Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – SUMMER • 2014

Subject Code: 161402 Date: 21-05-2014

Subject Name: Food Rheology and Sensory Evaluation

Time: 10:30 am - 01:00 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)** Answer the following questions briefly. **06**

i) What are the electrical equivalences for the mechanical and rehological properties of the food materials?

ii) What do you understand by scaling?

(b) Introduce the followings in brief. **08**

i) True stress and stiffness with reference to food material

ii) Effect of moisture and emulsifier content on chocolate mass

Q.2 **(a)** Describe the calibration procedure of metal oxide semiconductors based electronic nose. **07**

(b) A biscuit manufacturer is evaluating new packaging material. He would like to compare the product sensory attributes after recommended shelf life in new packaging material and existing packaging material. Suggest the most appropriate sensory evaluation method and design sensory evaluation score card. **07**

OR

(b) XYZ company developed new flavoured ice cream. The company wishes to compare their new product with competitor's market product in respect to overall liking. Suggest the most suitable sensory evaluation method and design sensory evaluation card. **07**

Q.3 **(a)** Discuss the steps to carry out the sensory evaluation study of food product. **07**

(b) What are the different dynamic tests to find rheological properties of the food? **04**

(c) Explain the critical length. **03**

OR

Q.3 **(a)** State the classification of sensory evaluation methods. Discuss sensitivity test. **07**

(b) Discuss different elasticity modulus of bio material and what is their importance? **04**

(c) Discuss the merits and limitation of human olfactory system and e-nose with suitable examples. **03**

Q.4 **(a)** Following data of shear rate at different shear stress were recorded during thickening of chocolate. If it is predicted that following model is likely to fit find the coefficient. Calculate the value of constants. **07**

$$(\tau)^{½} = A + B\,(\dot{E})^{½}$$

Shear rate ($\dot{E}$)	0.2	0.5	0.8	2.5	8.2	14.0	17.0	22.0
Shear stress (τ)	46	60	85	160	370	555	650	790

(b) How color is quantified? Describe CIE system of color measurement. **04**

(c) Test control is important in sensory evaluation. Justify the statement. **03**

OR

Q.4 **(a)** Differentiate with help of force deformation curve and explain textural profile of a crispy and leathery product. **07**

(b) Flow behavior of force deformation curve of food 'X' and 'Y' makes a tangent modulus at point P of 2 and 30^{o} from horizontal respectively. Draw the figure. What do you infer? **04**

(c) Define the following terms. **03**

i) Grading ii) Dilatant fluid iii) Bingham plastic

Q.5 **(a)** Food sample "A" and "B" are compared and following data are recorded. What are the inferences you can derive from them. **07**

Property	**Sample "A"**	**Sample "B"**
Stiffness	2S	S
Bio-yield point	3B	B
Strain at bio yield point	C	C
Rupture point	2.8 B	0.65 B
Strain at rupture point	1.07 C	3 C

(b) Highlight on training of panel members intended for descriptive type of sensory test. **04**

(c) Number of samples and time of evaluation are affecting on the validity of sensory test. Express your opinions. **03**

OR

Q.5 **(a)** Develop generalized equation of the stress-strain in the Maxwell model. Prove that at the time of stress relaxation, stress in the body is 1/e times the initial stress. **07**

(b) What are the applications of consumer test? **04**

(c) Discuss the importance of the secant modulus of elasticity. **03**

****