

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI • EXAMINATION – SUMMER 2013****Subject Code: 161402****Date: -27-05-2013****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.
4. Plain Graph Paper is to be used.

- Q.1 (a)** Write short notes on the following **07**
(i) True stress (ii) Critical Sample length (iii) Stiffness
(iv) St. Venant Body (v) Flavor (vi) Resilience; (vii) Creep
- (b)** Answer the following questions in brief **07**
(i) What are factors to be optimized by the sensory analyst before sensory evaluations?
(ii) Highlight the sensory perception attributes?
(iii) What is magnitude estimation scale used in sensory evaluation?
(iv) Define terminal threshold value?
(v) Compare compression and cutting principle in texture measurement?
(vi) State the applications of Hedonic rating test?
(vii) Explain kinematic viscosity of fluid?
- Q.2 (a)** i. Why there is need to have dynamic mechanical test to study the **04**
rheological properties of the food material?
ii. What do you understand by Expectation error and Timidity? How **03**
these can be controlled in sensory evaluation?
- (b)** What is significance of time of retardation? Develop a relationship to **07**
prove that at the time of retardation, strain in the biological material is
only 63.2% of the total strain.
- OR**
- (b)** Why biological materials have more than one modulus of elasticity? **07**
What are they? What is their significance?
- Q.3 (a)** What is purpose of e-nose? Explain its working and process of **07**
calibration?
- (b)** In an ultrasonic pulse propagation technique a cylindrical specimen of **07**
the carrot (20 mm diameter and 90 mm long) having 70 % moisture
content (w.b.) was tested. Calculate the modulus of elasticity of the
sample if ratio of transverse strain to axial strain is 0.16 and time
required to travel the wave is recorded as 2 milliseconds. The mass of the
sample is 32g.

OR

- Q.3 (a)** Draw a well labeled Time-Force relationship diagram used in texture analysis of food product. Explain the various attributes of food products shown on the Time-force diagram. **07**
- (b)** An apple was tested under compression. The instant load applied was 200g. The initial and equilibrium Modulus of elasticity of the apple was 100 and 60 N /mm² respectively. The mass density of the apple initially and finally is found to be 1.09 and 1.13g/cm³ respectively. Compute the time of relaxation of the apple if modulus of elasticity of the apple after 18 hours is found to be 99 N /mm² with total deformation is 0.37 mm. **07**
- Q.4 (a)** Explain the features and their significance included in the **TEST CONTROL IN THE SENSORY EVALUATION**? **07**
- (b)** Plot the stress-strain curve and explain different properties of the product: **04**
- Fruit jam and honey
 - Flaked rice and puffed rice **03**
- OR**
- Q.4 (a)** Plot the force deformation curve and explain textural profile of: **04**
- Roasted and unroasted *PAPAD*
 - Cooked and uncooked rice
- (b)** How the sensory study of new product is done? **07**
- Q.5 (a)** What are the requirements of setting up a sensory evaluation laboratory? **07**
- (a)** Chord modulus of the stored food between 2 and 6 months is found to be 12°. Same food further stored for three more months and its Chord modulus between 2 and 9 months is found to be 30°. Discuss what are the characteristics changes took place in the food, resulted it not acceptable by the consumers. **07**
- OR**
- Q.5 (a)** The following data are recorded by a viscometer at a shear rate of 35s⁻¹ for banana puree. Calculate the viscosity of banana puree at 14°C? **07**
- | | | | | | | |
|--------|-------|-------|------|------|------|------|
| T (°C) | (-)18 | (-)10 | (-)5 | 5 | 10 | 20 |
| (Pa S) | 1.02 | 0.80 | 0.70 | 0.53 | 0.47 | 0.37 |
- (b)** Describe traditional and modern methods of color measurement. **07**
