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 :** | **14BT2009** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BIOPROCESS PRNCIPLES** | **Max. marks :** | **100** |

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

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| Q. No. |  | Questions | Course  Outcome | Marks |
| 1. |  | Elaborate five groups of commercially important fermentation process available? Relate in detail with examples. | CO1 | 20 |
| (OR) | | | | |
| 2. |  | What is sampling? Explain various types of sampling units with a neat diagram. | CO1 | 20 |
| 3. |  | Explain in detail the process of medium formulation and the important constituents need to be added for medium formulation. | CO3 | 20 |
| (OR) | | | | |
| 4. |  | For the following data calculate the difference, average difference, mean square, experimental error and factors showing larger effect where F and G are dummy variables.   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Trial** | **C** | **N2** | **O2** | **Vit** | **Min** | **F** | **G** | **Yield** | | 1 | H | H | H | L | H | L | H | 1.2 | | 2 | L | H | H | H | L | H | L | 7.1 | | 3 | L | L | H | H | H | L | H | 1.4 | | 4 | H | L | L | H | H | H | L | 0.7 | | 5 | L | H | L | L | H | H | H | 6.1 | | 6 | H | L | H | L | L | H | H | 0.8 | | 7 | H | H | L | H | L | L | L | 1.1 | | 8 | L | L | L | L | L | L | L | 1.4 | | CO3 | 20 |
| 5. |  | Illustrate the sterilization holding time for an industrial scale batch medium sterilization process wth an example. | CO2 | 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 | CO2 | 20 |
| 7. |  | Elaborately explain the process of isolation of industrially important microorganisms. | CO3 | 20 |
| (OR) | | | | |
| 8. |  | Describe with a neat diagram the process of inoculum development for brewing process. | CO3 | 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 | CO2 | 20 |