

**FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, MARCH 2020**

(CUCSS)

Chemistry

CH 4C 12—INSTRUMENTAL METHODS OF ANALYSIS

Time : Three Hours

Maximum : 36 Weightage

**Section A**

*Answer all questions.*

*Each question carries a weightage of 1.*

1. Distinguish between accuracy and precision.
2. What is student 't' test ?
3. Explain with example colour change interval in acid base titration.
4. In the titration of  $\text{Fe}^{2+}$  against  $\text{KMnO}_4$  in acid medium,  $\text{Cl}^-$  ions should be avoided. Why ?
5. What are the advantages of dropping mercury electrode in polarography ?
6. What is differential pulse polarography ?
7. Explain with example biamperometry.
8. Name two sources used in IR spectrometers.
9. What is nebulization ?
10. Distinguish between electron spectroscopy and electronic spectroscopy.
11. What is the experimental parameter measured in (a) DTG ; (b) DSL ?
12. What is meant by 'size exclusion chromatography' ?

(12 × 1 = 12 weightage)

**Section B**

*Answer any eight questions.*

*Each question carries a weightage of 2.*

13. The following data were obtained for x-y plot. Find the slope and intercept by linear least square method :

$x$	:	0.001	0.002	0.003	0.004	0.005	0.006
$y$	:	20.60	20.72	20.82	20.93	21.03	21.15

14. The solubility of a sparingly soluble salt  $A_2X_3$  is  $5 \times 10^{-5}$  moles per litre. Find the solubility product. What would be the solubility of the salt in  $10^{-2}$  M solution of  $X^{3-}$  ?
15. Draw the potential-volume curve for a redox titration with the help of one example. Discuss.
16. Discuss the working of a biocatalytic electrode.
17. Briefly discuss chronopotentiometry as an analytical technique.
18. Discuss the advantages of fluoremetry over *uv*-visible spectrophotometry.
19. Briefly discuss instrumentation in XRF.
20. Discuss one method of measuring gamma radiation.
21. How would you select column for GC ? Discuss.
22. Briefly discuss ion exchange chromatography.
23. How would you select indicator for nonaqueous titration ? Explain.
24. With the help of one example discuss organic polarography.

(8 × 2 = 16 weightage)

### Section C

*Answer any two questions.*

*Each question carries a weightage of 4.*

25. Discuss instrumentation in AAS.
26. What is neutron activation analysis ? Discuss.
27. Discuss theory and applications of HPLC.
28. Write a brief account of organic precipitating agents in gravimetry.

(2 × 4 = 8 weightage)