2025/FYUG/EVEN/SEM/
BTCDSC-252/180

FYUG Even Semester Exam., 2025

BIOTECHNOLOGY

(4th Semester)

Course No. : BTCDSC-252

(Bioprocess Technology)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

UNIT—I

1. Answer any *two* of the following questions : 2×2=4

(a) Define bioprocess technology.

(b) What is fed-batch culture?

(c) What is continuous culture?

2. Answer any *one* of the following questions : 10

(a) Write a detailed account on basic principle and components of fermentation technology. Add a note on applications of bioprocess technology. 7+3=10

(b) Write notes on : 5+5=10

(i) Batch culture

(ii) Phases of microbial growth

UNIT—II

3. Answer any *two* of the following questions : 2×2=4

(a) Define bioreactor.

(b) What is the function of agitator and sparger in a bioreactor?

(c) Write a note on packed tower bioreactor.

4. Answer any *one* of the following questions : 10

(a) Give a detailed account of the design and components of a bioprocess vessel.

(b) Write notes on : 5+5=10

(i) Airlift bioreactor

(ii) Cyclone column bioreactor

UNIT—III

5. Answer any *two* of the following questions : 2×2=4

(a) What is upstream processing?

(b) What is the basic composition of culture media?

(c) Write a note on pure culture.

6. Answer any *one* of the following questions : 10

(a) Give a detailed account of strain improvement. Add a note on sterilization. 6+4=10

(b) Write notes on : 5+5=10

(i) Inocula development

(ii) Media preparation

UNIT—IV

7. Answer any *two* of the following questions : 2×2=4

(a) Define mass transfer.

(b) Write about oxygen requirement in bioprocessing.

(c) What is kLa?

8. Answer any *one* of the following questions : 10

(a) Give an illustrated account of bioprocess measurement and control system.

(b) Write notes on : 5+5=10

(i) Factors affecting kLa

(ii) Computer-aided process control

UNIT—V

9. Answer any *two* of the following questions : 2×2=4

(a) What is product recovery?

(b) Write a note on solid-liquid separation.

(c) Write about industrial production of amylase.

10. Answer any *one* of the following questions : 10

(a) Write a detailed account of downstream processing. Add a note on production of ethanol. 6+4=10

(b) Write notes on : 5+5=10

(i) Production of lactic acid

(ii) Production of SCP

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