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Total No. of Pages : 02

Total No. of Questions : 18

**B.Tech. (Biotechnology) (2012 Onwards) (Sem.-6)**  
**FUNDAMENTALS OF BIOCHEMICAL ENGINEERING**  
Subject Code : BTBT-601  
M.Code : 71072

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION 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 has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

**SECTION-A****Write briefly :**

1. What is idiophase?
2. Defined media vs. complex media
3. What is specific growth rate?
4. Define 'Degree of Reduction'.
5. Define Chemostat.
6. Name any four designs of impellers used in bioprocessing.
7. Define the term 'Integral Control'.
8. Define microbial oxygen demand.
9. Define volumetric transfer coefficient.
10. Two film theory.

**SECTION-B**

11. Discuss the CSTR kinetics and associated mass balances for substrate utilization, product and cell formation.
12. Comment on Monod kinetics. Describe the effect of limiting substrate concentration on microbial growth.
13. Explain the effect of culture and medium rheology on  $K_L a$  value.
14. Explain log penetration theory for defining air sterilization.
15. Explain the role of molecular diffusion in bioprocessing.

**SECTION-C**

16. Write a detailed explanation of various components for designing an ideal fermenter.
17. Calculate the stoichiometric coefficients of the following biological reaction if  $2/3^{\text{rd}}$  of the total carbon present in the substrate gets transformed into the biomass.



(Glucose)

(Biomass)

18. Write short notes on :
  - a) Media sterilization
  - b) Methods of determining 'pressure' as a process variable

**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.**