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(FOR THE CANDIDATES ADMITTED **SUB CODE 23UCY405**

DURING THE ACADEMIC YEAR 2022 ONLY) **REG.NO. :**

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

END-OF-SEMESTER EXAMINATIONS: MAY 2025

B.Sc CHEMISTRY **MAXIMUM MARKS: 75**

SEMESTER: IV **TIME: 3 HOURS**

PART – III

23UCY405 – CC IV: INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY

SECTION - A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS (K1)

1. Elements of which groups are called as d-block elements?

a) groups 1 to 2 b) groups 3 to 12 c) groups 13 to 18 d) groups 13 to 17

2. Identify the process when aryl halide is hydrolyzed to phenol with NaOH.

a) Dow's process b) Wurtz reaction c) Friedel-Crafts reaction d) Williamson process

3. The total number of conformations of ethane is

a) 1 b) 2 c) 3 d) infinite

4. Choose the ideal solution from the following.

a) carbon disulphide and acetone b) phenol and aniline

c) chloroform and acetone d) ethyl iodide and ethyl bromide

5. In which of the following the magic numbers of both protons and neutrons are present.

a) $_{82}Pb^{208}$ b) $_{50}Sn^{108}$ c) $_{82}Pb^{206}$ d) none of these

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES (K2)

6. Write the general electronic configuration of f-block elements.

7. What is meant by nitro-acinitro tautomerism?

8. Define racemization.

9. State Henry's law.

10. Define mass defect.

SECTION – B (5 X 5 = 25 MARKS)

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

11. a) Describe about lanthanide contraction.

(OR)

b) Explain the extraction of uranium from Pitch blende.

12. a) Sketch Reimer-Tiemann reaction with mechanism.

(OR)

b) Write the preparation reactions of nitromethane.

13. a) Explain the distinction between conformation and configuration.

(OR)

b) Show the optical isomerism in lactic and tartaric acids.

14. a) Derive Duhem-Margules equation.

(OR)

b) Write short notes on steam distillation.

15. a) Justify about n/p ratio.

(OR)

b) Summarize the separation and identification of isotopes.

SECTION – C (5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS (K4/K5)

16. a) Illustrate the general comparison of 3d, 4d and 5d elements.

(OR)

b) (i) Explain the comparison between lanthanides and actinides. (4)

(ii) Analyze the separation of lanthanides by ion-exchange method. (4)

17. a) Discuss the following reactions with mechanism. (4+4)

(i)Kolbe's Schmidt reaction (ii) Schotten-Bauman reaction

(OR)

b) Explain the preparation and reduction of nitrobenzene in neutral, acidic and alkaline media.

18. a) Illustrate the separation of mixture of amines.

(OR)

b) (i) Sketch the conformational analysis of cyclohexane. (5)

(ii) Justify the geometrical isomerism in maleic acid. (3)

19. a) Derive Nernst distribution law.

(OR)

b) Discuss phase equilibria in phenol-water system.

20. a) Explain the following. (3+5). (i) half-life period (ii) applications of radioactive series.

(OR)

b) Discuss the principle, components and working of nuclear reactor.