P. P. SAVANI UNIVERSITY

Fifth Semester of B.Sc. Examination
December-2021
SSMB3130–Industrial Microbiology-I

14.12.2021, Tuesday **Time: 12:30 p.m. to 3:00 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 Typical aeration rates for aerobic fermentation are

- **A** 0.5 – 1.0 vvm
- **B** 1.0 – 1.5 vvm
- **C** 1.5 – 2.0 vvm
- **D** 0- 0.5 vvm

1.1b Single cells are smaller than gas bubbles?

- **A** True
- **B** False
- **C** Can't say
- **D** depends of cell

1.1c Which type of microbes grow well in the condition of enriched oxygen?

- **A** Obligates aerobes
- **B** Obligates anaerobes
- **C** Facultative anaerobes
- **D** Microaerophilic

1.1d The least yield of ATP is observed in

- **A** aerobic respiration
- **B** anaerobic respiration
- **C** fermentation
- **D** dialysis

1.1e Co_2, Wine & beer are produce by

- **A** aerobic respiration
- **B** anaerobic respiration
- **C** microaerophilic organisms
- **D** All

1.1f Which of the following is not a nitrogen source

- **A** Waste liquor
- **B** Corn Steep
- **C** Yeast Extract
- **D** Peptone

1.1g Which of the following is not the constituent of pharmamedia?

A Calcium
B Valine
C Riboflavine
D Fluorineid

1.1h Which of the following is a defined media?

A Synthetic media
B Crude media
C Simple media
D Complex media

1.1i What is the basic principle of Industrial Microbiology?

A To provide optimum growth condition
B To provide aseptic condition
C To produce a pure product
D To create pure form of media

1.1j Crude media is an undefined media

A True
B False
C Depends of environment
D Depends on pH

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

1.2a Pasteurization work from _____ to _____ temperature.

1.2b The word fermentation derived from Greek word_____.

1.2c What is sublimation?

1.2d What is orifice?

1.2e _____ is going to prevent formation of vortex.

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

A Compare & Contrast Batch & Continuous Fermentation

B Enlist major historical development in fermentation.

C Enlist a type of carbon source and their mode of action in media.

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

A Define Fermentation. Explain various types of fermentation.

B What is Kinetics? Write a note on Microbial growth kinetics.

C Define Upstream Process. Enlist different stages and importance of each.

Section-II (Total Marks - 30)

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

1.1 **Objectives** [05]

1.1a Which of the following fermenter is used vinegar production

- **A** Airlift
- **B** Cyclone column
- **C** Packed tower
- **D** None

1.1b Scale up of fermentation process requires that

- **A** Small and large vessel dimensions must be similar
- **B** Small and large vessel dimensions must be different
- **C** Vessel dimensions do not matter
- **D** Different vessels are not used

1.1c Aeration-agitation system includes

- **A** Impellers
- **B** Baffels
- **C** Spargers
- **D** All of the above

1.1d Role of sparger is to

- **A** Introduce air
- **B** Remove air
- **C** Mix air
- **D** Compress air

1.1e Design of fermenter must include

- **A** Temperature and pH control
- **B** Inoculation and sampling port
- **C** Aeration agitation system
- **D** Bothe A & B

1.1f Following are required for growth of bacteria except

- **A** Carbon
- **B** Nitrogen
- **C** Antifoaming agent
- **D** Vitamins

1.1g Micronutrients are those that are required in

- **A** High quantities
- **B** Low quantities
- **C** Negligible quantities
- **D** Not required

1.1h Which one of the following is cheap source of nitrogen?

- **A** Corn steep liquor
- **B** Soybean meal
- **C** Ammonium nitrate
- **D** Ammonium sulphate

1.1i Microorganisms take energy form

A Reduced substrate
B Oxidized substrate
C Acidic substrate
D Alkaline substrate

1.1j Following is an example of antifoam except

A Alcohols
B Fatty acids
C Silicones
D Proteins

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

1.2a What are precursors?

1.2b Agitators are also known as _____.

1.2c Baffels cover $1/10^{th}$ of the vessel volume. (True/False)

1.2d Foaming never creates problem during microbial growth. (True/False)

1.2e What is the role buffer in fermentation media?

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

A Significance of aeration-agitation system.
B Criteria for medium formulation.
C Components of a typical growth medium.

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

A Airlift fermenter.
B Components of aeration agitation system.
C What are antifoaming agents? Enlist the ideal properties of antifoams.