

**2017**

**M.Sc.**

**3rd Semester Examination**

**MICROBIOLOGY**

**PAPER—MCB-302**

*Full Marks : 40*

*Time : 2 Hours*

*The figures in the right-hand margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

***Separate answer scripts to be used for each group.***

**Group — A**

**[Marks : 20]**

**Answer any two questions.**

1. (a) What are possible effects of endophytic fungi on plants ?  
  
(b) Briefly defined about rhizosphere, rhizoplane and associative nitrogen fixation by rhizospheric microbes.

*(Turn Over)*

- (c) What is biogeochemical cycling ? Briefly write its importance.
- (d) What do you mean by mineralization and immobilization. Describe in brief with examples.

3+3+2+2

2. (a) What is bio-fertilizer ? Give example of bacterial bio-fertilizer.
- (b) What are the advantages and benefit of bio-fertilizers over chemical fertilizer.
- (c) Write the mass production technique and application methods of *Azotobacter* as biofertilizer.

2+3+3+2

3. Write notes on any *four* of the following : 4×2.5

- (a) Biopesticides ;
- (b) IAA and its importance in plant tissue culture ;
- (c) Adventitious embryogenesis ;
- (d) Callus and its significance ;
- (e) Vermicompost ;
- (f) Protoplast technology.

**Group — B**

[Marks : 20]

Answer any *two* questions.

1. (a) What is the importance of vaccination ?
- (b) State the difference between live attenuated and killed vaccine.
- (c) Describe briefly about national immunization schedule.
- (d) What is combined vaccine ? 2+3+4+1
  
2. (a) Differentiate different expression system for recombinant vaccine production with their advantages and disadvantages.
- (b) How epitope designing technique facilitate the antidiotype vaccine development ?
- (c) What do you mean by HAT selection in monoclonal antibody preparation ? 4+4+2
  
3. Write short notes on (any four) : 4×2.5
  - (a) Toxoid ;
  - (b) Peptide Vaccine ;

- (c) Blood group antigen ;
  - (d) Hazards of vaccination ;
  - (e) Signature proteins of HIV for vaccine development ;
  - (f) Western blot technique.
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