Printed Pages – 7

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 in referred to as _____.

(ii) _____ gas is commonly used to sterilize objects that are sensitive to temperature.

(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

(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.

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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(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.

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