BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – B.Sc.(BT)-Hons-2022
Course Name – Industrial Fermentations
Course Code - BBTS402B
(Semester IV)

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) Interpret in a batch fermentor, pH control is achieved by

a) A water jacket b) An autotitrator
c) An impeller d) A blade

(ii) Recall which of the following is not a cereal?

a) Wheat b) Tapioca
c) Maize d) Millets

(iii) Identify which field does industrial microbiology showcase potential for environmentally friendly solutions, using microorganisms to clean up pollutants and contaminants.

a) Agriculture b) Bioremediation
c) Aerospace d) Mining

(iv) Select which of the following allows researchers to optimize metabolic pathways in microorganisms for efficient production of desired compounds in industrial microbiology.

a) Bioremediation b) Systems Biology
c) Genetic Engineering d) Fermentation

(v) Explain during alcoholic fermentation, pyruvic acid is first converted to.....

a) Ethyl alcohol b) Succinic acid
c) Acetaldehyde d) Oxaloacetic acid

(vi) Interpret the fermentation media is generally

a) Sourced from byproducts or waste products of other industries b) Of laboratory grade to be suitable for fermentation
c) Not readily available in the market and therefore influences overall cost of production d) Devoid of carbon and Nitrogen sources

(vii) Determine that For industrial purposes, acetone and butanol solvents are produced using which organism?

a) E.coli
b) Clostridium
c) Saccharomyces
d) Pseudomonas

(viii) Explain the full form of DO

a) Developed Oxygen
b) Diffusion Oxygen
c) Dissolved Oxygen
d) Dissolved Orbital

(ix) Select where microbial enzymes find their uses

a) Food processing
b) Textile manufacturing
c) Detergent production
d) All of these

(x) Use of microorganisms for removing pollutants is named as

a) Bioindicators
b) Bioremediation
c) Biosensors
d) None of these

(xi) Which of the following will you employ as biological fertilizer

a) E. coli
b) Rhizobium
c) Yeast
d) All of these

(xii) Identify the phase where accumulation of toxic chemicals and depletion of nutrients take place

a) Log phase
b) Stationary phase
c) Death phase
d) None of these

(xiii) Identify the process which has increased productivity

a) Batch process
b) Continuous process
c) Fermentation process
d) Wine making

(xiv) Identify the group of microorganisms which produce antibiotics

a) Protozoa
b) Algae
c) Molds
d) None of these

(xv) Chose the group of microorganisms used for ABE fermentation

a) Amoeba
b) Clostridia
c) Paramecium
d) Yeast

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Determine how you can produce acetic acid from ethanol? (3)
3. Discuss the significant historical milestones and developments that have shaped the field of industrial microbiology. (3)
4. Write three main areas of upstream processing (3)
5. Identify the two main types of filters that is used for filtration in industrial microbiology (3)
6. Calculate the mathematical derivation of a Batch Fermentation (3)

OR

Calculate the mathematical derivations of a continuous fermentation (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain in details the product generation of ethanol by fermentation (5)
8. Deduce the microbial growth kinetics. (5)
9. Assess the three types of fermentation based on the end products obtained from pyruvate (5)
10. Explain the steps involved in starch conversion processes during fermentation, (5)
11. Describe how a microbial fuel cell can be designed for efficient energy generation using microbial processes (5)

12. Estimate what are some of the inorganic materials that can be used for immobilization support (5)

OR

Evaluate in details the three types of fermentation(Koji process,surface culture and submerged process) for the production of citric acid (5)

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