B. Sc. (Chemistry) Examination, 2022

(2nd Year, 2nd Semester)

CHEMISTRY

Paper – SEC/Chem/TH/02

[Errors in Chemical Analysis; Use of organic reagaents; Analysis of soil; Analysis of water, Food products, Cosmetics and Other applications]

Time : Two hours | Full Marks : 40

UNIT – SEC02-I

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

   a) Compare between $2\frac{1}{2}\times 2$

      i) Precision and Accuracy

      ii) Selective reaction and Specific reaction

   b) Name three types of systematic errors. How are systematic method errors detected? 1+4

   c) Define i) Variance, ii) Coefficient of variation, iii) Spread, iv) Constant Error and v) Population mean

   d) Calculate the i) mean; ii) median; iii) spread; iv) standard deviation and v) coefficient of variation of the following data set

      0.612, 0.592, 0.694 and 0.700

   e) i) How can you detect traces of nickel in cobalt-salts using DMG? Write reactions. $2\frac{1}{2}$

ii) Discuss briefly how different forms of EDTA are dependent on the pH of the medium. $2\frac{1}{2}$

f) Discuss briefly the composition of soil air. Discuss with reactions how they are dependent on aerobic and anaerobic respiration and decomposition of organic matter. 1+4

2. Answer the following questions in brief. 1×5

a) Which radiation is used for microbial purification of water?

b) What do the Red-Bin and Brown-Bin kept in front of a medical centre signify?

c) What is TDS? Mention its standard value for drinking water.

d) Write down the name and structure of common black colouring hair dye? How does it work?

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

3. Answer ***any three*** questions: 5×3

a) What is the dissolved oxygen content of standard drinking water? Distinguish between BOD and COD. Describe the principle of measurement of DO. $1+1\frac{1}{2}+2\frac{1}{2}$

b) Write down the structure of the monomer unit of PVC. Where is it used? Why is PVC harmful? How could it be prevented? $1+1+1\frac{1}{2}+1\frac{1}{2}$

c) What is food value? Name the regulating agency of food quality in India and in the World. What types of adulterants are added to milk? How do you identify them? 1+1+1+2

d) Write down the name of toxicants generally present in agricultural waste? How do they impact 'Eutrophication'? How do you determine them? 1+2+2

e) Why is O_2 in cell toxic? How does biology regulate them? Why can pigeons fly for long times? 2+2+1

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

i) Role of Al(III) in human health

ii) Determination of food preservatives

iii) Role of saltification of food