

GUJARAT TECHNOLOGICAL UNIVERSITY
BE –SEMESTER 7 (NEW SYLLABUS) EXAMINATION- SUMMER 2018

Subject Code: 2171402**Date: 01-05-2018****Subject Name: Food Rheology and Sensory Evaluation****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) What is significance of plasticity of visco-elastic material? **03**
- (b) Differentiate between Mechanical hysteresis and Resilience? **04**
- (c) What type of flow behavior chocolate mass depicts in rheology? Highlight on the effect of following parameters on the flow behavior of chocolate mass. **07**
- i) Emulsifier content
 - ii) Conching
 - iii) Particle size distribution
- Q.2**
- (a) Explain: Beers' law; Saturation and Absorbency. **03**
- (b) With the help of generalized equation of visco-elastic material, explain shear thinning? **04**
- (c) With force deformation curve differentiate the rheological properties of *papad* and *khakhara*? **07**
- OR**
- (c) What are different types of reactive surfaces used in E-nose? How they work? Enlist the limitations of e-nose. **07**
- Q.3**
- (a) State the significance of the followings in conducting sensory evaluation. **03**
- i) Three Digit number coding of samples
 - ii) Sample screening
 - iii) Serving matrix
- (b) Introduce briefly the physiological factors affecting sensory verdict. **04**
- (c) How Farinograph depicts the rheological behavior of cereal flour dough? Draw a well labeled graphical representation. **07**
- OR**
- Q.3**
- (a) Differentiate between emulsifier and stabilizer used in food industry. **03**
- (b) Highlight on salient features of composite scoring test. **04**
- (c) Explain Texture Profile Analysis with Time – Force graph of two bite simulation. Calculate the chewiness and cohesiveness of sample if the following data were obtained from time force graph. **07**
- Hardness – 3 N Area of First curve – 2.1 cm²
Springiness – 0.3 mm Area of second curve – 0.9 cm²
- Q.4**
- (a) Draw mechanical and electrical analog of the following: **03**
- i) Maxwell model
 - ii) Kelvin model
- (b) A colour has been said to be “R + 6G + 14Y”. Explain with figure. **04**
- (c) Apples (20kg) were packed in wooden box under compression. The instant load applied while packing on the first layer was 80 N. The initial and equilibrium modulus of elasticity of apple was 140 and 70 N/mm². **07**

Compute the time of relaxation of apples if after 24 hours elasticity of the apples was found to be 110 N/mm^2 with total deformation is 0.28 mm. State the importance of time of relaxation.

OR

- Q.4** (a) What is significance of plasticity of Secant modulus? **03**
(b) Classify the Rheological behavior of bio-material. **04**
(c) Develop generalized equation of the stress-strain in the Maxwell model. **07**
Prove that at the time of stress relaxation, stress in the body is $1/e$ times the initial stress.

- Q.5** (a) Enlist the steps involved in training of descriptive type of panel members in sensory evaluation. **03**
(b) Highlight on sensory evaluation laboratory layout. **04**
(c) Fruit drink manufacturer came across with one new flavor supplier. If the company uses the new flavor, product cost can decrease. The supplier claims that use of his flavor will give the same existing product sensory attribute. Suggest the most suitable sensory evaluation test which can confirm the difference is not apparent. Design sensory score card for the suggested test. **07**

OR

- Q.5** (a) Introduce briefly Fundamental test and imperical type of test used in texture analyzer. **03**
(b) Classify Food Emulsions based on type of phase and internal phase ratio. **04**
(c) Define consumer test. Discuss the applications of consumer test. **07**
