TDP (General) 5th Semester Exam., 2019

CHEMISTRY

(General)

PAPER - DSE - I(A)

Full Marks : 60 Time : 3 Hours

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Group - A

1. Answer any *six* questions : 6×2=12

   (a) Write the significant figures of each of the following numbers (i) 6.030 (ii) 0.02670

   (b) Write the full form of HPLC and GPC?

   (c) What happens when a molecule is irradiated with infrared radiation?

   (d) Name two elements which are more sensitive to flame atomic absorption than flame atomic emission spectroscopy.

[Turn Over]

(e) What is thermogram?

(f) What is pH?

(g) Give an example of selective solvent extraction of metal ion.

(h) What do you mean by eluent and elution?

Group - B

Answer *four* questions taking *one* question from each unit. 12×4=48

Unit - I

2. (a) What do you mean by sampling? What is the difference between random and systematic sampling?

(b) What is normal law of distribution? Write its characteristics.

(c) Write the types of errors with examples. (2+2)+4+4=12

3. (a) Write the mathematical expression of Lambert Beer's law.

(b) Name two lamps which are used in UV-vis spectrophotometer, indicating their wave length regions.

(c) What are the advantages of double beam system over single beam system of UV-vis spectrophotometer?

(d) Which of the following has greater λ_{max} value in UV-vis spectrum?

$Ph - CH = CH - Ph$ and $Ph - CH = CH - CH = CH - Ph$ 2+4+3+3=12

Unit - II

4. (a) Describe with diagram of a single-pass monochromator used in IR spectroscopy.

(b) What are the characteristics of IR radiation source in IR spectrophotometer?

(c) Write the basic function of the following in IR spectrophotometer :

(i) Detector

(ii) Recorder

(iii) Amplifier (3+2)+2½+4½=12

5. (a) What is atomic absorption spectroscopy? Describe its basic principle.

   (b) What are the differences between flame atomic absorption spectroscopy and flame atomic emission spectroscopy. (2+5)+5=12

Unit - III

6. (a) What do you mean by thermogravimetric analysis? Explain the basic principle of if.

   (b) How thermogravimetry can be used to estimate *Ca* and Mg in a mixture of $CaCO_3$ and $MgCO_3$? (2+5)+5=12

7. (a) Define equivalent conductivity and molar conductivity. Write their units. How the two terms are related to each other?

   (b) Discuss the factors affecting the conductance of a solution.

   (c) Calculate the pH of 0.05 M *HCl* and 0.05 M CH_3COOH solutions [Given K_a for $CH_3COOH = 1.75\times10^{-5}$] 5+2+5=12

Unit - IV

8. (a) Write the principle of solvent extraction.

   (b) Name two types of solvent extraction techniques and explain.

   (c) For same volume of extractant why more number of extraction is preferred over single extraction?

   4+(2+4)+2=12

9. (a) What is chromatography? Write the basic principle of chromatography.

   (b) Classify liquid chromatography based on different operation technique.

   (c) Write three applications of GC or CC.

   (1+3)+5+3=12
