

DEPARTMENT OF BIOTECHNOLOGY
B.Sc.-M.Sc. INTEGRATED PROGRAMME
SEMESTER III SUPPLEMENTARY EXAMINATION, 2021
Paper Title : MICROBIOLOGY
Paper Code – BBT-CC08 TH

Time : Three Hours

Maximum Marks : 75

Attempt all questions. All parts of a question must be attempted in continuation. Start answer of a fresh question on a new page. Cite examples and draw labeled diagrams.

Question No. 1:

[10 x 1 = 10]

A. Choose the correct option for the following questions:

- i) On the basis of temperature requirement most pathogenic bacteria are:
 - a. Thermophiles
 - b. Mesophiles
 - c. Psychrotrophs
 - d. Psychrophiles
- ii) Obligate aerobes possess which of the following characteristic:
 - a. Oxygen is essential for their growth
 - b. Greater growth in the presence of oxygen
 - c. Only aerobic growth with little oxygen.
 - d. No oxygen requirement
- iii) Which of the following nutrient uptake system requires carrier proteins?
 - a. Simple diffusion
 - b. Facilitated diffusion
 - c. Osmosis
 - d. Both a and b
- iv) Siderophores are involved in:
 - a. Iron uptake
 - b. Calcium uptake
 - c. Carbon homeostasis
 - d. Osmotic balance
- v) Which of the following is the reduced form of flavin adenine dinucleotide:
 - a. FAD
 - b. FADH₂
 - c. NADH
 - d. Coenzyme A
- vi) Which of the following refers to putrefaction?
 - a. Proteolysis and anaerobic breakdown of proteins.
 - b. Proteolysis and anaerobic breakdown of lipids.
 - c. Acidification of proteins.
 - d. Breakdown of carbohydrates.

vii) Classification based on evolutionary relationships are called:

- a. Phylogenetic classification
- b. Phenetic classification
- c. Natural classification
- d. All of the above

viii) Whittaker proposed:

- a. Six kingdom classification
- b. Five kingdom classification
- c. Three kingdom classification
- d. Seven kingdom classification

ix) Cell wall of fungi is composed of:

- a. Cellulose
- b. Peptidoglycan
- c. Chitin
- d. Pectin

x) Swan neck experiment which disproved spontaneous generation was given by:

- a. Louis Pasteur
- b. Aristotle
- c. Rudolf Virchow
- d. Joseph Lister

B. State whether True or False:

[5 x 1 = 5]

- i. Saprophytes are free living microbes on dead animals or decaying things found in soil and water.
- ii. Transformation is the genetic transfer from one bacterial cell to another by direct contact.
- iii. Endospore is dormant stage of some bacterium that allows it to survive in unfavourable conditions.
- iv. Lipopolysaccharide (LPS) is found in Gram positive bacteria.
- v. The theory of spontaneous generation held that living creatures could arise from nonliving matter and that such processes were common and regular.

Question-2

Attempt ANY TWO of the following:

[2 x 7.5 = 15]

- A. Louis Pasteur is regarded "Father of Modern Microbiology". Elaborate few of his contributions in this field.
- B. Describe with diagram Gram Negative bacterium.
- C. What are unique features of viruses and their basis of classification?
- D. Describe molecular biology techniques used for determining microbial taxonomy and phylogeny.

Question-3

Attempt **ANY ONE** (A or B) of the following:

[01 x 15 = 15]

A. Explain the following:

- i. Biochemical component of cell.
- ii. Growth factors required for microbial growth.
- iii. The categories of microorganisms on the basis of nutritional requirements, with examples.

OR

B. Elaborate the following:

- i. Two methods used to detect antibiotic sensitivity.
- ii. Categories of microorganisms on the basis of temperature requirement.
- iii. Various methods of anaerobic culturing of microorganism.

Question-4

Attempt **ANY TWO** of the following:

[2 x 7.5 = 15]

A. Explain the following:

- i. Measurement of cell number by serial dilution
- ii. Continuous culture
- iii. Batch culture

B. Explain the difference between conjugation and transduction.

C. Draw and explain the bacterial growth curve.

D. Describe different ways of measurement of cell numbers of microorganism.

Question-5

Attempt **ANY TWO** of the following:

[2 x 7.5 = 15]

A. Explain the following with suitable examples:

- i. Groups of water dwelling microorganisms
- ii. Indicator microorganism of water

B. Describe the various methods of food preservation used in food industry.

C. Describe in detail various categories of chemotherapeutic agents.

D. Describe important microorganism in food microbiology: Moulds, Yeast and Bacteria.