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Total No. of Pages : 02

Total No. of Questions : 11

M.Sc. Biotechnology (2018 Batch) (Sem.-2)

BIOPROCESS ENGINEERING

Subject Code : MBT-205

M.Code : 76249

Time : 3 Hrs.

Max. Marks : 70

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **SEVEN** questions carrying **SIX** marks each and students have to attempt any **FIVE** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A

1. Describe briefly :

- (a) Strain improvement
- (b) Lyophilization
- (c) Fed batch fermentation
- (d) Upstream processing vs. downstream processing
- (e) Pneumatic vs. hydrodynamic fermenters
- (f) Reverse osmosis
- (g) Sedimentation
- (h) Bacteriocins
- (i) Fermented beverages
- (j) Microbial colours

SECTION-B

2. Describe various strain improvement techniques used for increase in yield and other desired characteristics.
3. What is solid state fermentation? Describe factors affecting solid state fermentation.
4. What is solid-liquid extraction? Describe various methods used for the disruption of microbial cells.
5. Describe the food ingredients and additives prepared by fermentation.
6. Describe various chromatographic techniques used for the purification of microbial products.
7. Describe the microbial growth and death kinetics of an industrially important microorganism.
8. Describe the in-line and on-line control bioprocess parameters in bioreactors.

SECTION-C

9. Describe the production of bacteriocins from lactic acid bacteria. Also highlight their application in food preservation.
10. Describe the large scale animal and plant cell cultivation in bioreactors. Also highlight the problems faced in each case.
11. Describe briefly isolation, screening and maintenance of industrially important microbes.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.