# P. P. SAVANI UNIVERSITY

**Second Semester of B.Sc. Examination**

**December-2021**

**SSMB1050–Fundamentals of Bacteriology II**

**27.12.2021, Monday** **Time: 09:00 a.m. to 11:30 a.m.** **Maximum Marks: 60**

***Instructions:***

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

## Section-I (Total Marks - 30)

**Q.1 Short Questions** **[10]**

**1.1 Objectives** **[05]**

**1.1a** To increase bacterial number..... Is required

- **A** Nutrients
- **B** Optimum environment
- **C** DNA replication
- **D** All of the above

**1.1b** Beer Lambert's law explains the relationship between

- **A** Solute concentration & Absorbance and path length
- **B** Absorbance & solute concentration and path length
- **C** Path length & solute concentration and Absorbance
- **D** None of the above

**1.1c** The spectrophotometer is used for measuring

- **A** Concentration
- **B** Bacterial population
- **C** Turbidity of broth
- **D** All of the above

**1.1d** The bacterial population increase in

- **A** Lag phase
- **B** Log phase
- **C** Stationary phase
- **D** Decline phase

**1.1e** The anaerobic bacteria cannot grow in presence of

- **A** High temperature
- **B** Low pH
- **C** High pressure
- **D** Oxygen

**1.1f** In which of the culture, the bacterial growth can be regulated by the limited

supply of nutrients

A Batch culture
B Turbidostat
C Chemostat
D None of the above

**1.1g** ..... is/are the term relevant to bacterial growth

A Increase in size
B Increase in number
C Binary fission
D All of the above

**1.1h** Recombination in bacteria could be observed because of

A Asexual reproduction
B Sexual reproduction
C Vertical gene transfer
D Horizontal gene transfer

**1.1i** Death phase is observed in

A Turbidostat
B Chemostat
C Continuous culture
D Batch culture

**1.1j** For binary fission..... Protein is required

A FtsW
B FtsX
C FtsY
D FtsZ

**1.2 Answer the Following:** **[05]**

**1.2a** Batch culture shows peculiar bacterial growth curve (True/False)
**1.2b** Antibiotics are produced in ..... type of culture
**1.2c** Define bacterial growth.
**1.2d** On which principle, spectrophotometer works?
**1.2e** Name any method of horizontal gene transfer.

**Q.2 Short Notes (Attempt any two)** **[06]**

A What is Binary fission?
B What is bacterial cell cycle?
C Draw different phases of bacterial growth curve and label it.

**Q.3 Explain in detail (Attempt any two)** **[14]**

A Explain different phases of bacterial growth curve in detail.
B What is turbidity? Explain the principle of the instrument used for measuring it.
C Discuss methods of continuous culture.

## Section-II (Total Marks - 30)

**Q.1 Short Questions** [10]

**1.1 Objectives** [05]

**1.1a** Following factor/s affect the bacterial growth

**A** pH
**B** Temperature
**C** Nutrients
**D** All of the above

**1.1b** Chemotaxis is

**A** Motility due to chemical
**B** Motility due to oxygen
**C** Motility due to pressure
**D** Motility due to light

**1.1c** If a bacterium multiplies 4 times, then total number of bacteria would be

**A** 2
**B** 4
**C** 16
**D** 32

**1.1d** Archea are

**A** Psychrophiles
**B** Psychrotrophs
**C** Mesophiles
**D** Hyperthermophiles

**1.1e** The optimum temperature is required for

**A** DNA replication
**B** Enzyme catalysis
**C** Maintaining the cell organelles
**D** All of the above

**1.1f** When flagella moves in anticlockwise direction bacteria

**A** Run
**B** Tumble
**C** Run and tumble
**D** Swim

**1.1g** L, P, S, and M rings are present in

**A** Gram positive bacteria
**B** Gram negative bacteria
**C** Fungi
**D** Algae

**1.1h** Taq polymerase is isolated from

**A** Algae
**B** Fungi
**C** Meosphiles
**D** Extremophiles

**1.1i** Peritrichous bacteria have

**A** One flagella at one end
**B** One flagella at both ends
**C** Many flagella present at one end
**D** Flagella present across the surface

**1.1j** Bacteria that grows between 0 to 15°C are called as

**A** Psychrophiles
**B** Psychrotrophs
**C** Mesophiles
**D** Hyperthermophiles

**1.2 Answer the Following:** **[05]**

**1.2a** Extremophiles can resist high temperature (True/False)
**1.2b** Aerobic bacteria needs oxygen for .....
**1.2c** Define bacterial motility
**1.2d** Chemoreceptors are found on ..... of bacteria
**1.2e** CheY protein is involved in motility (True/False)

**Q.2 Short Notes (Attempt any two)** **[06]**

**A** Explain the classification of bacteria based on oxygen requirement.
**B** Draw the structure of flagella
**C** Explain classification on the basis of pH.

**Q.3 Explain in detail (Attempt any two)** **[14]**

**A** Discuss the structure of flagella in detail.
**B** Do you think that bacteria needs environmental factor for its growth? Justify your answer.
**C** Define Chemotaxis and explain why flagella are called as motility organelle?