BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: MSC / IMSC / PRE-PHD **SEMESTER : II/VIII**
BRANCH: CHEMISTRY **SESSION : SP/2023**

SUBJECT: CH412 ANALYTICAL CHEMISTRY

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	What are determinate and indeterminate errors? Explain with examples of your choice. Outline the concept of sample spiking technique of third-party inspection. Elaborate with example of your choice.	[5]	I	Understand
Q.1(b)	Compare and contrast population and sample standard deviation with relevant mathematical expressions. Which among the two is (i) more accurate (ii) more practical. Human error can be both determinate as well as indeterminate. Elaborate.	[5]	I	Analyze
Q.2(a)	Compare and contrast tubular column and capillary column of GC. Highlight their advantages and disadvantages.	[5]	II	Analyze
Q.2(b)	Explain with clear illustration the concept of 2D TLC. What is its advantage over normal TLC? Elaborate the application of crown ethers in selective extraction of metal ions.	[5]	II	Understand
Q.3(a)	Outline the Mohr's method of estimation of chloride in a sample solution. Write all relevant chemical equations. What precautions needs to be taken?	[5]	III	Remember
Q.3(b)	Outline the gravimetric procedure of estimation of oil and grease in a given water sample. Briefly explain the concept of co-precipitation.	[5]	III	Analyze
Q.4(a)	Explain thermometric titration. Describe the instrumentation and procedure of thermometric titration with the help of schematic diagram.	[5]	IV	Apply
Q.4(b)	Compare and contrast between DTA and DSC. Explain DSC curve of a polymer with the help of graph.	[5]	IV	Analyze
Q.5(a)	Describe briefly the construction and working of Quinhydrone electrode with the help of diagram. Derive its pH in acidic and basic medium.	[5]	V	Remember
Q.5(b)	Differentiate between pH-metric and conducto-metric titration. Draw and explain the conductometric titration curve for following: (i) Weak acid vs Strong base (ii) Weak acid vs weak base	[5]	V	Understand

::::::27/04/2023::::::E