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GIET UNIVERSITY, GUNUPUR - 765022
M. Sc (Third Semester) Regular Examinations, December - 2023
22CHPC301 - Analytical Chemistry-I
(Chemistry)

Time: 3 hrs

Maximum: 70 Marks

(The figures in the right hand margin indicate marks.)

PART – A**(2 x 10 = 20 Marks)**Q.1. Answer *ALL* questions

	CO #	Blooms Level
a. What is thermal analysis and classify the physical and chemical changes.	CO1	K1
b. Draw the block diagram of TGA curve.	CO1	K2
c. Differentiate Between Voltametry and Polarography.	CO2	K1
d. Mention the advantages of Dropping mercury electrode.	CO2	K1
e. Draw the diagrammatic representation of X-ray instruments.	CO3	K1
f. Calculate the angle which (i) first order reflection (ii) Second order reflection will occur in a X-ray spectrometer when X-ray of wave length 1.54 \AA are diffracted by the atoms of a crystal given that the inter planner distance of 4.04 \AA .	CO3	K2
g. A 0.5 g of coal sample on ultimate analysis produced 1.60 g of CO_2 and 0.225 g of water. Find out the percentage of carbon and hydrogen of sample.	CO4	K1
h. Write the application of gas chromatography.	CO4	K2
i. Explain limiting Current.	CO2	K1
j. Classify fuels on the basis of state of aggregation	CO1	K1

PART – B**(10 x 5=50 Marks)**Answer *ANY FIVE* questions

	Marks	CO #	Blooms Level
2. a. Write the Principle and Instrumentation of TGA curve.	5	CO1	K1
b. Explain power compensation DSC.	5	CO1	K2
3.a. Write the Principle and Instrumentation of DTA.	5	CO1	K1
b. Write the application of TGA curve.		CO1	K2
4. a. Write the Principle components and Instrumentation of Cyclic Voltammetry.	5	CO2	K2
b. Derive Bragg's law.		CO3	K1
5.a. There are two analyst x & y who determine the percentage of the Paracetamol in the same brand of tablet. The standard value of Paracetamol in that tablet is 100 % and observations are given below: Analyst x: 99.80, 99.90, 100, 99.30 Analyst y: 98.75, 98.75, 98.80, 98.80 Who has done more accurate analyst?	5	CO3	K2

b.	Differentiate between Voltametry and Polarography.	5	CO2	K1
6. a.	Explain types of Error.	5	CO4	K1
b.	Explain Residual Current and Migration Current.	5	CO4	K1
7.a.	Calculate the angle which (i) first order reflection (ii) Second order reflection will occur in a X-ray spectrometer when X-ray of wave length 1.54 \AA are diffracted by the atoms of a crystal given that the inter planner distance of 4.04 \AA .	5	CO3	K2
b.	For first order diffraction by a crystal plane having $d = 2.3 \text{ \AA}$ in a solid observed at the angle of 30° . Using the same radiation and first order diffraction, $\Theta = 60^\circ$ for another solid. Calculate the d value of second solid.	5	CO3	K2
8. a.	Explain different types of Amperometric titration.	5	CO1	K1
b.	A coal having following composition by weight C= 90%, O= 0.3%, N=0.5%, ash=2.5%, S=0.5%. The NCV=8925.28 K cal/K.g calculate % H & GCV.	5	CO1	K1