

QUESTION BANK – INTERNAL - I

BSC BIOTECHNOLOGY

SEMESTER – II

MICROBIOLOGY & IMMUNOLOGY

A. Multiple Choice Questions (MCQ)

1. Who is known as the “Father of Microbiology”?

- a) Robert Koch
- b) Louis Pasteur
- c) Joseph Lister
- d) Alexander Fleming

Answer: b) Louis Pasteur

2. The first person to observe microorganisms using a simple microscope was:

- a) Leeuwenhoek
- b) Jenner
- c) Edward Jenner
- d) Fleming

Answer: a) Leeuwenhoek

3. Bright-field microscopy works on the principle of:

- a) Light reflected from specimen
- b) Light absorption and transmission
- c) Electron beams
- d) Fluorescence emission

Answer: b) Light absorption and transmission

4. Which microscope is used to observe living, unstained cells?

- a) Electron microscope
- b) Phase-contrast microscope
- c) Fluorescent microscope
- d) Bright-field microscope

Answer: b) Phase-contrast microscope

5. Scanning Electron Microscope (SEM) provides:

- a) 2D internal structure
- b) 3D surface view
- c) Fluorescent visualization
- d) Virus structure only

Answer: b) 3D surface view

6. Viruses are composed of:

- a) Only RNA
- b) Only DNA
- c) DNA or RNA enclosed in protein coat
- d) Protein only

Answer: c) DNA or RNA enclosed in protein coat

7 Mycoplasma bacteria lack:

- a) Cell membrane
- b) Peptidoglycan and cell wall
- c) Cytoplasm
- d) DNA

Answer: b) Peptidoglycan and cell wall

8 Hepatitis is caused by:

- a) Bacteria
- b) Virus
- c) Algae
- d) Protozoa

Answer: b) Virus

9 Fluorescent microscopy uses:

- a) UV light and fluorochromes
- b) Natural sunlight
- c) Heat waves
- d) High-energy electrons

Answer: a) UV light and fluorochromes

10 Archaea differ from bacteria because:

- a) Their cell wall lacks peptidoglycan
- b) They have nucleus
- c) They are eukaryotes
- d) They cannot survive in extreme environments

Answer: a) Their cell wall lacks peptidoglycan

11 Autoclave sterilization works at:

- a) 100°C for 30 min
- b) 121°C for 15 psi for 15 min
- c) 150°C dry heat
- d) UV-light exposure

Answer: b) 121°C for 15 psi for 15 min

12 Nutritional types of bacteria that require only CO₂ as carbon source are:

- a) Heterotrophs
- b) Autotrophs
- c) Parasites
- d) Halophiles

Answer: b) Autotrophs

13 The stationary phase in a bacterial growth curve is where:

- a) Cells die rapidly
- b) Growth rate equals death rate
- c) Cells are adapting
- d) Exponential multiplication occurs

Answer: b) Growth rate equals death rate

14 A batch culture is characterized by:

- a) Open system with fresh medium

- b) Closed system without nutrient addition
- c) Continuous nutrient flow
- d) Constant population removal

Answer: b) Closed system without nutrient addition

5 The best method for sterilizing heat-sensitive media is:

- a) Autoclaving
- b) Dry heat
- c) Filtration
- d) UV-radiation

Answer: c) Filtration

6 Factors influencing bacterial growth include:

- a) Temperature
- b) pH
- c) Oxygen
- d) All of these

Answer: d) All of these

7 Culture grown under oxygen-free environment is called:

- a) Aerobic
- b) Anaerobic
- c) Facultative
- d) Microaerophilic

Answer: b) Anaerobic

8 A pure culture contains:

- a) Many species
- b) Only one species
- c) No microorganisms
- d) Mixture of viruses and bacteria

Answer: b) Only one species

9 The exponential or log phase is important for:

- a) Antibiotic production
- b) Vaccine production
- c) Cell counting and experiments
- d) All of these

Answer: c) Cell counting and experiments

10 The continuous culture maintained at constant growth rate using instrument chemostat is a type of:

- a) Batch culture
- b) Open-system culture
- c) Synchronous culture
- d) Surface culture

Answer: b) Open-system culture

B. Fill in the Blanks

1 _____ discovered the microbial world using a simple microscope.

Answer: Antonie van Leeuwenhoek

2 The technique that provides 3D images of specimens is _____.

Answer: Scanning Electron Microscopy (SEM)

3 _____ is known for the germ theory of disease.

Answer: Louis Pasteur

4 Dark-field microscopy is mainly used to view _____ microorganisms.

Answer: Thin and unstained

5 Mycobacterium causes the disease _____.

Answer: Tuberculosis

6 Viruses are _____ parasites.

Answer: Obligate intracellular

7 Micro-algae are useful for production of _____.

Answer: Biofuels (or pigments / proteins)

8 Bacteria typically reproduce by _____.

Answer: Binary fission

9 The protein coat surrounding viral nucleic acid is called _____.

Answer: Capsid

10 Electron microscopy uses _____ instead of light.

Answer: Electron beams

11 Sterilization by dry heat in an oven is done at _____ for 2 hours.

Answer: 160°C

12 Bacterial growth curve consists of four phases: lag, log, stationary and _____.

Answer: Death phase

13 Nutrients required by bacteria in large amounts are called _____.

Answer: Macronutrients

14 UV radiation sterilizes by causing damage to _____ in cells.

Answer: DNA

15 _____ culture contains a single species of microorganisms.

Answer: Pure

16 _____ is used for culturing anaerobic bacteria.

Answer: Anaerobic jar / candle jar

17 Measurement of bacterial cell number is called _____.

Answer: Enumeration

18 Chemical agents used for sterilization are called _____.

Answer: Disinfectants / antiseptics

9In _____ cultures, all cells divide at the same time.

Answer: Synchronous

10 Viruses require _____ cells for growth.

Answer: Living host cells

III. Descriptive questions

1. WHAT IS MICROSCOPY ? AND WRITE ABOUT BRIGHT AND DARK FIELD MICROSCOPE
2. WRITE GENERAL CHARACTERISTICS OF BACTERIA
3. WRITE METHODS OF STERILIZATION
4. WRITE ABOUT BACTERIAL GROWTH CURVE
5. WRITE ABOUT PURE CULTURE & ITS CHARACTERISTICS