

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 2923

L

Unique Paper Code : 2172513602

Name of the Paper : DSC : Food Additives, Contamination and Safety

Name of the Course : B.Sc. (Prog.) Industrial Chemistry

Semester : VI

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **four** questions.
3. **All** questions carry equal marks.

1. (a) Find out the correct option from the following :

(i) Which of the following statements correctly explains the role of FSSAI in India?

- (a) It regulates only food imports
- (b) It ensures food safety and sets standards
- (c) It controls agricultural production
- (d) It regulates only packaged food

(ii) Which preservative works by inhibiting microbial enzyme activity?

- (a) Sodium benzoate
- (b) Starch
- (c) Glucose
- (d) Lactose

P.T.O.

(iii) Identify the synthetic food colour from the following :

- (a) Curcumin
- (b) Chlorophyll
- (c) Tartrazine
- (d) Carotene

(iv) Which heavy metal contamination is associated with neurological toxicity?

- (a) Iron
- (b) Zinc
- (c) Lead
- (d) Calcium

(v) Which antioxidant primarily prevents lipid oxidation in food systems?

- (a) Ascorbic acid
- (b) BHA
- (c) Water
- (d) Glucose

(b) Discuss in detail the classification of food additives based on their functions, with suitable examples.

(c) Explain the mechanism of action of antioxidants in preventing oxidative spoilage of food products. (5,5,5)

2. (a) Explain the different types of food contaminants (physical, chemical, and biological) with detailed examples and sources.

(b) What are pesticide residues? Discuss their sources, health impacts, and methods to minimize their presence in food.

- (c) Elaborate on environmental pollutants and describe how they enter and accumulate in the food chain. (5,5,5)
3. (a) Describe the chemistry, antimicrobial action, and industrial applications of sulphur dioxide and sulphites in food preservation.
- (b) Discuss in detail the chemistry of natural and artificial sweeteners, including their metabolic effects, advantages, and limitations.
- (c) Compare natural, synthetic, and nature-identical food colours with respect to stability, safety, and applications. (5,5,5)
4. (a) Define food adulteration and explain how it differs from contamination with suitable examples.
- (b) Describe any three common food adulterants, their sources, and their harmful effects on human health.
- (c) Explain in detail various household and laboratory methods used for detection of adulterants in milk, turmeric, and chilli powder. (5,5,5)
5. (a) Explain the components of food risk analysis including risk assessment, risk management, and risk communication.
- (b) Discuss the importance of food safety regulations and their role in ensuring consumer protection and quality control.
- (c) Differentiate between (**any two**) with explanation :
- (i) Class I and Class II preservatives
- (ii) Acute and chronic toxicity studies
- (iii) ADI and LD50 (5,5,5)

6. (a) Define solvent residues and explain their origin during food processing along with their potential health hazards.
- (b) Describe the formation of nitrosamines in food systems and discuss the factors affecting their formation and associated risks.
- (c) Discuss the occurrence, formation, and health implications of polycyclic aromatic hydrocarbons (PAHs) in processed foods. (5,5,5)