VCD 10/10/19 CHEMISTRY P-III S.Y.B.Sc SEM-IV ATKT Oct 2019
MARKS:100 TIME : 3 Hrs

NOTE: i) All the questions are compulsory.
ii) Figures to right indicate full marks.
iii) Use of non –programmable calculator / log table is allowed.

Q1. A. Fill in the blanks with suitable option (any 12) (12)

i. _____ is used as mobile phase in Thin layer chromatography.
a. Liquid b. gas c. both a and b

ii. Liquid- liquid chromatography is based on _____.
a. Adsorption b. sublimation c. partition.

iii. Centrifugation is a _____ method of separation.
a. Chemical b. physical c. mechanical

iv. Liquid fuels are separated by _____
a. Fractional distillation b. chromatography c. steam distillation

v. Crystallization is a _____ method of separation.
b. Chemical b. physical c. mechanical

vi. Paper chromatography is _____ type of chromatography
a. Adsorption b. partition c. ion exchange.

vii. _____ electrode is used as a reference electrode.
a. Saturated calomel b. platinum c. hydrogen

viii. The glass electrode is an _____ electrode
a. Ion specific b. ion selective c. reference

ix. Null hypothesis is often used as a test of _____
a. repeatability b. significance c. uncertainty

x. _____ measures electrochemical properties of the analyte.
a. Colorimeter b. potentiometer c. spectrophotometer

xi. The unit of conductance is _____
a. S b. S cm^{-1} c. cm^{-1}

xii. Glass electrode is used in _____
a. potentiometer b. conductometer c. pH meter

xiii. Glass electrode is an example of _____ electrode.
a. Metal-metal ion b. redox c. membrane

xiv. For rejection of a result _____ test is used.
a. F- test b. least square method c. Null hypothesis

xv. Gaussian curve is _____
a. Bell shaped b. closed curve c. simple closed curve

xvi. Least square method is used for _____
a. obtaining best fitting line b. testing of significance c. rejection of data

xvii. Variance ratio test is also known as _____
a. F – test b. Q – test c. both a and b

xviii. The difference between highest and lowest numerical value is called ____
a. Deviation b. range c. standard deviation

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Q1. B. State true or false (any three) (03)

i. Distillation is a chemical method
ii. Mean is not average of all the values.
iii. Glass electrode is used in pH.
iv. pH meter can be used for water analysis
v. A test rejected by 2.5d rule cannot be retained by 4.0 d rule
vi. Crystallization is a chemical method of separation

Q1. C. Match the columns (any five) (05)

Column A	Column B
i. Potentiometry	a. Separation technique
ii. Chromatography	b. Solvent extraction
iii. Conductivity cell	c. Confidence limit
iv. Nernst distribution law	d. Reference electrode
v. CnR	e. Platinum electrode
vi. 4.0 d rule	f. Combination of result
	g. Rejection of result
	h. Quinhydrone electrode

Q.2. Attempt the following (any four) (20)

A. List the applications of HPLC
B. What is the principle involved in separation based on TLC?
C. How is distillation used for separation of two liquids?
D. Give the principle of zone electrophoresis. What are its applications?
E. What are the different types of distillations?
F. 500 cm^3 of water contains 100mg of an acid. It is shaken with 50 cm^3 of organic solvent. 20 mg of acid is unextracted. Calculate the distribution ratio of acid between water and organic solvent.

Q.3. Attempt the following (any four) (20)

A. Discuss the conductometric titration curve of weak acid vs strong base.
B. List the advantages and limitations of conductometric titrations.
C. State the principle of pH metry. What are its applications?
D. Explain the construction of glass electrode with a neat labelled diagram.
E. Explain the basic principle of potentiometric titration.
F. What are merits and demerits of quinhydrone electrode?

Q.4. Attempt the following (any four) (20)

A. What is null hypothesis? Explain the variance ratio test.

B. Six samples were analyzed for its mercury content. The values obtained are 2.06, 2.16, 2.12, 1.93, 1.89 and 1.95. Calculate mean, median and mode.
C. Explain the Q-test for rejection of data.
D. Explain the 2.5 d rule.
E. Define: mean, median, mode, variance and average deviation.
F. Describe the method of averages with respect to linc equation $y = mx + c$.

Q.5. Attempt the following (any four) (20)

A. Describe continuous extraction process of solvent extraction when organic solvent is lighter than water.
B. List the applications of Paper chromatography
C. Discuss the advantages and limitations of potentiometric titrations.
D. What are the merits and demerits of glass electrode?
E. Following values were obtained in a sample analysis 4.6, 4.7, 4.5, 4.9. on the basis of Q test, find whether 4.9 can be rejected or retained. (Given $Q_{table} = 0.76$)
F. Explain the 4.0 d rule.