JV-003-001517 Seat No. _____

B. Sc. (Sem. V) (CBCS) Examination

October - 2019

Biotechnology

BT - 501 : Bioprocess and Biochemical Engineering

(Old Course)

Faculty Code : 003

Subject Code : 001517

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 Short answer questions : **20×1**

(1) Transfer of foreign DNA into bacteria is known as _____.

(2) Mutagenesis occurs at a specific site of DNA is called _____.

(3) A mutant organism that requires a particular additional nutrient which the normal strain does not is called auxotrophs. (True/False)

(4) Principle of cryopreservation is based on sublimation and storage at –20°C. (True/False)

(5) A batch culture fermentation was being conducted with Streptomyces griseus. Analysis of samples collected indicated doubling of cell number per unit time. Which phase is associated with doubling of cell number?

(6) Which system is applicable to measure temperature in fermentor?

(7) _____ culture operation achieves steady state condition.

(8) Write the name of any one fermentor which is working on the principal of immobilization.

(9) The growth medium in which all of the chemical components are known is medium.

(10) Write the name of carbon source which is derived from milk processing industry.

(11) Which statistical optimization process is used for determine the optimum level of each independent variables?

(12) Expand the term HEPA filter.

(13) Membrane filter is absolute filter. (True/False)

(14) Organic solvents can be separated from aqueous media by distillation. This is because organic solvents have different _____ than water.
(15) The process Of separating the component from a liquid mixture by selective evaporation and condensation is known as _____.
(16) Which cell disruption method is based on cavitation?
(17) Which immobilization method involves immobilization of cell in alginate beads?
(18) Which yeast is commercially used for 'alcohol production?
(19) Which blue green algae contain highest amount of protein and acts as single cell protein?
(20) Which fermentation product is produced by Propionibacterium shermanii?

2 (A) Answer any **three** out of six : **3×2**

(a) Define Chemotrophs.
(b) Define enrichment culture.
(c) What is feedback control?
(d) Define secondary metabolites.
(e) What is auxanography?
(f) What is fed batch culture?

(B) Answer any **three** out of six : **3×3**

(a) Write down the importance of starter culture.
(b) Differentiate between Primary and Secondary metabolites.
(c) Write down methods of isolation of auxotroph in brief.
(d) What is meant by "Continuous culture operation"?
(e) Differentiate between continuous and batch sterilization.
(f) How heat is controlled during fermentation process?

(C) Answer any **two** out of five : **2×5**

(a) What is recombinant DNA technology? How to improve strain using recombinant DNA technology?
(b) With the help of diagram explain any two fermentors.
(c) Give a brief account of growth kinetics of microbial cell in a batch system.

(d) Write down the carbon sources utilized as raw material in fermentation industry.

(e) What is oxygen transfer rate (OTR)? How Kla value can be determine?

3 (A) Answer any **three** out of six : **3×2**

(a) What is the principle of membrane filter?

(b) Define centrifugation.

(c) What is the relationship between filtration rate and applied pressure?

(d) Define crystallization.

(e) Define reverse osmosis.

(f) Write down the biochemical pathway for ethanol production in yeast cells.

(B) Answer any **three** out of six : **3×3**

(a) Write down the name of methods for air sterilization. How air is supplied to fermentor?

(b) Write short notes on application of citric acid.

(c) Write down the working principle of spray drier.

(d) Write down the principle and application of affinity chromatography.

(e) Briefly describe overview of down stream processing.

(f) Write down the principle and application of solvent extraction.

(C) Answer any **two** out of five : **2×5**

(1) Define media optimization. Explain statistical media optimization process in brief.

(b) Write down the methods of cell disruption.

(c) Write short notes on solid state fermentation.

(d) What do you mean by 'immobilization of enzymes? DISCUSS the application of immobilized enzymes.

(e) Describe various strategy to make fermentation process economical.
