


| Name:   |  |  |     |
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| Enrolment No:   |  |   |     |
| <b>UNIVERSITY OF PETROLEUM AND ENERGY STUDIES</b><br><b>End Semester Examination, December 2022</b> |  |   |     |
| Course: Food Preservation Technology  |  | Semester: III   |     |
| Program: B.Tech. Food Tech.   |  | Duration: 3 Hours   |     |
| Course Code: HSFT 2005  |  | Max. Marks: 100   |     |
| Instructions:   |  |   |     |
| S. No.  | Section A  | Marks   | COs |
|   | <b>Short answer questions/ MCQ/T&amp;F</b><br><b>(20Qx1.5M= 30 Marks)</b>  |   |     |
| Q1  | Statement 1: Freezing with nitrogen or carbon dioxide gas is rapid freezing.<br>Statement 2: Super cooling is a property of food products.<br>a) True, False<br>b) True, True<br>c) False, False<br>d) False, True   | 1.5   | CO4 |
| Q2  | Statement 1: When food items are frozen, there is a drop in temperature followed by a further drop when they freeze.<br>Statement 2: Fish should be rapidly frozen, not slowly frozen.<br>a) True, False<br>b) True, True<br>c) False, False<br>d) False, True | 1.5   | CO4 |
| Q3  | Freon group of refrigerants are<br>(A) Inflammable<br>(B) Toxic<br>(C) Non-inflammable and toxic<br>(D) Nontoxic and non-inflammable   | 1.5   | CO4 |
| Q4  | When the crystallization process takes place for a long time, the size of the crystals is _____<br>a) Small<br>b) Large<br>c) No crystals formed<br>d) None of the mentioned   | 1.5   | CO4 |
| Q5  | Ice crystals in frozen meat should be formed by rapid crystallization.   | 1.5   | CO4 |

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|     | a) True<br>b) False  |     |     |
| Q6  | Which of the following dryer is used to dry seeds?<br>a) Spray dryer<br>b) Cabinet tray dryer<br>c) Pneumatic dryer<br>d) Fluidized bed dryer  | 1.5 | CO2 |
| Q7  | The temperatures used for canning foods ranges from ____<br>a) 0-20 degree C<br>b) 20-60 degree C<br>c) 60-100 degree C<br>d) 100-121 degree C   | 1.5 | CO2 |
| Q8  | Which of the following is the time-temperature combination for HTST pasteurization?<br>a) 72°C to 74°C for 15 to 20 seconds<br>b) 135°C to 140°C for 2 to 4 seconds<br>c) 63°C for 30 minutes<br>d) 57°C to 68°C for 15 min        | 1.5 | CO2 |
| Q9  | Which of the following is the time-temperature combination for Sterilization?<br>a) 72°C to 74°C for 15 to 20 seconds<br>b) 135°C to 140°C for 2 to 4 seconds<br>c) 63°C for 30 minutes<br>d) 115 – 120°C for some 10 – 20 minutes | 1.5 | CO3 |
| Q10 | Which of the following dryer is best for powdered or granular samples?<br>a) Fluidized bed dryer<br>b) Drum dryer<br>c) Cabinet tray dryer<br>d) Pneumatic dryer   | 1.5 | CO3 |
| Q11 | Heat exchanger works on which of the following principle?<br>a) Direct heating<br>b) Indirect heating<br>c) Slow heating<br>d) Fast heating  | 1.5 | CO3 |
| Q12 | Which of the following is target microbe in commercial sterilization?<br>a) Pseudomonas aeruginosa<br>b) Bacillus anthracis  | 1.5 | CO3 |

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|     | c) Salmonella typhi<br>d) Clostridium botulinum   |     |     |
| Q13 | Which process is generally carried out by retorts?<br>a) Pasteurization<br>b) Freezing<br>c) Blanching<br>d) Sterilization  | 1.5 | CO3 |
| Q14 | The quality problem for sliced apple and potato is<br>a) Enzymatic browning<br>b) Lipolytic rancidity<br>c) Hydrolytic rancidity<br>d) Putrefaction   | 1.5 | CO2 |
| Q15 | In drying of fruit which chemical is used to minimize browning<br>a) Carbon dioxide<br>b) Sulphur dioxide<br>c) Benzene<br>d) Chlorophyll   | 1.5 | CO2 |
| Q16 | Main causative spoilage organisms of dried fruits and vegetables are<br>a) Mould<br>b) Yeast<br>c) Bacteria<br>d) All of them   | 1.5 | CO1 |
| Q17 | Subjecting fats to high temperature in the presence of oxygen such that fats deteriorate is called _____<br>a) Hydrolytic rancidity<br>b) Auto- oxidation<br>c) Thermal decomposition<br>d) Lipolysis   | 1.5 | CO3 |
| Q18 | Rice has a higher water activity than apples.<br>a) True<br>b) False  | 1.5 | CO6 |
| Q19 | Statement 1: Sodium chloride has a higher water activity than sucrose.<br>Statement 2: Sucrose creates structures in water and reduces water activity below what they should be based on concentration alone.<br>a) True, False<br>b) True, True<br>c) False, False<br>d) False, True | 1.5 | CO6 |

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| Q20  | Which of the following evaporator cannot be used for milk?<br>a) Scraped surface evaporators<br>b) Fluidized bed evaporators<br>c) Plate-and-frame type evaporators<br>d) Batch Pan  | 1.5 | CO5 |
| <b>Section B</b><br><b>(4Qx5M=20 Marks)</b>  |  |     |     |
| Q 1  | Define concentration method. Differentiate between dehydration and drying. Describe three food dryers in brief.  | 5   | CO5 |
| Q 2  | Define tonne of refrigeration. Explain the working of refrigeration system with components.  | 5   | CO4 |
| Q 3  | Describe the importance of blanching also explain various applications of blanching. List down reasons for food spoilage.  | 5   | CO3 |
| Q 4  | What do you understand by crystallization? Differentiate between slow and quick freezing.  | 5   | CO4 |
| <b>Section C</b><br><b>(2Qx15M=30 Marks)</b> |  |     |     |
| Q 1  | Nancy works at a cheese processing unit. They subject the cheese to oxidation. Which of the following comments pertaining to the above scenario are correct? <b>(2 marks)</b><br>a) Oxidation is necessary for products like cheese<br>b) Lipid Oxidation is otherwise a major concern for the food industry<br>c) Deterioration of fats and oils is called rancidity<br>d) All of the mentioned<br>What are the various factors responsible for rancidity? <b>(3 marks)</b><br>What is frying and its principle? <b>(5 marks)</b><br>Describe different food frying methods. <b>(5 marks)</b> | 15  | CO3 |
| Q 2  | Sunil owns a fruit and vegetable processing unit, and it produces fruit powder as its final product. Also, he wants to add a processing line for fruit pulp. Answer the following questions:<br>a) Describe principle and working of a dryers he may be using for production of fruit powder with schematic diagram. <b>(10 marks)</b><br>b) Suggest and describe in detail the most suitable dryer for fruit pulp drying. <b>(5 marks)</b>  | 15  | CO5 |
| <b>Section D</b><br><b>(2Qx10M=20 Marks)</b> |  |     |     |
| Q 1  | Explain the following processes <b>(2 marks each)</b> :<br>a) Thawing  | 10  | CO5 |

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|     | b) Roasting<br>c) Concentration<br>d) Canning<br>e) Evaporation   |    |     |
| Q 2 | What is water activity mention its importance for food processing? Describe different types of food spoilage in detail. | 10 | CO1 |