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 :** | **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 the principle of centrifugal separation and also express any two types of centrifugation with a neat labeled diagram. | | CO1 | 20 |
| (OR) | | | | |
| 2. | Write notes on the operation and functioning of bead mill disruption, high pressure homogenizer, ultrasonication and release of intracellular enzymes by disruption methods. | | CO1 | 20 |
| 3. | What are the salient features of batch and CSTR adsorption and express Langmuir isotherm? | | CO1 | 20 |
| (OR) | | | | |
| 4. | Classify the membrane separation processes and explain on dialysis, Electrodialysis, pervaporation with a neat labeled diagram. | | CO2 | 20 |
| 5. | What are ion - exchangers? Explain the principle, operating modes and practice of ion -exchange chromatography. | | CO2 | 20 |
| (OR) | | | | |
| 6. | Explain the basic principle and the types in planar chromatography techniques. | | CO2 | 20 |
| 7. | Describe in detail on freeze drying and its advantages. | | CO3 | 20 |
| (OR) | | | | |
| 8. | What are the theoretical considerations involved in drying? | | CO3 | 20 |
|  | | **Compulsory:** |  |  |
| 9. | Outline the downstream processing steps involved in biological products manufacture. | | CO1 | 20 |

ALL THE BEST