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Name :	(4)
Roll No.:	An Alasman Of Commission 2 and Experience
Inviailator's Sianature:	

CS/M.TECH (PHMC)/SEM-2/PHMC-203/2011

2011 AGRICULTURAL & SOIL MICROBIOLOGY

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer question No.1 and any three from each Group.

GROUP - A (Objective Type Questions)

- a) What is the difference between Paleolithic, Mesolithic and Neolithic periods?
 b) What is the difference between Edible and Non-edible Oilcakes?
 - c) What is the difference between dS/m and mmho/cm? 1
 - d) Why is the decomposition of organic manure in soil essential?
 - e) In HYV Rice N: P: K is 36:18:18.

What does it mean?

1

f) Name one free-living N-fixer and one Pseudo-Nodule forming Rhizobia.

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- g) Se, As and I are important to the plant but they are not essential for plant nutrition comment.
- h) Soil + $CaCO_3 \rightarrow products$?

1

- i) Name one Commercially important Fungal, one Bacterial and one Viral Biopesticide.
- j) N_2 (g) + 3 H_2 (g) \rightarrow 2NH₃ (g) (Δ H = 92.4 kJ. mol). Comment on this equation.

GROUP - B

- 2. a) Why is Organic Farming better than Chemical Farming?
 - b) The use of Rhizobium for Nitrogen fixation is cost effective than the use of Urea. Explain with example.
 - c) Name some microbes used as N-Biofertilizer. How one could get good response to biofertilizer application?

3 + 2 + 5

- 3. a) Explain the procedure of commercial production of Biocompost.
 - b) How does Biocompost help in recovering soil health?
 - c) Briefly describe the different types of Biocompost.

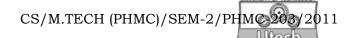
4 + 3 + 3

4. Write short notes on the following:

5 × 2

- a) Green Manure and Farm Yard Manure
- b) Solid and Liquid Biofertilizers

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- c) Nodulation in Rice
- d) Explanation of one of the following being not a biopesticide:

Trichoderma, Larval-parasitoid, Pseudomonas fluorescence, NPVs, DDT, Azadirectin.

- e) EPA and NCIPM.
- 5. a) Name two Nitrifying bacteria and state their role in controlling water pollution.
 - b) Which PGPRs solubilize phosphate and potash in the soil and how?
 - c) Name four major genus of the Family Rhizobiaceae.
 - d) Differentiate between symbiotic and free-living N-fixers.

3 + 3 + 2 + 2

- 6. a) State the basic differences between INM and IPM.
 - b) How are they related to Organic Farming?
 - c) Briefly describe the mechanism of action of Viral biopesticide with an example. 3 + 3 + 4
- 7. a) What is PGPR and how are they related to plant Growth?
 - b) Define VAM and their role in plant growth promotion.
 - c) Differentiate Denitrification from Nitrogen Fixation and describe their importance in Sustainable Agriculture.

4 + 3 + 3

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GROUP - C

- 8. a) What is soil organic matter?
 - b) Write the principle of determining soil organic matter.
 - c) Explain how soil organic matter is determined. 3 + 2 + 5
- 9. a) Nitrogenase is a two-component protein. Explain.
 - b) What is the obligatory part of introgen-spiltting reaction?
 - c) What are NOD genes?
 - d) Nodulation by *Rhizobium* does not necessarily guarantee nitrogen fixation. Explain. 2 + 1 + 3 + 4
- 10. a) How are pesticides classified?
 - b) Phosphoric acid is a triprotic acid. True of False?
 - Ban of pesticides leads to loss of crop, loss of jobs and world hunger. Explain
 - d) Use of DDT is disastrous to biodiversity. Comment.

3 + 1 + 4 + 2

- 11. a) What is DDT resistance? Explain.
 - b) Organophosphates and carbamates are structurally different but their mechanism of action as pesticide is same. Explain. 4 + 6
- 12. a) What is fertilizer burn?
 - b) Write a brief on environmental effects of fertilizer use.

3 + 7