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

**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April / May – 2017**

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| --- | --- | --- | --- |
| **Code :** | **14BT2047** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BIOCHEMICAL ENGINEERING** | **Max. marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q. No. |  | Questions | Course  Outcome | Marks |
| 1. |  | Explain in detail the overview of fermentation process and also add a note on biochemical process. | CO2 | 20 |
| (OR) | | | | |
| 2. |  | Elaborate the process of isolation of Industrially important microbial strains. | CO1 | 20 |
| 3. |  | Derive the kinetic equation for Non-competitive and Uncompetitive toxic compound inhibition. | CO1 | 20 |
| (OR) | | | | |
| 4. |  | Derive Michealis Menten equation for single substrate reaction without inhibition. | CO1 | 20 |
| 5. |  | A strain of mold was grown in batch culture on glucose and the following data were obtained,   |  |  |  |  | | --- | --- | --- | --- | | Time (Hrs) | Cell Conc. (g/L) | Ethanol (g/L) | glucose Conc. (g/L) | | 0 | 1.5 | 0 | 100 | | 5 | 3 | 3 | 97 | | 10 | 4.9 | 7 | 90 | | 15 | 10.6 | 9 | 82 | | 20 | 20.5 | 11 | 65 | | 25 | 33 | 15 | 50 | | 30 | 45 | 20 | 32 | | 35 | 70 | 30.5 | 8 |   Calculate,   1. By fitting biomass data to logistic equation determine carrying capacity coefficient k. 2. Biomass yield coefficient. 3. Product yield coefficient | CO1 | 20 |
| (OR) | | | | |
| 6. |  | Elaborate on product formation kinetics and growth of filamentous organisms | CO1 | 20 |
| 7. |  | For the Penicillin fermentation 7 liters of medium was taken which initially contain bacterial spores of 9x106 cells/ml. The heating and cooling profile of the medium is tabulated below and the value of A=9.5x1037 min-1, E=283 KJ/mol and R=8.314 J/(mol K). Calculate holding time.   |  |  |  | | --- | --- | --- | | Time (min) | Heating Temp (0C) | Cooling Temp (0C) | | 0 | 31 | 120 | | 5 | 50 | 97 | | 10 | 72 | 90 | | 15 | 95 | 83 | | 20 | 109 | 79 | | CO2 | 20 |
| (OR) | | | | |
| 8. |  | Explain in detail the process of oxygen transfer in microbial bioreactors. | CO3 | 20 |
|  | | **Compulsory:** |  |  |
| 9. |  | Explain the Working and principle of various air lift loop bioreactor also state its advantages and disadvantages. | CO3 | 20 |