# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **ALLIED**

FOURTH SEMESTER – **NOVEMBER 2022**

**UCH 4401 – APPLIED CHEMISTRY FOR MATHS**

Date: 26-11-2022 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

## PART-A

***Answer ALL questions.*** **(10 × 2 = 20 Marks)**

1. What first aid should be administered for the injury caused by the following chemicals?
   (i) methanol (ii) nitric acid
2. The results of an analysis are found by analyst to give 36.89 % of a metal compared to the true value of 36.98 %. What is the relative error?
3. Identify the indicators for the following titrations. Justify your answer.
   (i) $H_2SO_4$ *vs* NaOH (ii) HCl *vs* $Na_2CO_3$
4. Find the mole fraction of ethanol in the mixture containing 10.0 g of water and 10.0 g of ethanol.
5. Show that amino acids exist in zwitter ionic form with an example.
6. Classify the following carbohydrates as mono, di and polysaccharides. Justify your answer.
   (a) sucrose (b) cellulose
7. Differentiate soaps from detergents.
8. List the primary functions of cosmetics.
9. Write the BIS specifications of drinking water.
10. Mention the significance of dissolved oxygen in water.

## PART- B

***Answer ANY EIGHT questions.*** **(8 × 5 = 40 Marks)**

11. Discuss the importance of material safety data sheets in a laboratory.
12. Explain the types of errors encountered in analytical measurements.
13. List the rules to be followed in handling and storing chemicals in laboratory.
14. Calculate the molality, normality and molarity of sulphuric acid solution containing 84 g of sulphuric acid in 100 g of water. The density of the solution is 1.196 $gcm^{-3}$.
15. What are primary standard substances? Mention their prerequisites with examples.
16. Describe any two tests with relevant equations to identify the presence of carbohydrates.
17. Define saponification value of an oil. How is it determined?
18. Specify the role of consumer redressal forum.
19. Explain the cleansing action of soap.
20. Describe the reverse osmosis method to purify water.
21. What are temporary and permanent hardness of water? How can be they removed?
22. Describe the significance of chemical oxygen demand measurement in polluted water.

## PART- C

***Answer ANY FOUR questions.*** **(4 × 10 = 40 Marks)**

23. a) The following results were obtained in the replicate determination of the lead content of a blood sample: 0.752, 0.756, 0.754, 0.753, 0.752, 0.751 and 0.760 ppm of Pb. Calculate the mean, standard deviation and coefficient of variation for the data.
    b) Define precision and accuracy. (7+3)
24. Explain the principle of complexometric titrations and mention the role of metallochromic indicators in complexometric titrations.
25. Discuss the types, sources, functions and deficiency diseases of water soluble vitamins.
26. Explain the classification of the following with suitable examples. (5+5)
    (i) lipids (ii) amino acids
27. Mention the properties and chemical formulation of any one type of shampoo.
28. Define air pollution. Explain the causes, effects and prevention of air pollution.

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