Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth semester B.Tech examinations (S), September 2020

Course Code: CH208
Course Name: CHEMISTRY FOR PROCESS ENGINEERING II (CH)

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any two questions. Each question carries 15 marks.

1 a) Give the principle of potentiometry? How would you determine the equivalence points of complexation titration potentiometrically?   6

   b) Write a note on (a) Diffusion current (b) Half wave potential (c) Residual current with the help of neat polarogram?   6

   c) Explain the principle of Auger electron spectroscopy   3

2 a) Give the principle, instrumentation and applications of Scanning Tunnelling Microscopy (STEM)?   6

   b) What are main components of Atomic emission spectrometer?   4

   c) Explain the principle and applications of Coulometric titrations.   5

3 a) Draw the working of mass spectrometer with the help of a neat schematic diagram?   5

   b) Describe the working principle and applications of Anodic Stripping Voltammetry   6

   c) Explain the instrumentation of Atomic Force Microscopy?   4

PART B
Answer any two questions. Each question carries 15 marks

4 a) Derive Nernst distribution law from thermodynamic considerations. Write any two applications of the distribution law.   7

   b) Explain important postulates of Arrhenius theory of electrolytes?   3

   c) Write a note on Parke's process.   5

5 a) What is critical solution temperature? Draw the triethyl amine – water system with the help of neat diagram   5

   b) Explain asymmetric effect and electrophoretic effect?   6

   c) Explain concentration cell with transference?   4

6 a) Give the principle and important applications of steam distillation?   6

   b) Explain (1) Biosensors (2) Gas sensors   4

	c)	Define transport number? How the transport number is determined by Hittorf's methods?	5

PART C
Answer any two questions. Each question carries 20 marks.

7	a)	What is adsorption isotherm? Give the mathematical expression for Freundlich adsorption isotherm at different pressure conditions?	4
	b)	Derive Gibbs adsorption isotherm?	8
	c)	Give the classification of colloids with example based on size?	3
	d)	What are surfactants? Explain its uses?	5
8	a)	Explain (a) Zeta potential (b) Dorn effect	5
	b)	State important postulates of Langmuir adsorption isotherm?	5
	c)	Explain liquid drop model of nucleus?	5
	d)	Explain radio carbon dating and isotope effects?	5
9	a)	What do you mean by neutron activation analysis?	6
	b)	Describe transient and secular equilibria?	6
	c)	What are radioactive tracers? Discuss the important applications	4
	d)	Write the important applications of medicinal isotopes?	4