

B.Sc. Semester - 5 (CBCS) Examination

Oct/Nov. - 2018

BIOPROCESS AND BIOCHEMICAL ENGINEERING (CORE)

Time: 2:30 Hours

Marks: 70

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que-1 (A) Answer the following. (Any one out of Two) (07)
- (1) What is recombinant DNA technology? How to improve strain using recombinant DNA technology?
 - (2) What are auxotrophs? Write down the methods for isolation of auxotrophic mutants.
- (B) Attempt any One. (Out of Two) (04)
- (1) Explain lyophilization process in brief.
 - (2) Differentiate between primary and secondary screening.
- (C) Attempt any Three. (Out of Five) (03)
- (1) A mutant organism that requires a particular additional nutrient which the normal strain does not is called auxotrophs. (True/False)
 - (2) _____ Substance is regenerated by fermentation process under anaerobic condition.
 - (3) Define Transformation.
 - (4) _____ is used for cryopreservation whose temperature is - 196°C?
 - (5) Define Plasmid.
- Que-2 (A) Answer the following. (Any one out of Two) (07)
- (1) With the help of diagram explain the basic design of fermentor.
 - (2) Give a brief account of growth kinetics of microbial cell in a batch system.
- (B) Attempt any One. (Out of Two) (04)
- (1) What is oxygen transfer rate. (OTR)? Write down the mechanism of OTR during fermentation process.
 - (2) Write down the importance of starter culture.
- (C) Attempt any Three. (Out of Five) (03)
- (1) Which phase is associated with doubling of cell number in batch culture?
 - (2) Which system is incorporated in fermentor to prevent vortex mixing of air?
 - (3) _____ is applicable to provide air inside fermentor.
 - (4) During _____ culture operation, limiting substrate is fed to the bioreactor and products remain in the bioreactor until the end of the run.
 - (5) Define turbidostat.
- Que-3 (A) Answer the following. (Any one out of Two) (07)
- (1) Write down the carbon sources utilized as raw material in fermentation industry.
 - (2) What is media optimization? Explain statistical media optimization process in brief.

- (B) Attempt any One. (Out of Two) (04)
- (1) Differentiate between continuous and batch sterilization.
 - (2) Write down the application of computer in automation control.
- (C) Attempt any Three. (Out of Five) (03)
- (1) What is complex media?
 - (2) _____ design is used for selection of variable during statistical media optimization process.
 - (3) Which carbon source is derived from industrial effluent of paper industry?
 - (4) Autoclave is the example of continuous sterilization process. (True/False).
 - (5) Expand the term HEPA filter.
- Que-4 (A) Answer the following. (Any one out of Two) (07)
- (1) Write down the strategy to make fermentation process economical.
 - (2) Write down the mechanical and non-mechanical method of cell disruption.
- (B) Attempt any One. (Out of Two) (04)
- (1) Write down the principle and application of solvent solvent extraction.
 - (2) Write down the working principle of rotary drum drier.
- (C) Attempt any Three. (Out of Five) (03)
- (1) Membrane filter is example of absolute filter (True/False).
 - (2) The process of separating the component from a liquid mixture by selective evaporation and condensation is known as_____.
 - (3) Which chromatography process contains non-polar stationary phase material?
 - (4) What is crystallization?
 - (5) Which drier is used for heat sensitive materials?
- Que-5 (A) Answer the following. (Any one out of Two) (07)
- (1) Write down the fermentation condition and application of Citric acid.
 - (2) Briefly describe the various techniques of cell immobilization.
- (B) Attempt any One (Out of Two) (04)
- (1) What do you mean by ‘immobilization of enzymes? Discuss the application of immobilized enzymes.
 - (2) Write short note on solid state fermentation.
- (C) Attempt any Three. (Out of Five) (03)
- (1) Which fermentation process used substrate but do not involve submerge condition?
 - (2) Which microorganism is used for commercial produced of penicillin?
 - (3) Write down the name of any one gluconic acid producing fungi.
 - (4) Highest amount of protein is produced by _____, a blue green algae that acts as single cell protein.
 - (5) Which immobilization method involves immobilization of cell in alginate beads?