

D-7336

M.Sc. (IIIrd Semester) Examination, 2020

BIOTECHNOLOGY

(Bioprocess Engineering)

Time Allowed : Three Hours

Maximum Marks : 70

SECTION - A

Note : Attempt any ten questions. Each question carries one mark. **1×10=10**

Q. 1. Objective Type Questions :

- (i) The art of continuously improving the performance of microbial strains for industrial applications is referred to as _____.
- (ii) _____ gas is commonly used to sterilize objects that are sensitive to temperature.

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(2)

- (iii) Lag phase is also known as _____.
- (iv) In a fermenter the top portion left without broth is called _____.
- (v) _____ prevents sedimentation on side and aids in proper mixing.
- (vi) Inhibitors helps in increasing the yield of desirable products (State true or false) _____.
- (vii) Which method is used to separate compounds on the basis of their relative solubilities in two different immiscible liquids ?
 - (a) Filtration
 - (b) Liquid-Liquid extraction
 - (c) Centrifugation
 - (d) Chromatography

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(viii) The part of fermenter useful for thorough

mixing of medium and inoculum is :

- (a) Shaft
- (b) Valve
- (c) Impeller
- (d) Sparger

(ix) Which of the following operations does not come under upstream processing ?

- (a) Media preparation
- (b) Inoculum development
- (c) Effluent treatment
- (d) Storage of raw material

(x) Substrate used by microorganisms to produce single-cell proteins includes :

- (a) Methane Gas
- (b) Industrial Waste

(4)

(c) Agricultural Waste

(d) All of the above

(xi) Which of the following is not a physical method of immobilization ?

- (a) Adsorption
- (b) Entrapment
- (c) Micro encapsulation
- (d) None of these

(xii) Which of the following is microalgae that has been consumed for centuries due to its high nutritional value ?

- (a) Arthrospira platensis
- (b) Lactobacillus
- (c) Saccharomyces cerevisiae
- (d) Aspergillus niger

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SECTION - B

Note : Attempt any five questions. Each question carries
2 marks. **5×2=10**

Q. 2. Very Short Answer Type (25-30 words) :

- (i) Define fermentation.
- (ii) Define precipitation.
- (iii) What is a bioreactor ?
- (iv) What are precursors ?
- (v) What are growth linked products ?
- (vi) Name any two types of agitators used for mixing.
- (vii) Give any two advantages of immobilized enzymes.

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SECTION - C

Note : Attempt any five questions. Each question carries
4 marks. **5×4=20**

Q. 3. Short Answer Type (250 words) :

- (i) Explain the role of gel permeation chromatography in product recovery.
- (ii) Differentiate between fixed volume and variable volume fed-batch culture.
- (iii) Describe the role of vitamins & growth factors in fermentation medium.
- (iv) Discuss the measurement and control of temperature within a bioreactor.
- (v) Give an account of biosensors.
- (vi) Discuss industrial production of penicillin.

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(7)

(vii) Discuss the applications of fermentation technology.

SECTION - D

Note : Attempt any three questions. Each question carries 10 marks. **3×10=30**

Q. 4. Essay Type (more than 500 words) :

- (i) Give a detailed account on effluent treatment.
- (ii) Describe kinetics of microbial growth in a batch culture.
- (iii) Explain industrial production of ethanol in detail.
- (iv) Give an account on basic component and design of bioreactor.