Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec– 2017**

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| **Code :** | **14BT3003** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED BIOPROCESS ENGINEERING** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub. Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | *Pseudomonas sp.* has a doubling time of 2.4 h when growing on acetate. The saturation constant is 1.3 g/l and cell yield is 0.46 g cell/ g of acetate. If a chemostat is operated under feed stream concentration of 38 g/l of acetate, calculate: cell and substrate concentration when dilution rate is 0.8 of *Dmax*. | CO1 | 20 |
| (OR) | | | | |
| 2. |  | In a chemostat you observed that increase in *S0* causes increase in residual substrate concentration. Assume a Contois equation describes the things better: . Derive a relationship for ‘S’ so that . | CO1 | 20 |
|  |  |  |  |  |
| 3. |  | Aerobic degradation of Benzoic acid by a mixed culture can be represented by    Determine, *a,b,c,d,e* if RQ=0.9. Determine Y*X/S* | CO1 | 20 |
| (OR) | | | | |
| 4. |  | Explain the use of degree of reduction and RQ in formalizing elemental balance. | CO1 | 20 |
|  |  |  |  |  |
| 5. | a. | Derive the mechanistic model of enzyme kinetics, based on quasi steady-state assumption. | CO2 | 10 |
|  | b. | How would the Lineweaver-Burk plot would change in presence of uncompetitive inhibitors? | CO2 | 10 |
| (OR) | | | | |
| 6. |  | Summarize the significant differences between plant and microbial cell cultures that must be considered while designing appropriate bioreactor system? | CO2 | 20 |
|  |  |  |  |  |
| 7. |  | Give an overview of various methods applicable for active immobilization of cells in bioreactor system? | CO3 | 20 |
| (OR) | | | | |
| 8. |  | State the different approaches available for separation of soluble microbial products from culture broth? | CO3 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Compare serum-free and serum-containing media in terms of their advantages and dis-advantages. | CO3 | 10 |
|  | b. | Explain the role of CO2 in animal cell culture incubation. | CO3 | 10 |

ALL THE BEST