endrin

x. Mycorrhiza is used as bio-fertilizer, belongs to which genus of fungi? **1**
(a) Glomus (b) Apiaceae (c) Cruciferae (d) Zinzibaceae

Q.2 i. What is agricultural microbiology? **1**
ii. Write a short note on prokaryotic microbes. **2**
iii. What are different shapes of bacteria? Explain it. **5**
OR iv. Differences between gram positive and gram negative eubacteria. **5**

Q.3 i. What is genetic recombination? **1**
ii. Define transcription. **3**
iii. What is conjugation? Explain it. **4**
OR iv. Define the term genetic code. Explain the concept of Lac Operon in E. coli. **4**

Q.4 i. Draw the nitrogen cycle and give a brief explanation. **2**
ii. How are microbes useful in soil fertility and crop production? **6**
OR iii. Draw the carbon cycle. In what ways microbes are useful in carbon cycle. **6**

Q.5 i. Define Rhizoplane and Phyllosphere. **2**
ii. Write down a short note on Mycorrhiza. **2**
iii. What is nitrogen fixation? Distinguish between symbiotic and non-symbiotic nitrogen fixation. **4**
OR iv. Explain nitrification with their steps. **4**

Q.6 Attempt any two:
i. Explain biofertilizer with their classification. **4**
ii. What exactly are biopesticides? What are the advantages of using biopesticides? **4**
iii. What is biodegradation? Explain the term "biodegradation" in relation to the production of biogas. **4**

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Marking Scheme
AG3CO08 Agricultural Microbiology

Q.1	i.	Gram staining method was developed by- (b) Christian Gram		**1**
	ii.	Flagella in bacteria enable them to- (c) Thrive in nutrient agar		**1**
	iii.	The enzyme that catalyzes the transposition of an IS element is called (c) Transposase		**1**
	iv.	The Ti plasmid is found in- (d) 'Agrobacterium'		**1**
	v.	Negative logarithm of hydrogen ion concentration is known as- (d) pH		**1**
	vi.	In gram staining method which stains is known as primary stain? (c) Crystal violet		**1**
	vii.	The conversion of nitrates back into the largely inert nitrogen gas (N_2) is called- (c) Dinitrification		**1**
	viii.	Examples of ectomycorrhizal fungi- (d) All of these		**1**
	ix.	A neem product used as insect repellent is- (c) Azadirachtin		**1**
	x.	Mycorrhiza is used as bio-fertilizer, belongs to which genus of fungi? (a) Glomus		**1**
Q.2	i.	Agricultural microbiology		**1**
	ii.	Prokaryotic microbes.		**2**
	iii.	Different shapes of bacteria		**5**
OR	iv.	Differences between gram positive	2.5 marks	**5**
		Gram negative eubacteria	2.5 marks	
Q.3	i.	Genetic recombination		**1**
	ii.	Definition of transcription		**3**
	iii.	Conjugation	2 marks	**4**
		Mechanism	2 marks	
OR	iv.	Definition of genetic code	1.5 marks	**4**
		Lac Operon in E. coli.	2.5 marks	
Q.4	i.	Diagram of nitrogen cycle and explanation		**2**
	ii.	Microbes useful in soil fertility	3 marks	**6**
		In crop production	3 marks	
OR	iii.	Draw the carbon cycle	2 marks	**6**
		Ways microbes are useful in carbon cycle	4 marks	
Q.5	i.	Define Rhizoplane	1 mark	**2**
		Phyllosphere	1 mark	
	ii.	Short note on Mycorrhiza.		**2**
	iii.	Nitrogen fixation	1 marks	**4**
		Symbiotic and non-symbiotic nitrogen fixation	3 marks	
OR	iv.	Nitrification	2 marks	**4**
		Nitrification with their steps	4 marks	
Q.6		Attempt any two:		
	i.	Biofertilizer	1.5 marks	**4**
		Their classification	1.5 marks	
	ii.	Biopesticides	1.5 marks	**4**
		Advantages of using biopesticides	2.5 marks	
	iii.	Biodegradation	1.5 marks	**4**
		Biodegradation" in relation to the production of biogas	2.5 marks	

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