(i) Printed Pages : 3

(ii) Questions : 9

Roll No. .....

Sub. Code : 0 9 8 8

Exam. Code : 0 0 3 8

B.Sc. (Hons.) Biotechnology 6th Semester

(2053)

BIOPROCESS ENGINEERING AND TECHNOLOGY

Paper : BIOT–602-T

Time Allowed : Three Hours] [Maximum Marks : 67

Note :— Attempt **five** questions in all, selecting **one** question from each Unit (I-IV). Question No. **1** is compulsory.

1. Answer the following briefly :

(a) Define the Del factor. Give its significance. 2

(b) Which carbon sources are used for ethanol production ? 2

(c) Which chemicals are used for cell disruption during product recovery ? 2

(d) What is the primary treatment of water ? 2

(e) What are baffles ? Why they are required in the fermenter ? 2

(f) Define sedimentation and flocculation. 2

(g) Which filters are used for air sterilization ? Give example. 3

UNIT–I

2. (a) Describe the fundamental principles of biochemical engineering. How it differs from bioprocess engineering ?

   (b) What is the sterilization cycle ? Explain the process of media sterilization at the industrial level. 6+7=13

3. Explain the following :

   (a) Design of batch sterilization process

   (b) Methods of air sterilization. 6+7=13

UNIT–II

4. (a) What is a feedback system ? Explain the types of internal feedback systems used for controlling the fermentation processes.

   (b) Which physical and chemical parameters affect the growth kinetics of microbes during fermentation ? 6+7=13

5. (a) Describe the simple kinetics of microbial growth in a batch culture system.

   (b) What do you know about the yield coefficient and biomass productivity ? Give their significance. 6+7=13

UNIT–III

6. (a) Describe the control and measurement equipment of a fermenter.

   (b) Explain the structure and functions of the impeller. 9+4=13

7. (a) Draw the structure of a typical fermenter and explain its main components.

(b) How will you manage the aseptic operation of the fermenter? 9+4=13

UNIT–IV

8. (a) Explain the methods of removal of microbial cells and other solid materials during downstream processing.

(b) Describe the common strategies for effluent treatment. 6+7=13

9. Explain the following :

(a) Wole broth processing

(b) Aqueous two-phase extraction system. 7+6=13