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 :** | **14FP3019** | **Duration :** | **3hrs** |
| **Sub. Name :** | **Advances in Food Process Engineering** | **Max. marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain the method of freeze concentration with a neat sketch | CO 1 | 15 |
|  | b. | The activation energy for vitamin C thermal destruction for 11.2º Brixgrapefruit juice was calculated to be equal to 4.98 kcal/mol basedon k values between 61ºC and 96ºC. Calculate the z value for vitamin Cthermal destruction in grapefruit juice. | CO 1 | 05 |
| (OR) | | | | |
| 2. | a. | Food with an initial moisture content of 380% (dry-weight basis) is poured into 0.4 cmlayers in a tray placed in a freeze drier operating at 40 Pa. It is to be dried to 10%moisture (dry-weight basis) at a maximum surface temperature of 55ºC. Assuming thatthe pressure at the ice front remains constant at 78 Pa, calculate (a) the drying time and(b) the drying time if the layer of food is increased to 0.8 cm and dried under similarconditions. (Additional data: the dried foodhas a thermal conductivity of 0.03 W/mK, a density of 470 kg /m3, a permeability of 2.4 x10-8kg/s and the latent heatof sublimation is 2.95 x 103 kJ/ kg.) | CO 1 | 05 |
| b. | Describe the various types of freeze driers with a neat sketch | CO 1 | 15 |
| 3. | a. | Give a detailed account on microwave processing of foods | CO 2 | 20 |
| (OR) | | | | |
| 4. | a. | Categories the membrane separation process and membrane modules | CO 1 | 20 |
| 5. | a. | Explain in detail about the food irradiation methods and mention the changes that occurs in the foods during irradiation. | CO 2 | 20 |
| (OR) | | | | |
| 6. | a. | Give an account of super critical fluid extraction of food materials. | CO 1 | 20 |
| 7. | a. | Express your idea about aseptic processing of foods | CO 2 | 20 |
| (OR) | | | | |
| 8. | a. | Discuss the application of biosensors and biocatalysts in food | CO 3 | 20 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Explain in detail about various non thermal methods of food processing methods | CO 3 | 20 |

ALL THE BEST