

Seat No. : _____

NJ-113

December-2015

B.Sc., Sem.-III

Core Course-202 : Microbiology

Time : 3 Hours]

[Max. Marks : 70

Instructions : (1) Figures on right side indicate marks.
(2) Draw neat figures wherever necessary.

1. Answer the following : (any **two**) **14**
 - (a) What do we mean by microbial interactions ? Discuss positive interactions in soil.
 - (b) Discuss advantages and disadvantages of methods to study soil micro flora.
 - (c) Write a note on mycorrhizia.
 - (d) Describe role of Winogradsky Column in studying microbial diversity of soil.

2. Describe the following : (any **two**) **14**
 - (a) Nitrogen cycle
 - (b) Biofertilizers
 - (c) Carbon cycle
 - (d) Role of microorganisms in enhancing soil fertility

3. Answer the following : (any **two**) **14**
 - (a) What is potable water ? Describe sources of contamination in natural water bodies.
 - (b) Discuss differentiation tests for coliforms.
 - (c) What is disease ? Discuss water borne diseases.
 - (d) What is quantitative analysis of water ? Discuss total viable count as enumeration method.

4. Answer the following : (any **two**) **14**
- (a) Enlist types of wastewater and describe physical and chemical characteristics of domestic waste.
 - (b) Discuss trickling filter as a method for waste water treatment.
 - (c) Write a detailed note on anaerobic sludge digestion.
 - (d) Write notes on :
 - (i) Primary treatment of sewage
 - (ii) Disinfection step in waste water treatment

5. Answer the following in **one to two** lines : **14**
- (1) What is antagonism ?
 - (2) Name both the partners in the phenomenon of root nodulation.
 - (3) Give two negative impacts of microorganisms on plants in Rhizosphere.
 - (4) Name the soil horizon with least microbial activity and give reason for the same.
 - (5) Name two phosphate-solubilizing bacteria.
 - (6) Give examples of aerobic Iron bacteria.
 - (7) What is immobilization and mineralization of elements ?
 - (8) What is the role of *Trichoderma viridae* in carbon cycle ?
 - (9) Give two disadvantages of MPN method.
 - (10) Name the media which can be used for detection of coliforms.
 - (11) Give the role of slime forming bacteria as nuisance flora of water.
 - (12) Outline the difference between septic tank and Imhoff tank.
 - (13) What is the difference between BOD, COD and TOD ?
 - (14) What type of microorganisms can create bulking sludge during activated sludge treatment ?
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