Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–III (NEW) EXAMINATION – WINTER 2020

Subject Code: 3131405 Date: 10/03/2021

Subject Name: Introduction to Food Processing Technology

Time:10:30 AM TO 12:30 PM Total Marks:56

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Define: a. Decimal Reduction Time b. Thermal death time c. Thermal Resistance (Z value)	**03**
	(b)	Define cleaning and grading. List out the factors on which cleaning and grading depend upon.	**04**
	(c)	What do you understand by overall material balance? State the law of conservation of mass.	**07**
Q.2	**(a)**	What are the significant causes of food deterioration?	**03**
	(b)	Why peeling is vital in the food processing industry. Discuss Lye Peeling in detail.	**04**
	(c)	Write a detailed note on the current status of the Indian food industry.	**07**
Q.3	**(a)**	Enlist the physical, chemical, and biological methods of food preservation.	**03**
	(b)	Describe the working principle with a diagram 1. Jaw crusher 2. Gyratory crusher	**04**
	(c)	Discuss in detail the food deterioration by enzymatic and non-enzymatic chemical reactions.	**07**
Q.4	**(a)**	What do you understand by Units for measurements? Discuss different types of physical quantities.	**03**
	(b)	What are different rating tests used for the evaluation of food quality? Briefly explain any one of them.	**04**

	(c)	Milk is processed with a heat exchanger having a parallel flow pattern. Milk is to be produced at 5000 kg/h at 150^0C. Milk with an initial temperature of 15^0C is fed to the heat exchanger. Steam at 543.1 kPa and 100% quality is used for heating. Condensate at 155^0C flows from the steam trap. What is the required flow rate of steam? Enthalpy of steam is 2746 kJ/kg. Specific heat of milk and condensate are 3.8 and 4.18 kJ/kg^{0}C.	**07**
Q.5	**(a)**	Draw a flow chart for the canning process.	**03**
	(b)	Explain the concept of mega food parks in India?	**04**
	(c)	Milk with 3.8% fat and 8.1% Fat-Free Solids (FFS) is used to produce concentrated canned milk. The process includes the separation of cream in a centrifuge and the partially defatted milk concentration in an evaporator. If the cream produced in the centrifuge contains 55% water, 40% fat, and 5% Fat-Free Solids, calculate how much milk is necessary to produce a can of concentrated milk containing 410g milk with 7.8% fat and 18.1% FFS. How much cream and how much water must be removed in the centrifuge and the evaporation, respectively.	**07**
Q.6	**(a)**	Give the steps for the formation of superheated steam.	**03**
	(b)	What do you understand by Sensible Heating and Cooling? Show the same with the diagram.	**04**
	(c)	Discuss the role of FSSAI and BIS in food business regulation in India.	**07**
Q.7	**(a)**	What do you mean by the homogeneity of equations? Explain with example.	**03**
	(b)	List out "Eight (8)' different psychrometric properties and write down its application on food processing.	**04**
	(c)	Describe the following with a suitable diagram: a. Fluidized bed freezers b. Liquid immersion freezing	**07**
Q.8	**(a)**	What are different methods of drying for food products? Explain any one of them.	**03**
	(b)	Discuss the contribution of the food processing sector to India's GDP	**04**
	(c)	List out the uses of energy balance in the food industry. Justify "The energy entering the system plus energy generated and accumulated equals the energy out plus energy lost" with example	**07**

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