

**THE KAVERY ENGINEERING COLLEGE***(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025***Sixth Semester**Agricultural Engineering***AI3007 - Emerging Technologies in Food Processing***Regulations - 2021**Duration : 3 Hrs**Maximum : 100 Marks***PART - A (ANSWER ALL QUESTIONS) (Marks 10\*2=20)**

| <i>Q.No</i> | <i>Questions</i>                                                                       | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|----------------------------------------------------------------------------------------|------------|-----------|--------------|
| 1.          | Recall the principles of high-pressure processing of food.                             | L1         | 1         | 2            |
| 2.          | List the various process of high pressure freezing of food.                            | L1         | 1         | 2            |
| 3.          | Outline the principles of PEF.                                                         | L2         | 2         | 2            |
| 4.          | Infer the food safety aspects of pulsed electric fields.                               | L2         | 2         | 2            |
| 5.          | Show the fundamentals of food irradiations.                                            | L1         | 3         | 2            |
| 6.          | List the various types of radiation.                                                   | L1         | 3         | 2            |
| 7.          | Recall the challenges in ultrasound processing of foods.                               | L1         | 4         | 2            |
| 8.          | Relate the effect of radio frequency electric field on inactivation of microorganisms. | L1         | 4         | 2            |
| 9.          | What is hurdle technology?                                                             | L1         | 5         | 2            |
| 10.         | Recall the microwave vacuum drying of food products.                                   | L1         | 5         | 2            |

**PART - B (ANSWER ALL QUESTIONS) (Marks 5\*16 = 80)**

| <i>Q.No</i> | <i>Questions</i>                                                                                                           | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|----------------------------------------------------------------------------------------------------------------------------|------------|-----------|--------------|
| 11.         | a i Outline the mechanisms and applications of high-pressure processing on various food system.                            | L2         | 1         | 10           |
|             | ii Relate the effects of high pressure on microorganisms and nutritional quality of foods.                                 | L2         | 1         | 6            |
|             | Or                                                                                                                         |            |           |              |
|             | b i Illustrate the principles and equipments involved in processing of high pressure freezing of foods.                    | L2         | 1         | 10           |
|             | ii Infer the microbiological and enzymatic inactivation after high pressure freezing.                                      | L2         | 1         | 6            |
| 12.         | a Interview the mechanism, treatment systems & process parameters and equipments involved in processing of PEF technology. | L3         | 2         | 16           |
|             | Or                                                                                                                         |            |           |              |
|             | b Interview the inactivation mechanisms and application of PEF on solid, semi-solid and liquid foods.                      | L3         | 2         | 16           |

|     |   |                                                                                                                                                                                                                                                                 |                                                                                      |    |    |    |
|-----|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|----|----|----|
| 13. | a | Select the sources and mode of action of ionizing radiation of food products. Highlight the each action in detail.                                                                                                                                              | L3                                                                                   | 3  | 16 |    |
|     |   | Or                                                                                                                                                                                                                                                              |                                                                                      |    |    |    |
|     | b | Interview the dose requirement, regulations and radiation effect on various food constituents and products.                                                                                                                                                     | L3                                                                                   | 3  | 16 |    |
| 14. | a | i                                                                                                                                                                                                                                                               | Illustrate the principles and technological aspects of high pulsed light technology. | L2 | 4  | 10 |
|     |   | ii                                                                                                                                                                                                                                                              | Infer the effects of PLT technology on microorganisms and food quality.              | L2 | 4  | 6  |
|     |   | Or                                                                                                                                                                                                                                                              |                                                                                      |    |    |    |
|     | b | i                                                                                                                                                                                                                                                               | Explain the principles and processing tool of ultrasound processing of food.         | L2 | 4  | 10 |
|     |   | ii                                                                                                                                                                                                                                                              | Infer the effects and applications of ultrasound processing of food.                 | L2 | 4  | 6  |
| 15. | a | Assume that you are food process engineer in renowned R&D company that specializes in ready to eat meals. Analyze the mechanisms, dielectric & thermal properties and recent developments in microwave heating of food products.                                | L4                                                                                   | 5  | 16 |    |
|     |   | Or                                                                                                                                                                                                                                                              |                                                                                      |    |    |    |
|     | b | A client company is seeking to develop a shelf-stable, nutrient-rich fruit smoothie powder that retains maximum flavor, color, and nutritional content. Analyze the working principles, application and recent developments of microwave freeze drying of food. | L4                                                                                   | 5  | 16 |    |