

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – WINTER • 2014****Subject Code: 171402****Date: 02-12-2014****Subject Name: Food Standards and Quality Assurance****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)** Define 'Sensory Evaluation' and 'Control'. Explain by giving suitable examples how can this be used for the following applications: **07**
- (i) New product development (ii) Quality Control
(iii) Packaging development. (iv) Cost reduction
(v) Shelf-life studies
- (b)** Answer the following questions: **07**
- i) Define quality control with reference to food products.
ii) What is APHA standard?
iii) Differentiate between cleaning and sanitation with example.
iv) Suggest measures to make a food processing facility pest proof?
v) State benefits of empowering employees?
vi) Define systems approach in TQM?
vii) State limitations of chlorine as disinfecting agent.
- Q.2 (a)** Explain the following with suitable examples/applications: **07**
- (i) Duo-trio test (ii) r-index (iii) Dilution Number
(iv) Hedonic evaluation (v) Fiducial limits (vi) Binomial distribution
(vii) β – Risk in QC
- (b)** Examine the following statements and state if they are TRUE/FALSE giving justification: **07**
- (i) $H: \mu = 8$ & $\sigma^2 = 10$ is a simple hypothesis.
(ii) For a symmetrical distribution, Mean < Mode < Median.
(iii) Bell-shaped distributions are normal distributions.
(iv) For binomial distribution, Variance > Mean.
(v) A sufficient estimator is always consistent and efficient.
(vi) χ^2 - distribution is a multi-modal curve.
(vii) Poisson's distribution is used for small sample sizes.
- OR**
- (b)** Differentiate between simple and composite hypothesis with examples. What possible conclusions can be drawn while testing a statistical hypothesis H_0 which completely or partially specifies a probability distribution? Explain Type-I and Type-II errors and their practical importance in QC terminology? **07**
- Q.3 (a)** Discuss the important features of Food Safety and Standards Act, 2006. Give the name of agencies which have been empanelled by FSSAI for inspection/ auditing of FBOs?" **07**
- (b)** Define TQM and enlist eight quality management principles of TQM. Discuss any two principles in detail stating their application. **07**

OR

- Q.3 (a)** Discuss the Deming's wheel along with its features. In what way 'Do' is different from 'Act' in Deming's wheel? **07**
- (b)** What is Integrated TQM Model? Explain customer focus model in TQM. **07**
- Q.4 (a)** Explain the following terms: **07**
- Customer Window
 - Functions of Quality control
 - C_p and C_{pk} values of a process
 - Advantages of 5'S concept
 - Six Sigma Quality concept
- (b)** Write differentiating notes on the following: **07**
- Cleaning and sanitation
 - ISO 9001:2008 and ISO 22000:2005
 - Quality in yesteryears and Quality in today's times.
- OR**
- Q.4 (a)** Write brief notes on the following and mention their applications. **07**
- Quality Assurance
 - Kaizen technique
 - HACCP
 - Vision and Mission of an organization
 - Interactive TQM model
- (b)** What is AGMARK? Which agency governs it? Explain its importance in Indian food processing industry. What do FPO and BIS stand for? **07**
- Q.5 (a)** Write explanatory notes on the following and mention their applications: **07**
- Good statistical estimators
 - Normal distribution
 - Point estimation technique
 - ANOVA technique
 - χ^2 - Test
- (b)** What is t-test? State its types, properties and applications. **07**
- OR**
- Q.5 (a)** Write explanatory notes on the following and mention their applications: **07**
- Regression analysis
 - Degrees of freedom
 - Properties of normal distribution
 - F-Test
 - UMVUE
- (b)** State practical applications of t-test. Ten packed cartons containing filled pouches of a snack food were picked up randomly from an automatic carton filling machine. The average weight of 10 cartons was found to be 12.54 kg and the standard deviation was found to be 0.14 kg. Analyze mathematically, if the sample mean differs significantly from the intended carton weight of 12 kg. **07**
- [For $\alpha = 5\%$, d.f. = 9, take t-value = 2.26]
