Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER 2013

Subject Code: 171402 **Date: 05-12-2013**

Subject Name: Food Standards and Quality Assurance

Time: 10:30 TO 01:00 **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 sensory evaluation and classify its types. Enumerate practical applications where it can be used in food industry. With the help of suitable examples explain how does sensory evaluation technique can aid the following: (i) Quality control (ii) New product development (iii) Product packaging development **07**

(b) Justify the following statements. **07**

i) Kaizen paves the way for employee involvement.
ii) Quality is the responsibility of every employee of an organization.
iii) Systematic cleaning and sanitation schedule implementation in food processing industry helps to build up customer confidence.
iv) Inspection is end pipe approach.
v) Competition in the market is one of the drivers for the quality.
vi) AGMARK is product quality standard.
vii) An organization needs vision.

Q.2 (a) Examine the frequency distribution of weights (in g) of 'Milk Cream' packets sampled randomly from a large lot: **07**

Class Interval	5-10	11-20	21-30	31-40	41-50
Frequency	02	18	35	36	09

Calculate the following:

(i) The average weight of the 'Milk Cream' Packet in g.
(ii) Median of the distribution.
(iii) The value of the most frequently occurring observation.
(iv) Range of the distribution.
(v) The average deviation of packet weight from its mean value.
(vi) The variance of the packet weight.

(b) Answer the following questions to the point: **07**

(i) Explain the significance of 'Control' in sensory evaluation?
(ii) Explain terminal threshold with an example.
(iii) Explain the scope and application of 'Triangle Test'. Why is it considered more efficient than 'Duo-trio Test'?
(iv) A closed bag contains 20 apples out which 8 are defective. Four apples are drawn one by one. What is the probability that all the four samples drawn are non-defective?
(v) For a simple random data set represented as "Z = {3, 2, 5, 2, 1, 4, 2, 2, 4, 3, 3, 2}", calculate mean & mode.
(vi) Define Poisson's distribution.
(vii) Calculate the degrees of freedom enjoyed by a Normal distribution.

OR

(b) Define statistical hypotheses. Discuss simple and composite hypotheses with relevant examples and define Null Hypotheses? State the possible conclusions that can be drawn during any statistical hypotheses test process? What are the errors likely to occur? Explain with example which type of error is considered more risky in quality control and why? **07**

Q.3 **(a)** For a random variable, the probability density function is expressed as follows: **07**

$$p(x) = \frac{2}{\sqrt{\pi}} e^{-4x^2} \quad ; \qquad -\infty < x < \infty$$

(i) Identify the distribution.
(ii) Determine the value of mean, standard deviation and variance.
(iii) Write down important properties of such a distribution and state its significance.

(b) Write brief notes on Any Seven of the following: **07**

(i) t-test (ii) Binomial distribution
(iii) Degrees of freedom (iv) Linear Regression
(v) Point estimation (vi) Non-parametric tests
(vii) α and β errors (viii) Interval Estimation technique.
(ix) Criteria for good estimators

OR

Q.3 **(a)** A granulated solids dosing equipment was attached to a soft drink processing and bottling line which produces standard 200 ml bottles. The dosing equipment was set to provide 15% of the total solids in the beverage. The system was operated to produce a test lot of 5000 bottles. Ten samples were randomly picked up from this lot for analysis. The % total solids in each bottle was found to be 14%, 16%, 15%, 13%, 12%, 15% , 20%, 14%, 16%, & 17%. By using appropriate statistical technique, find out the dosing equipment meets the set point requirements. Also, state the properties of the statistical technique used. **07**

(b) Write brief notes on Any Seven of the following: **07**

(i) Fiducial limits (ii) Non-parametric tests. (iii) Two-tailed test
(iv) Regression analysis (v) UMVUE (vi) ANOVA technique
(vii) Sampling distribution (viii) Interval Estimation" technique.
(ix) Laws of probability

Q.4 **(a)** Draw diagrammatic representations for the following TQM models. **07**

i) Transition TQM model (ii) Interactive TQM model
iii) Customer Retention model

(b) Explain the functions of quality control department in food processing industry. **07**

OR

Q.4 **(a)** What are the advantages of quality auditing? Discuss the different types of audit based on scope and time frame? **07**

Q.4 **(b)** How HACCP helps in food safety? Enlist seven principles of HACCP. **07**

Q.5 **(a)** What do you understand by 5'S concept? Explain how it is useful in food industry. **07**

(b) Write short notes on the followings. 1. SWOT Analysis 2. Customer Window **07**

OR

Q.5 **(a)** Highlight on the development of ISO 9000 series standard and its present status. Explain Management responsibility and Product realization requirement. **07**

(b) Differentiate between the followings **07**

i) Quality Management system and Food Safety Management system
ii) Codex Alimentarius commission and Bureau of Indian Standards.

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