Gujarat University

B.Sc. (Sem. - III)

November - 2013

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 N_2 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

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

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.

Answer the following in one to two lines only :

(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 micro-organisms involved in carbon cycle.

(7) Give examples of phosphate solubilizing micro-organisms.

(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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