

## JAMIA HAMDARD

Department of Medical Elementology & Toxicology

School of Chemical and Life Sciences

**Course Name: BSc (Hons.) Toxicology, Semester-I End term Examination (2022-23)**

Paper Name: Food contaminants and their analysis

Paper Code: BTX-SEC-101

Time: 2h

Maximum Marks: 45

Note: This paper has 3 section A, B and C, Attempt all the three sections.

*Section A: Answer all the questions; Section B: Answer any 3 out of 5; Section C: Answer all the questions, each question has an internal choice*

Abbreviations Used

CO-Course Outcome, PO-program Outcome, BTL-Bloom Taxonomy Level: BT level 1-Remember; BT level 2-Understand; BT level-3 Apply; BT level 4 Analyze; BT level 5- evaluate, BT level 6 Create

### SECTION A

**Very Short Type Questions**

**(Marks 1×15=15)**

| Q. No. | Question                                                                                                                                                                                                                                      | Marks | BTL- | CO | PO |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|----|----|
| 1.     | Food contaminant may be regarded as every substance not _____ added to the food, but found inside the food during the production process, farming practices, treatment, packaging, transport, storage of food, or from environmental sources. | 1     | 2    | 1  | 1  |
| 2.     | _____ may be the main food contaminant during the cleaning process of the food.                                                                                                                                                               | 1     | 1    | 2  | 1  |
| 3.     | _____ are produced inadvertently during the incomplete combustion of organic material and has carcinogenic effects.                                                                                                                           | 1     | 1    | 2  | 1  |
| 4.     | _____ compounds are formed during rubber processing, are present in metal working fluids and are inadvertently present in foodstuffs including smoked foods, preserved meats, and some alcoholic beverages.                                   | 1     | 2    | 1  | 1  |
| 5.     | _____ is an aryl amine that forms during the cooking of meat, especially at high temperatures and possibly carcinogenic to humans.                                                                                                            | 1     | 3    | 4  | 2  |
| 6.     | _____ contamination is the most significant in terms of microbial food poisoning and foodborne illnesses.                                                                                                                                     | 1     | 1    | 2  | 1  |
| 7.     | _____ often occurs if food is stored at the wrong temperature, at high humidity or beyond its recommended shelf-life.                                                                                                                         | 1     | 2    | 1  | 1  |

|     |                                                                                                                                                     |   |   |   |   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|
| 8.  | _____ is the state of being impure or unfit for use due to the introduction of unwholesome or undesirable elements.                                 | 1 | 4 | 3 | 1 |
| 9.  | Chromatography is defined as a process by which solutes are separated by a dynamic differential _____ in a system consisting of two or more phases. | 1 | 2 | 1 | 1 |
| 10. | Gas chromatography is used to separate _____ organic components in a mixture.                                                                       | 1 | 3 | 4 | 2 |
| 11. | Write the full form of HPLC.                                                                                                                        | 1 | 2 | 1 | 1 |
| 12. | Write the full form of LC-MS.                                                                                                                       | 1 | 2 | 1 | 1 |
| 13. | Name any detector used in HPLC.                                                                                                                     | 1 | 2 | 1 | 1 |
| 14. | Is DTA a thermal method of method of analysis?                                                                                                      | 1 | 3 | 4 | 2 |
| 15. | Write the equation mentioning the relation between energy and frequency of electromagnetic wave.                                                    | 1 | 1 | 2 | 1 |

### SECTION B

Long type Question (Attempt any two out of four)

(Marks 2×10=10)

| Q. No. | Question                                                                                                                                                                                                         | Marks | BTL | CO | PO |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|----|----|
| 1.     | What are important analytical techniques used in food contamination analysis. Describe the gas chromatography method.                                                                                            | 10    | 5   | 5  | 3  |
| 2.     | What are the food contaminants and their sources? Describe the contamination of food during various steps of food processing.                                                                                    | 10    | 4   | 3  | 1  |
| 3.     | Calculate the pH in a solution prepared by dissolving 0.070 mol of acetic acid and 0.035 mol of sodium acetate in water and adjusting the volume to 500.0 mL. acetic acid, $K_a = 1.76 \times 10^{-5}$ at 25 °C. | 10    | 4   | 3  | 1  |
| 4.     | Describe the procedure to prepare an acetate buffer of pH 4.                                                                                                                                                     | 10    | 5   | 5  | 3  |

### SECTION C

Short-type Questions. Attempt any four questions.

(Marks 2.5×4=10)

| Q. No. | Question                                                                                   | Marks | BTL | CO | PO |
|--------|--------------------------------------------------------------------------------------------|-------|-----|----|----|
| 1.     | Calculate molarity of a solution which concentration is 2mg/mL. MW of solute is 387 g/mol. | 2.5   | 2   | 1  | 1  |
| 2.     | What do you understand by PPM and % (w/v).                                                 | 2.5   | 2   | 1  | 1  |
| 3.     | Explain the various ways in which food may get contaminated.                               | 2.5   | 4   | 3  | 1  |
| 4.     | What are the carcinogenic food contaminants?                                               | 2.5   | 2   | 1  | 1  |
| 5.     | What is the principle of UV-visible spectroscopy?                                          | 2.5   | 5   | 5  | 3  |

-: End of the paper :-