BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – B.Sc.(BT)-Hons-2022
Course Name – Bioprocess Technology
Course Code - BBTC503
(Semester V)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) The term "Trophophase" associates with _____.
   a) Production of waste materials
   b) Production of topical products
   c) Production of primary metabolites
   d) Production of secondary metabolites

(ii) Identify the phase of the growth curve when the cellular growth rate increases.
   a) Lag phase
   b) Log phase
   c) Stationary phase
   d) Deceleration phase

(iii) The Fed-Batch culture model is a _____ system.
   a) Open
   b) Closed
   c) Isolated
   d) semi-Open

(iv) Select which one is not a parameter for making a culture media.
   a) It should be able to produce the maximum yield of product
   b) It should be able to produce the maximum concentration of product
   c) It should be easily sterilized.
   d) It should permit the maximum rate of product formation, no matter how costly it is

(v) Select the one that is not a Carbon source.
   a) Blackstrap molasses
   b) Corn molasses
   c) Beet molasses
   d) Yeast extract

(vi) Select the organism who can not produce secondary metabolites.
   a) Filamentous fungi
   b) Filamentous bacteria
   c) Sporing bacteria
   d) Enterobacteria

(vii) What kind of production involves Grapes.
   a) beer
   b) wine

c) vodka d) None

(viii) Select the upstream process.

a) Product recovery b) Product purification
c) Media formulation d) Cell lysis

(ix) Select the one that is not present in fermentation media?

a) Carbon b) Nitrogen
c) Agar d) Water

(x) Relate the fundamental of Industrial Microbiology with____

a) To provide optimum growth conditions b) To provide aseptic conditions
c) To produce a pure product d) To create a pure form of media

(xi) Employ the operational condition of a biochemical plant___

a) Metallic catalyst b) Chemical catalyst
c) Elevated temperature d) Non-pathologic state of the organism

(xii) Indicate which of the mentioned separation process is NOT involved in manufacturing process of citric acid ?

a) Ultrafiltration b) Ion-exchange
c) Crystallization d) Distillation

(xiii) Choose the correct statement about enzyme____

a) An Enzyme is a protein and is used as a catalyst to accelerate the reaction. b) Life would not exist without the presence of enzymes.
c) Enzymes participate in cellular metabolic processes. d) All of these

(xiv) Choose an enzyme that is used for the production of cheese in industry and also derived from the stomach of young ruminant animal.

a) Trypsin b) Pepsin
c) Liginase d) Rennin

(xv) Choose an enzyme involved in fat digestion.

a) Lipase b) Sucrase
c) Maltase d) Fructose

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Differentiate submerged and solid-state fermenter. (3)
3. Articulate the enzyme immobilization process and its application in Bioprocess Technology (3)
4. Recall the controlling processes that are important for optimization of fermentation? (3)
5. Describe Turbidostat. (3)
6. Analyze the Principle of Fluidized bed fermenter and its application. (3)

OR

Illustrate the term DOE and mass transfer coefficient. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Identify the major components of fermentation technology and write briefly about them (5)
8. Illustrated production of lactic acid by fermentation. (5)
9. Summarize activated sludge techniques. (5)
10. Classify Rotary Drum Vacuum Filters and Membrane Filters (5)

11. Interprete the role of sensors and instrumentation in monitoring and controlling bioprocesses. Provide examples of specific sensors used for measuring variables like pH, temperature, and dissolved oxygen (5)
12. Define the Effects of Physicochemical Properties of the Medium in Oxygen Mass Transfer (5)

OR

Evaluate single cell protein and draw a flow diagram for the production of single cell protein from carbohydrate (5)

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