

Seat No. : _____

AE-126

April-2023

B.Sc., Sem.-VI

CC-310 : Microbiology (Bioprocess Technology)

Time : 2½ Hours]

[Max. Marks : 70

- Instructions :**
- (1) All questions are compulsory.
 - (2) Figures on the right indicates marks.
 - (3) Mention correct question number against the answer.
 - (4) Draw figures wherever necessary.

1. Discuss in detail about mass transfer of oxygen and foam control during fermentation. **14**

OR

- (A) Explain in detail about submerged fermentation procedures. **7**
- (B) Elaborate on containment procedures during fermentation. **7**

2. Explain in detail about different centrifugation techniques used for removal of microbial cells and suspended solids. **14**

OR

- (A) Discuss in detail about physico-mechanical methods of cell disruption. **7**
- (B) Discuss in detail about liquid-liquid extraction methods as a part of downstream processing. **7**

3. Elaborate your views on fermentation economics. **14**

OR

- (A) Explain about sterility testing and its significance in fermentation technology. **7**
- (B) Discuss in detail about various chromatographic procedures for detection of fermentation products. **7**

4. Elaborate on details of all component parts of fermentative production of penicillin. **14**

OR

(A) Explain submerged fermentation for production of amylase. **7**

(B) Explain in detail about citric acid fermentation using *Aspergillus niger*. **7**

5. Give short and specific answers in 1-2 lines only : (any **seven**) **14**

(1) What is solid state fermentation ?

(2) What is cleanroom environment ?

(3) What is scale up ?

(4) What is tangential filtration ?

(5) Enlist two aerobic effluent treatment processes.

(6) What is application of reverse osmosis in fermentation ?

(7) Name any two physical methods for assaying fermentation product.

(8) Name the test organisms used for bioassay of penicillin and vitamin B12.

(9) What is LAL test ?

(10) Enlist two microbial species used in industrial production of alcohol.

(11) Give two applications of citric acid.

(12) Name at least two organisms involved in L-lysine production.