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 :** | **14FP3020** | **Duration :** | **3hrs** |
| **Sub. Name :** | **Engineering Properties of Food** | **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 following properties of food materials.   1. Size 2. Sphericity 3. Aspect ratio | CO2 | 10 |
| b. | Give the different types of porosities and Illustrate any one method to determine the porosity. | CO3 | 10 |
| (OR) | | | | |
| 2. | a. | Explain with a neat diagram the measurement of volume of a fruit through liquid displacement method. | CO3 | 10 |
| b. | Illustrate with a diagram the working principle of lactometer. | CO2 | 10 |
| 3. | a. | Write in brief about the following:   1. Bioyield point 2. Rupture point 3. Poisson’s ratio 4. Bulk modulus | CO2 | 8 |
|  | b. | Give any 5 applications of rheology in food engineering | CO3 | 5 |
|  | c. | Illustrate with a neat sketch working of any on rotational viscometer | CO2 | 7 |
| (OR) | | | | |
| 4. | a. | Describe the method for evaluation of adhesiveness and springiness of food materials. | CO1 | 15 |
|  | b. | Write a note on alveograph. | CO2 | 5 |
| 5. | a. | Derive an expression for thermal conductivity of food using Fourier’s law . | CO2 | 7 |
|  | b. | Describe the method for estimation of thermal conductivity by Heat of vaporization. | CO1 | 8 |
|  | c. | Write a note on thermal diffusivity. | CO1 | 5 |
| (OR) | | | | |
| 6. | a. | Explain Radial Heat Flow Methods for determination of thermal conductivity. | CO2 | 10 |
|  | b. | Illustrate with a diagram the construction and working of Differential Scanning Calorimeter. | CO2 | 10 |
| 7. | a. | Explain the following.   1. Henry’s law 2. Raoult’s law 3. Boiling point elevation | CO1 | 10 |
|  | b. | Explain any one method of preparation of water activity sorption isotherm. | CO2 | 10 |
| (OR) | | | | |
| 8. | a. | Determine the boiling temperature of 10% (w/w) NaCl solution under atmospheric pressure.  Data: Molecular weight of NaCl: 58.4 g/g-mole  Enthalpy of saturated vapor: 2676.1 kJ/kg at 100◦C  Enthalpy of saturated liquid: 419.04 kJ/kg at 100◦C  R, gas constant: 8.31434 kJ/kg-mole K. | CO3 | 8 |
|  | b. | Describe Water Activity Determination by Vapor Pressure Measurement. | CO2 | 12 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Explain the basic principle of microwave heating. | CO1 | 10 |
|  | b. | Estimate the penetration depth of a chicken meat during processing in home type  microwave oven. Chicken meat has a dielectric constant of 53.2 and dielectric loss factor of 18.1. Assume that dielectric properties are constant during heating. | CO3 | 7 |
|  | c. | Define dipolar rotation. | CO1 | 3 |

ALL THE BEST