P. P. SAVANI UNIVERSITY

Fifth Semester of B.Sc. Examination
December-2021
SSBT3190–Microbial Biotechnology-I

14.12.2021, Tuesday **Time: 12:30 p.m. to 03:00 p.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 A method that kills/inactivates all forms of life including vegetative cells, endospores, viruses, prions will be known as

- **A** Sterilization
- **B** Disinfection
- **C** Sanitization
- **D** Pasteurization

1.1b Technique used to control microbial growth on inanimate surfaces is

- **A** Sterilization
- **B** Disinfection
- **C** Sanitization
- **D** Tyndallization

1.1c Autoclaves are generally operated under which of the following temperature-time regime?

- **A** 121°C and 5 psi
- **B** 121°C and 15 psi
- **C** 110°C and 15 psi
- **D** 140°C and 20 psi

1.1d The decimal reduction time refers to the amount of time it takes to

- **A** Reduce the microbial population by 1%
- **B** Reduce the microbial population by 10%
- **C** Reduce the microbial population by 50%
- **D** Reduce the microbial population by 90%

1.1e The organism known as "Brewer's yeast" is

- **A** *Saccharomyces ludwigi*
- **B** *Saccharomyces boulardii*
- **C** *Saccharomyces pombe*
- **D** *Saccharomyces cerevisiae*

1.1f Glucose oxidase is obtained from

A Saccharomyces cerevisiae
B Aspergillus niger
C Spirulina
D Penicillium sp.

1.1g SCP Quron™ contains mycoprotein from which of the following organism

A *Saccharomyces cerevisiae*
B *Escherichia coli*
C *Spirulina*
D *Fusarium venenatum*

1.1h During which stage of growth microorganism synthesize secondary metabolites?

A Lag phase
B Exponential phase
C Stationary phase
D Death phase

1.1i What is meant by "Quasi steady state"?

A Cell concentration remains virtually constant
B Cell concentration is variable
C Total biomass remains constant with time
D Product remains constant with time

1.1j A continuous culture is a/an

A Open culture system
B Closed culture system
C Synchronous culture system
D Semi-closed culture system

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) **[05]**

1.2a What are primary metabolites? Give an example.
1.2b Which technique is can be utilized for sterilization of heat sensitive liquids?
1.2c What is feedback inhibition?
1.2d Name a technique used to screen antibiotic producing microorganisms?
1.2e Name the scientist who developed pure culture technique?

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

A Sterilization of air in industries
B Continuous culture technique
C Importance of log phase

Q.3 Explain in detail (Attempt any two) [1

A Industrial importance of fungi.

B Screening of industrially important microorganisms

C Industrially application of bacteria.

Section-II (Total Marks - 30)

Q.1 Short Questions [10

1.1 Objectives [

1.1a Mutant with defect in one of the biosynthetic pathways is called

- **A** Auxotroph
- **B** Prototroph
- **C** Revertant
- **D** Feedback insensitive mutant

1.1b Mutant selection is which type of screening?

- **A** Primary
- **B** Secondary
- **C** Tertiary
- **D** Quaternary

1.1c Parasexual cycle is used to improve

- **A** Bacteria
- **B** Fungi
- **C** Algae
- **D** Protozoa

1.1d A cell without cell wall is known as

- **A** Protoplast
- **B** Tonoplast
- **C** Chloroplast
- **D** Ghost cell

1.1e Following is example of cryoprotectant except

- **A** DMSO
- **B** Glycerol
- **C** PEG
- **D** Paraffin oil

1.1f Liquid nitrogen has a temperature of

- **A** +196
- **B** -196
- **C** +80
- **D** -80

1.1g Which of the following not a chemical mutagen?

A Acridine orange
B Ethidium bromide
C 5-bromouracil
D Polyethylene glycol

1.1h Preservation by refrigeration has following disadvantages
A Spontaneous mutations
B Cumbersome
C Chance of contamination
D All of the above

1.1i Sexual reproduction in bacteria can be achieved by
A Conjugation
B Transformation
C Transduction
D Mutation

1.1j Which of the following mutations has most deleterious effect on growth of microorganisms?
A Frameshift
B Missense
C Point
D Gene duplication

1.2 Answer the Following: (MCQ/Short Question/Fill in the Blanks) **[05]**

1.2a Parasexual cycle is found in _____.
1.2b What is a mutagen?
1.2c The first licensed drug produced using rDNA technology was _____.
1.2d Analogue resistant mutants have feedback insensitive enzymes. (True/False)
1.2e Spore forming microorganisms can be preserved in sterile _____.

Q.2 Short Notes (Attempt any two)
A What is strain improvement? Enlist the methods used for strain improvement.
B Differentiate between spontaneous mutation and induced mutation.
C Quality control of preserved stocks.

Q.3 Explain in detail (Attempt any two) **[14]**
A Strain improvement by recombination method.
B Preservation of microorganisms at low temperature.
C Lyophilization technique.