20P411 (Pages: 2) Name: ……..…….…...

Reg. No…….

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2022

(CBCSS - PG)

(Regular/Supplementary/Improvement)

CC19P CHE4 C12 - INSTRUMENTAL METHODS OF ANALYSIS

(Chemistry - Core Course)

(2019 Admission onwards)

Time: Three Hours Maximum: 30 Weightage

Section A

Answer any ***eight*** questions. Each question carries 1 weightage.

1. What is a determinate error? How you ascertain whether it is constant or proportionate?
2. Define the terms 'mean deviation' and relative mean deviation'.
3. What is meant by 'aging of precipitate'? Explain.
4. Bring out the functioning of an adsorption indicator with a suitable example.
5. What is diffusion current? Explain its significance in polarography.
6. If the absorbance value of potassium chromate solution is 0.762, calculate the percentage of radiation absorbed by it.
7. What are chemical interferences in AAS?
8. What do you mean by X-ray powder diffraction pattern? Explain.
9. What is the principle of Auger electron spectroscopy?
10. What is the principle of TLC?

(8 × 1 = 8 Weightage)

Section B

Answer any ***six*** questions. Each question carries 2 weightage.

11. A sample metal chloride on analysis showed the percentage of metal as: 32.72, 32.78, 32.98, 32.84 and 32.79. Calculate (a) Mean deviation (b) Standard deviation and (c) Co-efficient of variation.
12. Write briefly on the method of least squares for the treatment of analytical data.
13. Differentiate between co-precipitation and post-precipitation. How do they affect quantitative analysis? How they can be avoided?
14. Write a note on biosensors.
15. Write briefly on coulometric titrations.
16. Differentiate between nephelometry and turbidimetry.
17. Write briefly on spectrophotometric titrations.
18. Discuss the principle of neutron activation analysis.

(6 × 2 = 12 Weightage)

Section C

Answer any ***two*** questions. Each question carries 5 weightage.

19. Discuss the principle and instrumentation of polarography. How this technique can be used in quantitative analysis?
20. Explain the principle, instrumentation and applications of a double beam spectrophotometer. What is meant by the term 'signal to noise ratio' in a spectrophotometer?
21. Discuss the theory, instrumentation and applications of ESCA.
22. Outline the principle, instrumental set up and applications of HPLC. What are the advantages of HPLC over other methods of chromatography?

(2 × 5 = 10 Weightage)

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