


Name:			
Enrolment No:			
<b>UNIVERSITY OF PETROLEUM AND ENERGY STUDIES</b> <b>End Semester Examination, May 2022</b>			
<b>Course: Principles of Analytical Chemistry</b> <b>Program: BSc Chemistry</b> <b>Course Code: CHEM1019</b>		<b>Semester: II</b> <b>Time : 03 hrs.</b> <b>Max. Marks: 100</b>	
<b>Instructions:</b> <ul style="list-style-type: none"> <li>• Attempt all the questions.</li> <li>• Internal Choices are given for question number 9 &amp; 10</li> </ul>			
<b>SECTION A</b> <b>(5Qx4M=20Marks)</b>			
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) <sub>2</sub>	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	Discuss Bronsted theory of acid and bases with few examples	4	CO2
5	Discuss how nickel ions will be precipitated with DMG using reactions	4	CO3
<b>SECTION B</b> <b>(4Qx10M= 40 Marks)</b>			
Q 6	(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
7	(A) Discuss how chloride ions can be estimated using silver nitrate by gravimetric method. Use appropriate chemical reactions (B) Discuss physiological buffers and give few examples.	5+5	CO2
8	(A) Discuss the principle, development of method and applications of TLC technique in Industry (B) Explain how TLC is more superior than paper chromatography.	6+4	CO1
9	(A) Describe the following which are used in column chromatography with example (i) Stationary phase (ii) mobile phase (B) Write notes on precipitating reagents used in gravimetry with examples		CO1

	<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><b>SECTION-C</b> <b>(2Qx20M=40 Marks)</b></p>			
Q 10	<p>(a) Discuss the principles of solid-phase micro extraction and its limitations</p> <p style="text-align: center;"><b>OR</b></p> <p>Discuss the various devices used for solid phase micro extraction with illustrations.</p> <p>(b) Discuss the advantages of redox indicators and give few examples with their structures</p> <p style="text-align: center;"><b>OR</b></p> <p>Discuss redox-titration curves for titration between strong acid and strong base</p>		<b>CO4</b>
11	<p>(a) Discuss the below mentioned titrations methods involving EDTA citing suitable diagram and reactions.</p> <p style="text-align: center;">(i) Back and (ii) direct</p> <p>(b) Discuss the acid-base titration curves of the following</p> <p style="text-align: center;">(i) strong acid Vs. strong base (ii) strong base Vs weak acid</p>		<b>CO3</b>