## C.U.SHAH UNIVERSITY Winter Examination-2018

## Subject Name: Bioprocess Technology

|      | Subject Code: 4SC05BPT1   |                         |                         | Branch: B.Sc. (Microbiology)        |              |      |  |
|------|---|-------------------------|-------------------------|-------------------------------------|--------------|------|--|
|      | Semeste   | r: 5 Date: 28/          | 11/2018                 | Time: 10:30 To 01:30                | Marks: 70    |      |  |
|      | Instructio  | ons:                    |                         |                                     |              |      |  |
|      | (1) Use of Programmable calculator & any other electronic instrument is prohibited. |                         |                         |                                     |              |      |  |
|      | (2) Instructions written on main answer book are strictly to be obeyed.             |                         |                         |                                     |              |      |  |
|      | (3) Draw neat diagrams and figures (if necessary) at right places.                  |                         |                         |                                     |              |      |  |
|      | (4)   | Assume suitable data if | needed.                 |                                     |              |      |  |
| 0.1  |   | Attempt the followir    | a questions:            |                                     |              | (14) |  |
| Q-1  | ച   | What is bioreactor?     | ig questions.           |                                     |              | (14) |  |
|      | a)<br>b)  | What is continuous cu   | ulture?                 |                                     |              |      |  |
|      | (U)   | Define biomass vield    | coefficient             |                                     |              |      |  |
|      | ()<br>d)  | Name different types    | of impellers            |                                     |              |      |  |
|      | u)  | What is diauxic grow    | th?                     |                                     |              |      |  |
|      | ()<br>f)  | Name any two chemi      | cal methods of          | cell disruption                     |              |      |  |
|      | (1<br>(1)   | Define the term: Fern   | car methods of          | cell disruption                     |              |      |  |
|      | g/<br>h)  | Define the term: Cher   | nostat                  |                                     |              |      |  |
|      | i)  | Enlist any two advant   | ages of SCP             |                                     |              |      |  |
|      | i)  | Name the microbial c    | ulture used for         | amylase production                  |              |      |  |
|      | J)<br>k)  | Define turbidostat      | ulture used for         | unylase production                  |              |      |  |
|      | n)<br>D   | What is the role of sp  | arger in ferme          | nter?                               |              |      |  |
|      | -)<br>m)  | Define doubling time    |                         |                                     |              |      |  |
|      | n)  | Give the kinetic equat  | tion relating su        | bstrate utilization and product for | rmation.     |      |  |
| Atte | mpt anv   | four questions from O   | -2 to O-8               |                                     |              |      |  |
| 0-2  | <b>I</b> J  | Attempt all question    | S                       |                                     |              | (14) |  |
| χ-   | a)  | Explain in detail the h | basic design an         | d construction of CSTR              |              | (7)  |  |
|      | b)  | Discuss the microbial   | production of           | ethanol.                            |              | (7)  |  |
| Q-3  |   | Attempt all question    | S                       |                                     |              | (14) |  |
|      | a)  | Discuss the factors af  | fecting KL <sub>a</sub> |                                     |              | (7)  |  |
|      | b)  | Compare growth kine     | tics of batch re        | eactor and CSTR                     |              | (7)  |  |
| Q-4  |   | Attempt all question    | S                       |                                     |              | (14) |  |
|      | a)  | How do you optimize     | a bioreactor?           | Explain the methods.                |              | (7)  |  |
|      | b)  | Explain in detail the p | production of S         | Single Cell Proteins                |              | (7)  |  |
| Q-5  |   | Attempt all question    | S                       |                                     |              | (14) |  |
|      | a)  | Discuss various meth    | ods for downs           | ream processing for product recov   | very         | (7)  |  |
|      | <b>b</b> )  | Explain the computer    | control of fe           | rmentation process: system config   | guration and | (7)  |  |



application.

| Q-6 | a)<br>b)   | Attempt all questions<br>Write a note on maintenance of stock cultures.<br>Differentiate downstream with upstream processing                                 | (14)<br>(7)<br>(7) |
|-----|--|--|--------------------|
| Q-7 | <ul> <li>Attempt all questions</li> <li>a) Explain mass transfer theory and oxygen transfer system</li> <li>b) Discuss the role of temperature, dissolved oxygen, foam and pH on monitoring and control of fermentation process</li> </ul> |  | (14)<br>(7)<br>(7) |
| Q-8 | a)<br>b)   | Attempt all questions<br>Explain the various techniques used in scale up of fermentation.<br>With the help of diagram explain the basic design of fermenter. | (14)<br>(7)<br>(7) |

