10. a. What are industrial and domestic importance of food preservatives? Mention different physical and chemical methods employed for food preservation. 2+3=5

b. What are important roles of enzymes in food production and processing? What are the advantages of using enzymes compared to traditional chemical processes, in food industries? Provide four examples of enzymes used in food applications. 2+2+2=6

c. What is the need of sugar substitute in food applications? Provide two examples of sugar substitute. 2+1=3

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PG Even Semester Examination, May 2025

CHEMISTRY

(2nd Semester)

Course No.: CHM-556

(Chemistry in Everyday Life)

Full Marks: 70

Pass Marks: 28

Time: 3 hours

The figures in the right margin indicate full marks for the question. Answer any five questions selecting one from each unit.

UNIT-I

1. a. How gold was extracted and its purity was checked in ancient India 2+2=4

b. Discuss the atomic theory given by Acharya Kanada 5

c. Discuss how dyes and soaps were used in ancient India. 3+2=5

2. a. Explain how various pieces of evidence help in establishing that Indians manufactured glass in ancient times. 5

b. What is Panchamahabhuta in Ayurveda? How the theory of Panchamahabhutaholds good at the atomic level. 1+3=4

c. Write a short note on the dola and damaruyantra used in Ayurveda? 5

UNIT-II

3. a. Define a chemical weapon of mass destruction. Discuss the historical background of chemical warfare. 2+3=5

   b. Write notes on the following i) Agent orange, ii) Sulfer mustered iii) Phosgene. 3×3=9

4. a. What is OPCW? What is the role of OPCW? What are the declaration require from states related to chemical industry according to CWC? 1+2+3=6

   b. Define nuclear weapon of mass destruction. What is critical mass of fissile material? 2+1=3

   c. Write notes on blood agents and biological weapons. 2x½×2= 5

UNIT-III

5. a. Outline five key guidelines to ensure the safe storage and handling of hazardouschemical waste. 7

   b. Identify seven concise factors contributing to the toxic nature of nanomaterials. 7

6. a. Enumerate four essential guidelines for the proper disposal of nanomaterial waste. Additionally, clarify the distinction between nanomaterial residues in the milligram range and those exceeding this threshold. 4+2+2=8

   b. Describe the sequential procedure for the safe disposal of carcinogenic waste materials. 6

UNIT-IV

7. a) Present a tabulated summary outlining the appropriate storage practices for thefollowing categories of hazardous substances: (i) compressed flammable gases, (ii) peroxide-forming compounds, (iii) oxidizing agents, (iv) compressed oxidizing gases, and (v) toxic or poisonous substances. The table should include relevant storage symbols, representative chemical examples, and known incompatibilities for each category. 10

   b. Describe a notable international industrial incident involving the release of hexavalent chromium [Cr(VI)], and discuss its environmental, health, and regulatory consequences. 4

8. Succinctly outline fourteen critical protocols specific to Chemistry Research Laboratories that students and researchers must strictly follow to maintain safety, accuracy, and regulatory compliance. 14

UNIT-V

9. a. What is the importance of food colouring agents in food industries? What are the important types and chemical classes of natural food colours? Provide one example of each class with structure. 2+2+2=6

   b. What is Food browning? How is it classified? Discuss the chemical process involved in Maillard Reaction. How non-enzymatic food browning can be controlled? 2+1+3+2=8