

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]

(2)

- (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.

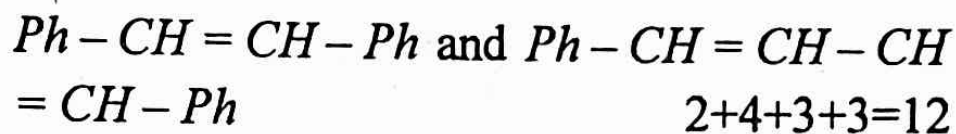
12×4=48

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.

(3)

- (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?



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

[Turn Over]

(4)

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 it.
- (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 $CH_3COOH = 1.75 \times 10^{-5}$] 5+2+5=12

(5)

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.
 $(1+3)+5+3=12$
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