QP Code: R253G051 | Reg. No | | | | | | | | | | | AY 24

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET UNIVERSITY)

M.Sc. (Third Semester – Regular) Examinations, December – 2025

24MCYPC23001 - Analytical Chemistry – I

(Chemistry)

Time: 3 hrs | Maximum: 60 Marks

Answer ALL questions
(The figures in the right hand margin indicate marks)

PART – A **(2 x 5 = 10 Marks)**

Q.1. Answer ***ALL*** questions		CO #	Blooms Level
a.	Write note on Accuracy and Precision.	CO1	K1
b.	Draw the DTA curve of Calcium oxalate monohydrate.	CO2	K2
c.	Write Ilkovic equation.	CO1	K1
d.	For first order diffraction by a crystal plane having d = 2.3 A° in a solid observed at the angle of 30°. Using the same radiation and first order diffraction, Θ = 60° for another solid. Calculate the d value of second solid.	CO4	K4
e.	Explain Eschka method (Determination of Sulphur).	CO5	K5

PART – B **(10 x 5 = 50 Marks)**

Answer ***ALL*** the questions		Marks	CO #	Blooms Level
2. a.	Find out mean, median, mode and standard deviation of 2,3,0,1,2	5	CO3	K3
b.	Classify six types of determinate Errors.	5	CO2	K2
	(OR)			
c.	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	CO4	K4
d.	Write note on minimization of Errors.	5	CO3	K3
3.a.	Write the Principle, Instrumentation of TGA curve	5	CO2	K2
b.	Write the Instrumentation and application of DTA.	5	CO3	K3
	(OR)			
c.	Explain power compensation DSC.	5	CO3	K3
d.	Write principle and factors of DSC curve.	5	CO4	K4
4.a.	Write the Principle, components and Instrumentation of Cyclic Volatmetry	5	CO2	K2
b.	Explain Residual Current, Diffusion Current, and Migration Current.	5	CO3	K3
	(OR)			
c.	Explain different types of amperometric titration.	5	CO2	K2

d.	Write the working and block diagram of DC polarography	5	CO3	K3
5.a.	Calculate the angle which (a) first order reflection &(b) Second order reflection will occur in a X-ray spectrometer when X-ray of wave length 1.54 A° are diffracted by the atoms of a crystal given that the inter planner distance of 4.04 A°.	5	CO4	K4
b.	Explain working, principle and instrumental part of Scanning Tunneling microscopy.	5	CO5	K5
	(OR)			
c.	Explain working, principle and instrumental part of Scanning electron microscope	5	CO4	K4
d.	Derive Bragg's law.	5	CO3	K3
6.a.	Explain Ultimate analysis (C,H)	5	CO1	K1
b.	2.5 g of dried air coal sample was taken in silica crucible, after heating it in an electric oven at 105-110° C for one hour, the residue was weighted in silica crucible covered with vented lid at temperature 950 to 20°C for exactly 7 minute. After cooling weight of residue was found to be 1.78 g. the residue was then ignited at 700-750°C to constant weight of 0.2469 g. calculate percentage of fixed carbon in a coal sample.	5	CO3	K3
	(OR)			
c.	Explain the principle of Gas chromatography and also write some points on mobile and stationary phase.	5	CO2	K2
d.	Explain Kjeldahl's method (Determination of Nitrogen)	5	CO4	K4

--- End of Paper ---