Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) EXAMINATION – SUMMER 2019

Subject Code: 2131405 **Date: 04/06/2019**

Subject Name: Introduction to Food Processing Technology

Time: 02:30 PM TO 05:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Define the followings; **03**

1. Dew point temperature
2. Specific volume
3. Blanching

(b) State the use of psychometric chart in food processing. Draw a neat labelled diagram of psychometric chart indicating various variables. **04**

(c) What do you mean by Engineering units, Dimensions and Derived Units? Prove that the given equation is homogeneous or not $s = ut + 1/2\ at^2$. **07**

Q.2 **(a)** Give the importance of instrumentation and control in food industry. List out the equipments used for temperature measurement, flow measurements and pressure measurements. **03**

(b) What is food quality? Discuss food quality evaluation method. **04**

(c) A retort and 2000 cans of tuna fish have been heated to a uniform temperature of 116^0C. It is desired to cool the cans to 35^0C before removing them from the retort. How much cooling water is required if it enters the retort at 20^0C and leaves at 30^0C. Given **07**

Specific heat of tuna fish = 3.65kJ/kg^{0}C
Specific heat of can wall = 0.46kJ/kg^{0}C
Specific heat of water = 4.18kJ/kg^{0}C
Mass of tuna fish/can = 450gm
Energy required to cool retort = 75000KJ
Mass of can wall/can = 55g

OR

(c) Discus the followings in details **07**

1. Criteria based on which, cleaning and grading equipments are classified
2. Importance and Advantages of material handling
3. Importance of size reduction in food industries

Q.3 **(a)** Discuss the followings in details **03**

1. Formation of steam
2. Latent heat and Sensible heat

(b) Discuss the Rittinger's, Bonds and Kick's Law in size reduction. Also draw stress-strain diagram to identify the types of material. **04**

(c) How you grade the present status of food industry in India? Give your view regarding the future growth of food processing in India. **07**

OR

Q.3 **(a)** Explain different methods of sensory evaluation of food in industry. **03**

(b) Discuss in detail about recommended daily allowance. **04**

(c) In the concentration of orange juice a fresh extracted and stained juice containing 7.08% solid is fed to an evaporator. In the evaporator, water is removed and the solids content increased to 58% solids. For 1000 kg/h entering, calculate the amounts of the outlet streams of concentrated juice and water. **07**

Q.4	**(a)**	Explain how energy requirements of Indians are assessed?	**03**
	(b)	Discuss subjective and objective evaluation of food products.	**04**
	(c)	Differentiate between cleaning and grading. Explain the working principle of hand operated double screen grain cleaner and seed grader with diagram.	**07**

OR

Q.4	**(a)**	What do you understand by 1. balance diet 2. Entrepreneurship 3. Energy balance	**03**
	(b)	Differentiate between 1. Abrasion peeling and Caustic peeling 2. Dry bulb temperature and Wet bulb temperature	**04**
	(c)	Justify with appropriate reasons "Why Food Processing Technology is Multidisciplinary Branch".	**07**
Q.5	**(a)**	Briefly describe about protein requirement of Indians.	**03**
	(b)	What is drying? How it helps in preservation? Discuss different advantages of drying.	**04**
	(c)	Why instrumentation and control is the heart of the process? Give some reasons.	**07**

OR

Q.5	**(a)**	Explain the followings; 1. Formation of superheated steam 2. Steam blanching 3. Drying and Dehydration	**03**
	(b)	Classify the nutrients into various categories on the basis of their functions?	**04**
	(c)	A continuously operated rotary drier is used to dry 12 kg/min of a starch-based food containing 25% moisture (wet weight basis) to give a product containing 10% moisture. However, the drier cannot handle feed material with moisture content greater than 15% and therefore a proportion of dry product must be recycled and mixed with the fresh feed. Calculate the evaporation rate and the recycle ratio.	**07**

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