

SEAT No. _____

[95 E36]

SARDAR PATEL UNIVERSITY
B.Sc. EXAMINATION
Fifth Semester (CBCS)
US05CCHE24 Analytical Chemistry

No. of printed pages: 04



Date: 29-12-2020, Tuesday

Time: 2.00 to 4.00 pm

Maximum Marks: 70

Q-I Multiple choice Questions.

[10]

- Which type of metal is used in hydrogen electrode?
(a) Reactive (b) Highly reactive (c) Inert (d) Alkaline
- What is the formula of Ohm's law?
(a) $I = E/R$ (b) $R = I/E$ (c) $I = E R$ (d) $R = I E$
- Dilution effect is seen on the _____.
(a) Conductance (b) Specific conductance
(c) Equivalent & molecular conductance (d) All of the above
- The Value of R_F (Retention Factor / Migration Parameter) depends upon _____.
(a) Solvent used (b) Temperature (c) Nature of mixture (d) All of above
- The development of paper is done by allowing the solvent to travel up the paper is known as _____ chromatography.
(a) Ascending - descending (b) Descending (c) Ascending (d) Two dimensional
- _____ is not used as stationary phase in thin layer chromatography.
(a) Silica (b) Alumina (c) Glass (d) Methanol
- Which type of column is used in Gas Chromatography?
(a) capillary column (b) packed column
(c) support coated packed column (d) all of these
- Which of the following gas is used as carrier gas in Gas Chromatography?
(a) bromine (b) iodine (c) nitrogen (d) chlorine
- Multiple extraction is _____ efficient as compared to single extraction.
(a) More (b) less (c) equal (d) more or less
- The greater the distribution ratio in favour of organic solvent, the _____ will be amount extracted in any one operation.
(a) Lesser (b) Equal (c) Greater (d) All of these

Q-II Fill in the blanks.

[08]

- Antimony electrode can be used in the pH range of _____.
(4 to 12 / 3 to 9)
- In potentiometry, during acid-base titration, _____ graph is plotted?
($\Delta E/\Delta V \rightarrow V$ / $\Delta E/\Delta V \rightarrow P$)
- The number of theoretical plates (N) refers to _____.
(Height of a layer of column / Measure of column efficiency)
- The porous medium without any movement through which mixture move is called _____. (Moving phase / Stationary phase)
- Identify the significant property of Helium as carrier gas.
(inertness/ reactivates)
- In gas chromatography, the mobile phase used is gas but stationary phase can be _____. (Solid & Liquid / Liquid & Gas)
- In solvent extraction, masking agent is also known as _____.
(synergistic agent / synergetic agent)
- For the study of distribution law, two solvent must be _____.
(a) miscible (b) immiscible (c) volatile (d) reactive to each other

[1]

Q-III Short answer questions. (Attempt any TEN)

[20]

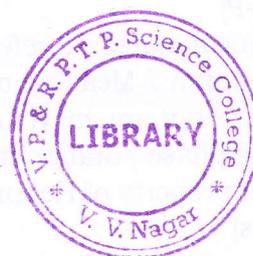
- 1 What is specific resistance and specific conductance?
- 2 Discuss advantages of Hydrogen Gas Electrode.
- 3 Discuss limitations / disadvantages of Quinhydrone Electrode.
- 4 What is migration parameter / retention factor?
- 5 What is cation and anion exchange resins?
- 6 Discuss factors affecting efficiency of column chromatography.
- 7 Name any three detectors used in chromatography.
- 8 Discuss solvent delivery system used in HPLC.
- 9 What carrier gas? Also give examples.
- 10 What is solvent extraction?
- 11 Give the limitations of distribution law.
- 12 What is modifier used in solvent extraction?

Q-IV Long Answer Questions. (ATTEMPT ANY FOUR)

[32]

- 1 Discuss Graphical method for determination of end point in acid-base titration.
- 2 Write a note on Antimony Electrode with its advantages and limitations.
- 3 Discuss all the types of paper chromatography.
- 4 Give experimental details of thin layer chromatography.
- 5 Write a note on Flame ionization detector and Electron Capture detector.
- 6 Write a note on column used in GC /HPLC.
- 7 Discuss batch extraction and continues extraction. **Solve:** The partition ratio between water and organic solvent is 0.5. Calculate the volume of organic solvent required to extract 80% of solute from 1000 ml 1M aqueous solution.
- 8 Derive a relation for amount of solute unextracted after 'n' number of operation.

Solve: In presence of dithiozane and at pH=6, a metal X gets 95% extracted with 'v' ml of methylene chloride to 'V' ml of aqueous solution. Under the same condition metal 'Y' is 5% extracted. Calculate the efficiency of separation of metal 'X' and 'Y'. Given that volume of aqueous layer and organic layer are same.



[2]