



Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (BT) (2012 to 2017) (Sem.-7)

BIOPROCESS TECHNOLOGY

Subject Code : BTBT-701

M.Code : 71843

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

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

SECTION-A

Discuss briefly :

1. Write down two basic differences between bioprocessing and chemical processing.
2. What is mean by bioconversion process?
3. Highlight at least one advantage and one disadvantage of batch over continuous fermentation process.
4. Explain continuous cell line.
5. When filter sterilization is recommended?
6. Define Respiratory Quotient.
7. In recent days, what problems associated with the bakers yeast growth in molasses encourage the choice of starchy materials from cereal grains as growth medium?
8. What is the major difference between the primary metabolite and the secondary metabolite production in relation to the microbial growth phase?
9. Explain feedback inhibition.
10. What are major ways of strain development?



SECTION-B

11. Thermal death of microorganisms in the liquid medium follows first order kinetics. If the initial cell concentration in the fermentation medium is 10^8 cells / ml and the final acceptable contamination level is 10^{-3} cells, for how long should 1.0 m^3 medium be treated at temperature of 120°C to achieve acceptable load? Consider the thermal deactivation rate constant at 120°C is $0.23 / \text{min}$.
12. What are the basic features of a fermenter? Draw a schematic to indicate them.
13. Comment on '*diffusion limitation in immobilized enzyme system*'.
14. Briefly explain the 'Chelating Agent' and 'Growth Factor' in media design.
15. Discuss chromatography technique in downstream processing.

SECTION-C

16. Describe ethanol fermentation.
17. A strain of mold was grown in batch culture on glucose and the following data were obtained :

Time (h)	Cell concentration (g/l)	Glucose concentration (g/l)
0	1.25	100
9	2.45	97
16	5.1	90.4
23	10.5	76.9
30	22	48.1
34	33	20.6
36	37.5	9.38
40	41	0.63

- a. Calculate the maximum net specific growth rate.
 - b. Calculate the apparent growth yield.
 - c. What maximum cell concentration could one expect if 150 g of glucose were used with the same size inoculum?
18. Discuss the feedback inhibition problem relating the L-Lysine production. Describe L-Lysine production including the production process, different media sources and influencing factors and downstream processing.

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.