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 :** | **14BT2020** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DOWNSTREAM PROCESSING** | **Max. marks :** | **100** |

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

|  |  |  |  |
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| **Q. No.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | Explain in detail on chemical, enzymatic and mechanical methods of cell disruption. | CO 1 | 20 |
|  | (OR) |  |  |
| 2. | Express the various methods involved in pre treatment of fermentation broth with examples. | CO 1 | 20 |
| 3. | Define filtration and describe the different equipments used for filtration process with a neat diagram. | CO 2 | 20 |
|  | (OR) |  |  |
| 4. | Describe any two types of centrifuge with neat diagram. | CO 2 | 20 |
| 5. | What is Ion - Exchangers? Explicate the principle, operating modes and practice of ion -exchange chromatography. | CO 1 | 20 |
|  | (OR) |  |  |
| 6. | Explain in detail on Gel permeation chromatography. | CO 1 | 20 |
| 7. | Illustrate the principle, extraction process, equipment and applications of aqueous Two – Phase extraction. | CO 3 | 20 |
|  | (OR) |  |  |
| 8. | Elucidate on the Protein precipitation methods. | CO 3 | 20 |
| **Compulsory:** | |  |  |
| 9. | Discuss briefly on Lyophilization. | CO 2 | 20 |

**ALL THE BEST**