

Seat No. : _____

NE-102

November-2013

B.Sc. Semester – III

Core – 202 : Microbiology

(Soil and Water Microbiology)

Time : 3 Hours]

[Max. Marks : 70

Instruction : All questions carry equal marks.

1. Answer the following : (Any **two**) **14**
 - (a) Enlist various types of microbial interactions in soil and describe mutualism.
 - (b) Describe Winogradsky column and give its significance.
 - (c) What is Mycorrhizae ? Outline the difference between Endomycorrhizae and Ectomycorrhizae.
 - (d) Describe Rhizosphere and its impacts.

2. Answer the following : (Any **two**) **14**
 - (a) Enlist different stages of N₂ cycle and describe nitrification and denitrification.
 - (b) Describe sulfur cycle.
 - (c) Write a detailed note on biofertilizers.
 - (d) Write notes on :
 - (i) Iron cycle
 - (ii) Role of Algae in increasing soil fertility

3. Describe any **two** of the following : **14**
 - (a) IMViC test
 - (b) Standard Plate Count
 - (c) Detection of coliforms in water
 - (d) Steps of drinking water purification

4. Answer the following : (Any **two**) **14**
- (a) Write a note on anaerobic sludge digestion.
 - (b) Describe the pollution problems occurring due to disposal of untreated waste water.
 - (c) Describe activated sludge process as a treatment for waste water.
 - (d) Enlist different types of waste water and describe chemical and microbiological characteristics of domestic waste.
5. Answer the following in **one to two** lines only : **14**
- (1) Give one function of fungi in increasing soil fertility.
 - (2) Give two examples of predatorship.
 - (3) Define soil.
 - (4) What is humus ?
 - (5) Give examples of nonsymbiotic Nitrogen fixing bacteria.
 - (6) Write the names of microorganisms involved in carbon cycle.
 - (7) Give examples of phosphate solubilizing microorganisms.
 - (8) Why coliforms are used as fecal indicators ? (Any two reasons)
 - (9) Name two water borne diseases along with their causative agents.
 - (10) Enlist nuisance flora of natural water.
 - (11) What is TOD and COD ?
 - (12) Give examples of bacteria involved in trickling filter.
 - (13) What is composting ?
 - (14) Give two disadvantages of oxidation ponds.
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