

2013

M.Sc.

4th Semester Examination

MICROBIOLOGY

PAPER—MCB-401 (XIX)

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.

Answer any two questions from each group.

Group — A

[Marks : 20]

Answer any two questions.

1. Differentiate between (any four) : $4 \times 2\frac{1}{2}$
- (a) Resistance stability and Resilience stability.
 - (b) Simple ecotone & Multiple ecotone.
 - (c) Ecosphere and Biosphere.

(Turn Over)

- (d) Natural and Artificial ecosystem.
 - (e) Overshoot and Dieback of population.
 - (f) Gene frequency and genotype frequency.
 - (g) Crude birth rate & specific birth rate.
2. (i) Discuss the Universal model of energy flow. Why is it called 'Universal'?
- Add a note on two channel energy flow model.
- (ii) Discuss in brief the structure of ecosystem with reference to pond ecosystem. (3+1+2)+4
3. (i) What is an ecosystem? Define megabiodiversity country. How many megabiodiversity countries present in the world?
- (ii) What would be the frequency of heterozygotes, Aa, in a random mating population if the frequency of recessive phenotype (aa) is 0.36?

Group — B

[Marks : 20]

Answer any two questions.

4. (a) Why must water be subjected to microbiological analysis?
- (b) Describe two methods of water analysis.
- (c) State the principles of most probable number analysis.
- (d) Compare the microbial activity in the activated sludge process with that occurs in a septic tank. 1+4+1+4

5. Write notes on: 2+3+3+2
- (a) Bacterial diseases of fish ;
 - (b) Biodegradation of PCB ;
 - (c) Intramural aeromicrobiology ;
 - (d) Composting of biosolids.
6. (a) Provide an example of cometabolism.
- (b) Briefly describe the microbial leaching of copper.
- (c) Mention the steps of biodegradation of the following bio polymer by microorganisms :
- (i) Lignin ; (ii) Chitin. 2+4+4
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