

Seat No. : _____

JB-104

January-2021

B.Sc., Sem.-III

202 : Microbiology

Soil and Water Microbiology

(New)

Time : 2 Hours]

[Max. Marks : 50

- Instructions :**
- (1) Students should write the answers from the question paper applicable to them; either “NEW COURSE” OR “OLD COURSE” and it must be mentioned at the beginning of the answer paper.
 - (2) Attempt any **THREE** questions out of **EIGHT** questions. **Question No. 9 is COMPULSORY.**
 - (3) Draw figures wherever necessary.
 - (4) Figures to the right indicate marks.

1. Describe different methods of studying soil micro flora. 14
2. (A) Explain with suitable microbial examples : antagonism, parasitism and predation. 7
(B) Write a note on Rhizosphere & its significance. 7
3. Explain Nitrogen Cycle. 14
4. (A) Write a note on use of Biofertilizers in increasing soil fertility. 7
(B) Describe Sulphur cycle. 7
5. Draw flow diagram of drinking water purification plant and describe its operation in detail. 14
6. (A) Write a note on Nuisance microorganisms in water. 7
(B) Describe presumptive and completed tests for qualitative bacteriological analysis of water. 7
7. Explain Anaerobic sludge digestion & composting for solid waste processing. 14
8. (A) Draw overall installation and cross section of septic tank. Explain how it works. 7
(B) Describe Trickling filters. 7

9. Give short and specific answers in 1-2 lines only (any **Eight**)

8

- (1) Name the fungi associated with Mycorrhiza.
 - (2) What is Syntrophism ?
 - (3) Give examples of commensalism in soil.
 - (4) Name two water borne diseases & their causative organisms.
 - (5) Name pollution indicator bacteria other than coliforms.
 - (6) Give examples of Nitrifying & denitrifying bacteria.
 - (7) Define BOD & TOD.
 - (8) Write two problems associated with disposal of untreated waste.
 - (9) Give example of Lignolytic fungi.
 - (10) What is P-A test ?
 - (11) What is immobilization & mineralization of elements ?
 - (12) Name two phosphate solubilizing bacteria.
 - (13) Give two disadvantages of oxidation ponds.
 - (14) What is the role of protozoa in soil ?
 - (15) Name two bacteria involved in Iron cycle.
 - (16) What is Bulking sludge ?
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1. Describe positive & negative associations amongst microorganisms in soil. 14
2. (A) Discuss enrichment culture technique & buried slide technique to study soil microflora. 7
(B) Write a note on : Physico-chemical characteristics of soil. 7
3. Describe Carbon cycle. 14
4. (A) Explain : Nitrogen fixation & denitrification. 7
(B) Write a note on : Biofertilizers. 7
5. What is disease ? Discuss water borne diseases. 14
6. (A) Discuss differentiation tests for coliforms. 7
(B) What is quantitative analysis of water ? Discuss total viable count as enumeration method. 7
7. Enlist different types of waste water and describe chemical and microbiological characteristics of domestic waste water. 14
8. (A) Describe activated sludge process. 7
(B) Explain Imhoff tank with a suitable diagram. 7

9. Give short and specific answers in 1-2 lines only (any **Eight**).

8

- (1) Give examples of symbiotic Nitrogen fixing bacteria.
 - (2) Define soil.
 - (3) What is humus ?
 - (4) Give the role of fungi in increasing soil fertility.
 - (5) Full form of TOD & COD.
 - (6) Give examples of bacteria that develop on trickling filters.
 - (7) What is Synergism ?
 - (8) What is P-A test ?
 - (9) Name the nuisance causing organisms.
 - (10) What type of microorganisms can cause bulking of sludge during activated sludge treatment ?
 - (11) Write one beneficial role of Mycorrhiza.
 - (12) How many glucose molecules are there in cellobiose ?
 - (13) What is serial dilution ?
 - (14) Give the full form of MPN.
 - (15) Give two examples of water borne diseases.
 - (16) Give one difference between sludge and sewage.
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