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 – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14BT2009** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BIOPROCESS PRINCIPLES** | **Max. marks :** | **100** |

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q. No.** |  | **Questions** | **Course**  **Outcome** | | Marks |
| 1. |  | Discuss in detail the configuration of a fermentor with a neat diagram. | CO-1 | | 20 |
| (OR) | | | | | |
| 2. |  | Explain in detail various stages in development of fermentation industry also tabulate various process control, vessels used and modes of operation of these process in detail | CO-1 | | 20 |
| 3. |  | Explain the process of media formulation for the industrial production of penicillin antibiotics. | CO-3 | | 20 |
| (OR) | | | | | |
| 4. |  | For the following data calculate the difference, average difference, mean square, experimental error and factors showing larger effect.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Factor | Carbon | hormones | Vitamin | Mineral | Nitrogen | Dummy1 | Dummy2 | | **Σ(H)** | 4.9 | 24.5 | 6.7 | 9.3 | 9.7 | 13 | 9.1 | | **Σ(L)** | 14.9 | 11.3 | 9.3 | 9.8 | 5.3 | 10.8 | 9.6 | | | CO-3 | 20 |
| 5. |  | Design the sterilization time for an industrial scale batch medium sterilization process. | | CO-2 | 20 |
| (OR) | | | | | |
| 6. |  | Air is sterilized through a depth filter and is sent at an flow rate of 17 m3/min for an fermentation process for 460x103 min with an linear velocity of 0.15m/min. the value of the rate constant is 1.54 m-1 .Calculate   * + 1. Initial number of microorganism present in air     2. Radius of the filter     3. Length of the filter     4. Cross sectional area of filter | CO-2 | | 20 |
| 7. |  | Explain in detail the preservation techniques followed to store isolated industrially important microbes. | CO-3 | | 20 |
| (OR) | | | | | |
| 8. |  | What are the methods involved in the development of inoculum for Bakers Yeast Process? | CO-3 | | 20 |
|  | | **Compulsory:** |  | |  |
| 9. |  | The experimental measurement of bakers yeast has shown that the carbon source is converted to biomass. For the following reaction the RQ is 0.44  C16 H34+ aO2+ bNH3 cC4.4H7.3N0.86O1.2+ d H2O + e CO2  Calculate:   1. Stoichiometric coefficients a,b,c,d and e. 2. Degrees of reduction for substrate and biomass. 3. Oxygen, Nitrogen and CO2 yield coefficient | CO-2 | | 20 |

ALL THE BEST