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E-6831

M.Sc. (IIIrd Semester) Examination, 2021

MICROBIOLOGY

(Industrial Microbiology)

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 :

(a) In fermenter the top portion left without broth is called _____.

(b) Primary screening detects _____.

(c) The phase in the active growth of a culture in which primary metabolites are formed _____.

(d) Microbial process is advantageouss than chemical process (T / F).

(e) Molasses and corn steep liquor are usually used as _____.

(f) Which of the following product utilizes what as its raw material ?

(i) Lactic acid

(ii) Acetic acid

(iii) Glutamic acid

(iv) Lysine

(g) A centrifuge is used to separate molecules on the basis of their :

(i) Size

(ii) Shape

(iii) Density

(iv) All of the above

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(h) Which of the amino acid was produced by immobilized enzyme for the first time ?

(i) L - amino acids

(ii) D - amino acids

(iii) D and L amino acids

(iv) None of the above

(i) A bioreactor to which fresh medium is continuously added, while culture liquid containing leftover nutrients, metabolic end products and microorganisms are continuously removed at the same rate is called :

(i) Cryostat

(ii) Chemostat

(iii) Fed-batch fermenter

(iv) Continuous fermenter

(j) Which of the following is not an upstream process ?

(i) Media formulation

(ii) Sterilization of media

(iii) Screening

(iv) Product recovery

(k) Microbes improved in industry for :

(i) Better product

(ii) High yield

(iii) Stability of Organisms

(iv) All of the above

(l) Bubble column reactor can not be used for :

(i) Highly viscous medium

(ii) Low viscous medium

(iii) Solid state medium

(iv) Liquid state medium

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SECTION - B

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

Q. 2. Very short answer type (25-30 words) :

(a) What is turbidostat ?

(b) Name any two microorganisms used for industrial production of antibiotics.

(c) Which technique is mostly used for the improvement of organisms for primary metabolites ?

(d) What are immobilized enzymes ?

(e) What is medium optimisation ?

(f) Enlist the microorganisms used in large scale production of enzymes.

(g) Compare solid state and submerged fermentations.

SECTION - C

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

Q. 3. Short answer type (250 words) :

(a) What are different methods of chromatography available for purification of biomolecules.

(b) Describe screening methods for amino acid producing microorganisms.

(c) Describe the design of stirred tank bioreactor.

(d) Differentiate between batch and continuous fermentation.

(e) What media is used for vitamin B12 production ?

(f) How rDNA technology is used for strain improvement ?

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(g) Mention the importance of $K_L a$ in a fermentation process.

SECTION - D

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

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

(a) Explain lactic acid fermentation. Add a note on advantage of lactic acid fermentation.

(b) Write a note on various strain improvement methods.

(c) Explain in detail the process for production of L-lysine.

(d) Give an account on working principle and applications of submerged fermentations.

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