

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- VII EXAMINATION-SUMMER 2023****Subject Code: 3171404****Date: 26/06/2023****Subject Name: Food Packaging Technology****Time: 10:30 AM TO 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. Simple and non-programmable scientific calculators are allowed.

- Q.1 (a)** State the effect of followings on their respective packaging materials characteristics. **03**
- i) Addition of ethylene during polypropylene manufacturing
 - ii) Addition of carbon as minor additive during glass manufacturing
 - iii) Addition of Manganese as alloying element in aluminum container manufacturing
- (b)** Compare the characteristics of thermoplastic with thermo-sets. **04**
- (c)** Explain the concept of PAISE with respect to food packaging. **07**
- Q.2 (a)** List out the advantages and limitations of glass as food packaging material. **03**
- (b)** Differentiate between thermoform blister packaging and cold form blister packaging. **04**
- (c)** Discuss the factors affecting on tin plate corrosion. Suggest the remedies to reduce or minimize the corrosion of tin plate container. **07**
- OR**
- (c)** Define Aseptic Packaging. Discuss the important components of aseptic packaging. **07**
- Q.3 (a)** State the active component in the following packaging materials. **03**
- i) Oxygen scavenging film
 - ii) Ethylene scavenging film
 - iii) Anti-microbial film
- (b)** Briefly explain the different types of label used in a food industry. **04**
- (c)** Define Edible packaging. Explain the different mechanisms used for edible film formation. **07**
- OR**
- Q.3 (a)** Elaborate the regulatory meaning for the following food product claims. **03**
- i) Good source of nutrient
 - ii) Reduced calories
 - iii) Trans fat free
- (b)** Enlist the mandatory information to be mentioned on food product label as per FSSAI Food Packaging & Labeling regulations. **04**
- (c)** Draw a well labeled diagrammatic representation of low vacuum filling system. Explain the operation principle and working of low vacuum filling system. **07**

- Q.4 (a)** How CPET is different from PET plastic grade? Write the applications of CPET in a food industry. **03**
- (b)** Calculate the bursting strength of 5 ply corrugated fiber board box from the following given data. **04**
 Liner : 220 GSM of 24 BF paper
 Flute : 170 GSM of 22 BF Paper
- (c)** Explain the properties and applications of polyamide in food packaging. **07**
- OR**
- Q.4 (a)** Differentiate between Low Density Polyethylene and High Density Polyethylene. **03**
- (b)** Suggest the most suitable plastic packaging material grade for the following food products. **04**
 i) Dehydrated garlic
 ii) Frozen Vegetable
 iii) Retort package for Indian curries
- (c)** A metal cylinder (40 cm diameter and 75 cm height) is used to fill the bulk milk powder (Particle density 600 kg/m^3) with a porosity of 52%. If in one cylinder 5 kg extra milk powder is filled. Calculate the percent increase or decrease in the porosity. **07**
- Q.5 (a)** What do you understand by FFS machine? List out the important components of FFS machine. **03**
- (b)** What are factors to be considered for developing a successful food package? **04**
- (c)** Discuss the paper manufacturing process with the significance of each step. **07**
- OR**
- Q.5 (a)** Highlight on the important properties of the following paper grade. **03**
 i) Kraft paper
 ii) Glassine paper
 iii) Parchment paper
- (b)** Highlight on the advantages and limitations of aluminum container with respect to food packaging. **04**
- (c)** What do you understand by Half Value Period (HVP) in shelf life estimation of food product? Explain the important factors affecting on the shelf life of dehydrated food product. **07**
