B. Sc. Chemistry Examination, 2023

(4th Semester)

CHEMISTRY (SEC)

Paper: SEC/Chem/TH/02

Time : Two Hours　　　　　　　　　　Full Marks : 40

UNIT : SEC02-I

1. Answer *any five* questions :　　　　　　　4×5

   a) What do you mean by constant error and proportional error? How are they related to absolute error and relative error?　　　2+2

   b) What do you mean by population standard deviation and sample standard deviation? Mention their differences, if any. Discuss significance of degrees of freedom in case of sample standard deviation.

   　　　　　　　　　　　　　　　2+1+1

   c) Calculate the i) mean; ii) median; iii) spread and iv) coefficient of variation of the following data set 0.612, 0.592, 0.694, 0.645 and 0.680.　　1+1+1+1

   d) Discuss direct titration, back titration and indirect titration with suitable examples with respect to estimation of metal ions by EDTA.　　2+1+1

   e) Discuss use of the following with appropriate reactions/structures.　　$2\frac{1}{2}+1\frac{1}{2}$

      (i) dimethylglyoxime　(ii) 8-hydroxy-quinoline

[Turn over

f) Discuss the criteria for choice of organic reagents in inorganic analysis. 4

g) Discuss major constituents of soil. Discuss briefly the procedure for the determination of soil pH. 2+2

2. Answer the following questions (in brief): 5×1

a) Write the significance of colored bins for environmental management.

b) Determination of dissolved metal ions by complexometric titration.

c) Discuss the rate of Reverse Osmosis (RO) in water purification.

d) Write down the name of green and red colorants used as food colour.

e) What is the role of DDT in depleting biodiversity?

3. Answer *any three* questions : 3×5

a) How is solubility of oxygen measured? Write down the chemical reactions involved. What will happen to life in water for decrease in pH to strongly acidic state? How does chemistry help to manage it?

1+2+1+1

b) What is food adulteration? Write about its impact on human health. Write down the name of adulterants and their identification in coffee powder, red chilli and asafoetida. $1+1\frac{1}{2}+2\frac{1}{2}$

c) Write down the names of two major components present in deodrant. Explain the role of deodrant on health. Determine the concentration of zinc and boric acid present in it. 1+1+3

d) Write down the traditional techniques of food preservation. Mention names of two food preservants used in modern industrial techniques and their role. Account for the role of benzoic acid as a food preservant and determine quantitatively its presence in a food. $1\frac{1}{2}+1+2\frac{1}{2}$

e) Write short notes on (*any two*) : $2\times2\frac{1}{2}$

i) Eutrophication: cause and effect

ii) Food pyramid

iii) Role of Al(III) in human health

iv) Rain water harvesting