

Name:
Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2022

Course: Principles of Analytical Chemistry
Program: MSc Chemistry
Course Code: CHEM7004

Semester: I
Time : 03 hrs.
Max. Marks: 100

Instructions:

- Attempt all the questions.
- Internal choice is given for Q 4 of Sec B and Q1 of Sec C.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Calculate the pH of the following solutions (i) 0.365 g/L HCl (ii) 0.001 M Ba(OH) ₂	4	CO1
2	Briefly explain the principles of chromatography and classify the chromatographic methods	4	CO1
3	Define redox-potential and give its significance	4	CO4
4	Give Bronsted theory of acid and bases with few examples	4	CO2
5	Explain how nickel ions will be precipitated with DMG using reactions	4	CO3

SECTION B
(4Qx10M= 40 Marks)

Q 1	(A) Find the pH of 0.002 N acetic acid solution, if it is 2.3% ionized at a given dilution (B) Give Henderson equation and give its significance	5+5	CO2
2	(A) Explain how chloride ions can be estimated using silver nitrate by gravimetric method. Use appropriate chemical reactions (B) Give details about physiological buffers with few examples.	5+5	CO2
3	(A) Discuss the principle, development of method and applications of TLC technique. (B) TLC is more superior than paper chromatography. Justify.	6+4	CO1
4	(A) Describe the following which are used in column chromatography with example (i) Stationary phase (ii) mobile phase	5 +5	CO1

	<p>(B) Write notes on precipitating reagents used in gravimetry with examples</p> <p style="text-align: center;">OR</p> <p>(A) How to choose an organic or inorganic solvent for chromatography and discuss few examples</p> <p>(B) Explain how inorganic ions will be separated by paper chromatography with examples</p>		
<p>SECTION-C (2Qx20M=40 Marks)</p>			
Q 1	<p>(A) Enumerate the principles of solid-phase micro extraction and its limitations</p> <p style="text-align: center;">OR</p> <p>Listout the various devices used for solid phase micro extraction with illustrations.</p> <p>(B) Mention the advantages of redox indicators and give few examples and give their structures</p> <p style="text-align: center;">OR</p> <p>Draw redox-titration curves for titration between strong acid and strong base and give necessary explanation.</p>	10 + 10	CO4
2	<p>(A) Explore the below mentioned titrations methods involving EDTA with suitable diagram and reactions.</p> <p style="text-align: center;">(i) Back and (ii) direct</p> <p>(B) Draw the acid-base titration curves of the following with explanation (i) strong acid Vs. strong base (ii) strong base Vs weak acid</p>	10 + 10	CO3