SHRI S.H.KELKAR COLLEGE OF ARTS, COMMERCE AND SCIENCE, DEVGAD.
(SINDHUDURG)
S.Y.B.Sc. SEMESTER I EXAMINATION MARCH 2023

COURSE: Analytical Chemistry **COURSE CODE – USCH403**
TIME : 8:30 am to 11:30 am **MAX. MARKS: 100**
SET: A **DURATION: 3 HOURS**

N.B. 1.All the questions are compulsory
2. Figures to the right indicates full marks
3. The use of log table/Programmable calculators are allowed.

Q. 1 A) Select the correct option and complete the following statement. **(12)**

i)Electrophoresis is a …….. method.

a)seperation. b)electroanalytical. c)thermal

ii) …… is a chemical method for seperation.

a)precipitstion. b)centrifugation. c)filteration

iii)Solvent extraction is governed by ……law

a)Nerst Distribution law b)Beer's law. c)Boyle's law

iv)Chromatography consist of …….. phase.

a) three. b)two. c)Infinite

v) A……..Is that electrode whose potential is known and remains constant.

a)Reference electrode b)Indicator electrode c) pH electrode

vi) …….is that electrode whose potential change during the course of titration.

a)SCE b) Reference electrode c) Indicator electrode

vii) In pH titrimetry…….of solution changes during the course of titration.

a)Conductance b)pH c) Potential

viii) The unit of cell constant is…….

a)Volt b)gm c)S cm^{-1}

ix) The overall shape of normal error curve represents…….of the given set of measurements.

a) Uncertaint b) Accuracy c) Precision

x) The variance is given as…..

a)S/X b)s^2 b) Scm^{-1}

xi) Determinate error are also known as……

a)Systematic error b)Random error c) Gross error

xii) Null hypothesis is often used as.....

a)Test of repeatability b) Test of significance c) Test of uncertainty

B) State whether the following statements are TRUE or FALSE. **(03)**

i) Partition coefficient and distribution coefficient ratios are always same.

ii) The glass electrode is known as ion selective electrode.

iii) Mode is a measure of dispersion of the data.

C)Match the following **(05)**

Sr. No.	Column A	Column B
i)	Electrophoresis	Ion selective electrode
ii)	Solvent Extraction	Siemen
iii)	Glass Electrode	two immisible liquid
iv)	Unit of Conductance	seperation of protein
v)	Indeterminate error	Scm^{-1}
		Random error
		S/X
		Measure of dispersion

Q. 2) Attempt any FOUR of the following.

A.What are the different types of seperation method? Explain any two in details. **(5)**

B.Describe the preparation of plates used in TLC.What are the other steps involved in TLC? **(5)**

C.(i)Explain seperation factor. **(2)**

(ii)When 0.1 dm3 of an aqueous solution containing 0.2 g of substance S is extracted with 0.5 dm3 of ether layer was found to contain o.186 g of S .Calculate distribution ratio of the ether. **(3)**

D.Explain any two types of distillation method. **(5)**

E.Explain briefly the principle of solvent extraction method. **(5)**

F.What are the criteria for selection of an extracting solvent.? **(5)**

Q. 3) Attempt any FOUR of the following.

A. Explain basic principle of potentiometric titration on basis of Nernst's distribution law **(5)**

B. With neat labelled diagram describe construcrion and working of conductivity cell **(5)**

C. Discuss application of pH metry in titration of strong acid against strong base **(5)**

D. With help of graph explain methods of determination of equivalence point. **(5)**

E.Define the terms: (a) indicator electrode (b) reference electrode **(5)**

F.Describe with neat diagrams the conductometric titration (5)

(a) Strong acid vs Strong base

(b) Strong acid vs Weak base

Q. 4) Attempt any FOUR of the following.

A.Explain different ways for minimization of error. (5)

B.Describe Gaussian distribution curve with its silent features. (5)

C.Define terms mean, mode, median. How they represent measure of central tendency? (5)

D.Explain Q test (5)

E.Calculate the mean and the median for following sets of values (5)

Set-A 6.10, 6.12, 6.14, 6.10, 6.12, 6.14

Set-B 18.30, 18.28, 18.32, 18.27, 18.28

F.Following are the results obtain by percentage of silver from analysis of same sample. From the given data in two sets, verify whether two standard deviations are same or different. (5)

Set-I 15.72, 15.68, 15.76

Set-II 15.62, 15.80, 15.67

Q. 5) Attempt any FOUR of the following.

A.The distribution ratio of D is 10 in favour of organic solvent for particular system. Calculate the percentage extraction for volume ratio Vo/Vm of

(i) 1 (ii) 10 for single extraction. (5)

B.Explain the term chromatography .Give the classification of chromatographic method on the basis of nature of phases involved in it. (5)

C.Give advantages and disadvantages of conductometric titrations. (5)

D.Explain principle of pH meter. (5)

E.Write a note on null hypothesis. (5)

F.With help of example explain correlation between two variables. (5)