

**MI-202 : Microbiology (Soil and Water Microbiology)****[Max. Marks : 70]****[Time: 3 Hours]****Instructions : (1) All questions carry equal marks.**

- (2) Draw figures wherever required.
- (3) Write correct question number.
- (4) Draw neat and labelled figures wherever needed.

**1. Answer the following (any two) [14]**

- (a) Describe the negative associations amongst microorganisms in soil.
- (b) Describe the phenomenon of root nodulation.
- (c) Write an account on physical and chemical properties of soil.
- (d) Enlist methods to study soil micro flora and describe enrichment culture and buried slide technique.

**2. Describe the following : (any two) [14]**

- (a) Sulphur cycle
- (b) Role of bacteria in nitrogen fixation
- (c) Write notes on : (i) Phosphorous cycle  
(ii) Fungi as soil microflora
- (d) Write notes on : (i) Humus  
(ii) Soil Actinomycetes

**3. Describe the following (any two) [14]**

- (a) Coliforms as indicators of fecal pollution
- (b) Nuisance microorganisms in water
- (c) MPN as quantitative method
- (d) Purification of potable water

#### 4. Describe the following (any two)

- (a) Oxidation ponds
- (b) Composting
- (c) Chemical and microbiological properties of domestic waste.
- (d) Write notes on : (i) Imhoff tank  
(ii) Final treatment for waste.

#### 5. Answer the following very briefly

- (a) What is syntrophy ?
- (b) Name the fungi associated with mycorrhizae.
- (c) Give examples of commensalism in soil.
- (d) Name two bacteria participating in C cycle.
- (e) Name the lignolytic fungi.
- (f) What is the role of protozoa in soil ?
- (g) Name denitrifying bacteria.
- (h) What is BOD ?
- (i) Enlist two problems associated with disposal of urban waste.
- (j) Name pollution indicator bacteria other than *Escherichia coli*.
- (k) What is P/A test ?
- (l) What is bulking sludge ?
- (m) Name two water borne viral diseases.
- (n) Name the chemicals used in settling tank during treatment.