

ROLL NO: _____

M.TECH FOOD TECHNOLOGY
SEMESTER III EXAMINATION, 2019
PAPER TITLE- FOOD PACKAGING
PAPER CODE: MFTG-307

TIME: 3HOURS

MAX. MARKS: 75

Attempt all questions. Marks are mentioned against each question.

Q1. (A) Fill in the blanks

(1x5=5)

- (a) The molding temperature of glass bottles is _____.
- (b) Carbon and sulphide are added to make _____ glass.
- (c) In modified atmosphere packaging of **processed meat products**, the gas mixture commonly used is _____ %CO₂ and _____ % N₂.
- (d) A type of controlled atmosphere storage where the storage area is maintained under reduced pressure and high humidity is known as _____.
- (e) The chemicals used in kraft process of paper manufacturing are _____ & _____.

(B) Select the most appropriate answer in the following

(1x5=5)

(a) ASTM stands for:

- i) African Society for Testing & Manufacturing
- ii) American Society for Testing & Materials
- iii) Australian Society for Testing & Materials
- iv) None of these

(b) Which one of the following is the technical function of package?

- i) To promote the product
- ii) To display information
- iii) To protect the product
- iv) To motivate the consumer

(c) Now-a-days bread is usually packed in

- (i) HDPE bags
- (ii) LDPE bags
- (iii) Polystyrene
- (iv) None of the above

(d) China clay is used in paper manufacture as

- (i) Bleaching agent
- (ii) Sizer
- (iii) Filler
- (iv) None of these

(e) What has been banned for tea bag products by FSSAI from 2018?

- (i) Use of stapler pins
- (ii) Thread for dipping
- (iii) Cloth bag containing the tea leaves
- (iv) Herbal tea leaves

(C) Answer in about 20-30 words

(1x5=5)

- (a) Define stress concentrator in terms of a glass?
- (b) What is BOPP?
- (c) Name the layers with their use in the making of a Tetra Pak?
- (d) Define WVTR?
- (e) Enlist the types of TTI's available commercially?

Q2. Attempt any three of the following

(3x5=15)

- (a) Explain in detail the tinning process used in manufacture of metal cans for packaging of different food products?
- (b) What is aseptic packaging? Which chemicals are used to sterilize packaging material before aseptic packaging?
- (c) Define food packaging? Discuss briefly the main functions of food packaging?

(d) Give the classification of food packaging materials? Explain in detail any one of the flexible packaging materials used in food industry?

(e) Define paper as a packaging material? Briefly explain the different types of paper used in food industry?

Q3. Answer briefly (any two)

(2x7.5=15)

(a) Give in detail the classification of TTT's? List out the requirements for TTT's to be used in the food industry?

(b) Derive theory of permeability using Henry's law of solubility and Fick's law of diffusion considering permeability model for gas or vapor transfer through a polymer?

(c) Define active packaging? Explain with examples the active packaging techniques used in food packaging systems and their respective food applications?

(d) Write a short note on intelligent packaging systems? Give its types and briefly discuss about the Quality indicators used in food industry?

Q4. Attempt any three of the following

(3x5=15)

(a) What are lacquers? Give in detail the types of lacquers and importance of lacquering in packaging of food stuffs?

(b) What are edible films? Explain briefly the types of edible films and their role in maintaining eco-friendly environment?

(c) Draw a well labeled diagram of a glass bottle? Briefly explain the properties of glass to be considered as a packaging material for foods?

(d) What do you understand by the term 'shelf-life'? Give an account of the methods used for prediction of shelf-life of foods?

(e) Give an account of Packaging systems used for meat and meat products?

Q5. Write short notes on any three of the following

(3x5=15)

(a) Biodegradable Packaging.

(b) Vacuum Packaging.

(c) Time-temperature indicators to optimize distribution and stock rotation.

(d) Laminated plastic materials

(e) Closures and its types