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(FOR THE CANDIDATES ADMITTED
DURING THE ACADEMIC YEAR 2022

ONLY)

SUB CODE **22PCY414**
REG.NO. :

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : MAY-2024

MSc CHEMISTRY

MAXIMUM MARKS: 50

SEMESTER-IV

TIME : 3 HOURS

INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS

SECTION – A

(10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.(K1)

1. What is the number of significant digits in 1559.00 ?

(a) 6 (b) 5 (c) 4 (d) 3

2. Which of the following HPLC pump has limited solvent capacity ?

(a) Reciprocating (b) Displacement (c) Reciprocating dual pumps (d) All of the above
(a) Carboxase (b) Urease (c) Zymase (d) Peptidase

3. What is the range of the rate in $\text{-----}^{\circ}\text{Cmin}^{-1}$ required during the heating process in TGA?

(a) 50-65 (b) 30-40 (c) 1-20 (d) 20-30

4. Which of the following will NOT show electron spin resonance ?

(a) Free radicals (b) Paramagnetic materials (c) Transition metals (d) Diamagnetic materials

5. Choose the Phosphorescence mainly results from _____

(a) Internal conversion (b) Vibrational relaxation (c) Intersystem crossing (d) All of the above

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES

(K2)

6. Distinguish between precision and accuracy.

7. Expand-FID and ECD in chromatography.

8. Define- Auger electron spectroscopy

9. Define-Doppler Effect in Mossbauer spectroscopy.

10. Differentiate between phosphorescence and fluorescence.

SECTION – B

(5 X 3 = 15 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K3)

11. a) List and explain the classification and minimization of errors.

(OR)

b) Compare the student-test and f test.

12. a) Describe the principle of thin layer chromatography
(OR)
b) Describe the principle of ion exchange chromatography

13. a) Compare between-Thermogravimetric analysis and differential thermal analysis
(OR)
b) Describe the description of ESCA spectrometer.

14. a) List and explain the theory and Principle of NQR spectroscopy
(OR)
b) Describe the Kramer's degeneracy in electron spin resonance spectroscopy.

15. a) Compare between Circular Dichroism and Optical rotatory dispersion
(OR)
b) Describe the applications of ORD

SECTION – C **(5 X 5 = 25 MARKS)**
ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.
(K4 (Or) K5)

16. a) Analyze the Statistical treatment- mean and standard deviation.
(OR)
b) Defend the least square method and linear regression

17. a) Discuss the methods and applications HPLC.
(OR)
b) Summarize the Gas chromatography basic instrumental set up.

18. a) Point out the Thermometric titrations basic principles.
(OR)
b) Discuss the X-ray sources, samples, analysis, detectors and recording devices.

19. a) Outline the applications of electron spin resonance spectroscopy.
(OR)
b) Analyze the principle and theory of Mossbauer spectroscopy.

20. a) Discuss the Octant rule and axial halo ketone rules
(OR)
b) Defend the applications of Fluorescence and phosphorescence.

