

- (b) What is the role of an indicator in titration ? Why is it important to know the pH range of an indicator ? **3**

Unit III

6. (a) What is the purpose of preparing EDTA solutions in complexometric titrations ? Describe the steps involved in preparing a 0.01 M EDTA solution. **3**
- (b) Why is the proper management of chemical waste important for laboratory safety and the environment ? What are the common methods for segregating chemical waste in a laboratory ? **4**
7. (a) What are the key principles behind the process of distillation ? How do simple distillation and fractional distillation differ ? **3**
- (b) What factors affect the purity and yield of a substance during crystallization ? **2**

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B.A. (NEP-2020) EXAMINATION, 2025

(Second Semester)

B23-SEC-219

Chemistry Lab Maintenance and Handling

Time : 3 Hours]

[Maximum Marks : 35

Before answering the question-paper, candidates must ensure that they have been supplied with correct and complete question-paper. No complaint, in this regard will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) What precautions should be taken when handling volatile chemicals ?

- (b) How does Sodium react with water ?
- (c) What is the basicity of an acid (e.g., H_2SO_4) ?
- (d) Give the name of any chemical which is used as primary standard in laboratory.
- (e) What types of compounds are typically purified by sublimation ?
- (f) Which of the following is a monobasic acid and why ? H_3PO_2 or H_3PO_3 .
- (g) What is the principle of operation of a conductometer ? $7 \times 1 = 7$

Unit I

- 2. (a) Why is it important to familiarize yourself with the labeling of chemicals ? **3**
- (b) What precautions should be taken when same handling volatile chemicals ? **3**
- (c) How should you inspect glassware for safety before use ? **1**

- 3. (a) Why must sodium metal be handled with caution and what is the recommended method for disposing of small amounts of sodium metal in a laboratory setting ? **3**
- (b) Differentiate between normality, molality, and molarity. **3**
- (c) How do you prepare a solution of a given concentration (e.g., 250 ml 1 M HCl) ? **1**

Unit II

- 4. (a) What is the difference between the concentration and percentage purity of a solution ? **3**
- (b) Why is standardization of solutions necessary in chemical analysis ? Describe the steps involved in the standardization of a sodium hydroxide solution. **4**
- 5. (a) Give examples of common primary and secondary standards used in titrations and explain their key properties. **4**

- (c) What precautions should be taken to avoid loss of material during sublimation ? 2

Unit IV

8. (a) Why are platinum electrodes often used as inert electrodes in redox reactions ? 2
- (b) What are the advantages of using an Ag/AgCl electrode over a saturated calomel electrode (SCE) ? 2
- (c) What is the working principle of a pH meter ? Describe the step-by-step procedure for calibrating a pH meter using buffer solutions. 3
9. (a) What is the principle of operation of a potentiometer ? How is a potentiometer calibrated and why is calibration necessary ? 3
- (b) What is the working principle of a potentiometer in electrochemical measurements ? Describe the procedure for calibrating a potentiometer. 4



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