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# BRAINWARE UNIVERSITY

## Term End Examination 2023
## Programme – B.Sc.(BT)-Hons-2020/B.Sc.(BT)-Hons-2021
## Course Name – Industrial Fermentations
## Course Code - BBTS401B
## ( 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) What is downstream processing?
- a) The production of genetically engineered microorganisms
- b) The isolation and purification of desired products in bioprocess technology
- c) The use of various techniques and methodologies in bioprocess technology
- d) The recovery of secreted products from the cell

(ii) Which of the following is target microbe in commercial sterilization?
- a) Pseudomonas aeruginosa
- b) Bacillus anthracis
- c) Salmonella typhi
- d) Clostridium botulinum

(iii) The parameters of steam sterilization are:
- a) Steam under pressure, time, and temperature
- b) Time, temperature, and concentration
- c) Temperature, time, and humidity
- d) Temperature, time, concentration and humidity

(iv) The Batch culture is a/an _____ culture system.
- a) Open
- b) Closed
- c) Isolated
- d) Semi-closed

(v) A period during which the growth rate of cells gradually increases is known as _____
- a) Log phase
- b) Death phase
- c) Lag phase
- d) Stationary phase

(vi) The Continuous culture is a/an _____ culture system.
- a) Closed
- b) Open
- c) Isolated
- d) Semi-closed

(vii) What factors influence cell breakage during the physical methods of cell disruption?
- a) Size and quantity of metal beads, incubation time and pressure
- b) Size and quantity of glass beads, concentration and age of cells, temperature and agitator speed
- c) Amount of ultrasonication, type of cell, method of grinding
- d) Color and texture of cells, pH and salinity

(viii) Propionic acid produced by

a) Lactobacillus
b) Staphylococcus
c) Propionibacterium
d) Bacillus

(ix) What is the starting point for testing antibiotic producing organisms?

a) Using toxic analogues of the material where utilization is being sought
b) Testing microbial metabolites for bioactive activity
c) Placing a soil suspension or soil particles on agar seeded with the test organism(s)
d) Incubating the toxic analogue with soil

(x) Lactose- hydrolyzed milk and whey produced in diary industry using which enzyme?

a) Lactate transferase
b) Lactate dehydrogenase
c) β-galactosidase
d) Glucose oxidase

(xi) Which of the following organism produce alkaline protease?

a) Bacillus cereus
b) Bacillus subtilis
c) Mucorbacilliformis
d) Bacillus licheniformis

(xii) The enzyme purified from pineapple is known as

a) Pinase
b) Bromelain
c) Pepsinogen
d) Papain

(xiii) Which one of this is not an example of secondary metabolite?

a) Gibberellic acid
b) Actinomycin
c) Polysaccharides
d) Alkaloids

(xiv) The permeability barrier cannot altered by

a) Fatty acid derivative
b) Penicillin
c) Streptomycin
d) Biotin deficiency

(xv) 5-bromouracil is the structural analog of which nitrogenous base

a) Adenine
b) Thymine
c) Guanine
d) Cytosine

## Group-B

(Short Answer Type Questions) 3 x 5=15

2. Why moist heat sterilization is preferred over dry heat? (3)
3. How does autoclave sterilization work? (3)
4. Classify 3 types of airlift bioreactor (3)
5. Schematically represent the diversity of biodiesel producing microalgae. (3)
6. Define immobilization and give one example each from natural, synthetic and inorganic polymer. (3)

**OR**

Differentiate between primary and secondary metabolites. (3)

## Group-C

(Long Answer Type Questions) 5 x 6=30

7. Illustrate the two general procedures for manipulating the genome of industrial organisms for strain improvement. (5)
8. Name 5 microbial polysaccharides, the microbes from which they are extracted and its one application (5)
9. Classify and explain the different biological processes of biohydrogen production. (5)
10. Organize and discuss the monitoring parameters used for checking the biomass levels (5)
11. Evaluate what are the advantages of using enzymatic cell disruption methods over other methods? (5)

12. Devise a method to recover and screen amylase after fermentation? Why is screening of amylase necessary after industrial production? (5)

**OR**

Design a scheme for the pilot scale production of ethanol production from sugarcane. (5)

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