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(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2021–22 ONLY)

SUBJECT CODE 21 UCY 405

REG.NO.

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

END-OF-SEMESTER EXAMINATIONS: MAY – 2023

B.Sc. – CHEMISTRY **MAXIMUM MARKS: 70**

IV SEMESTER **TIME: 3 HOURS**

PART – III

INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY

SECTION - A (10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.

MULTIPLE CHOICE QUESTIONS. (K1)

1. Zinc and mercury do not show variable valency like d-block elements because of _____.

   a) Cu^{+} b) Co^{2+} c) Ni^{2+} d) Fe^{2+}

2. On heating aqueous solution of Benzene diazonium chloride, which of the following is formed?

   a) Benzene b) Chlorobenzene **c)** Phenol d) Aniline

3. What is the correct name for a molecule that has two Amino groups in opposing (para) locations around a benzene ring?

   a) Benzenediamine b) Benzene-1, 4-diamine

   c) p-Aminoaniline d) 4-Aminobenzenamine

4. The change of phase from liquid to vapour is _____.

   a) Condensation b) Evaporation c) Sublimation d) None of these

5. Radioactive has an unstable nucleus and undergoes radioactive decay _____.

   a) Isotope b) Atom c) Radioisotope d) None of these

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

6. Which elements are called f-block elements?
7. Write the natural sources of nitro compounds?
8. Why are they called Stereoisomerism?
9. Define Gibbs-Phase rule.
10. List any four magic numbers.

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SECTION – B (5 X 4 = 20 MARKS)

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

11. a) Explain the trend in atomic size of 3d series of transition elements with the reason.

(OR)

b) On the basis of Lanthanide contraction, explain the following

i) Nature of bonding in Lu_2O_3 and La_2O_3

ii) Stability of the complexes of lanthanides.

12. a) Write the preparation of phenol from cumene.

(OR)

b) What is the product when $C_6H_5CH_2NH_2$ reacts with HNO_2?

13. a) Distinguish between conformation and configuration with example

(OR)

b) Explain geometrical isomerism

14. a) Construct and explain about the phase diagram of Sulphur system.

(OR)

b) Derive thermodynamically the Gibb's phase rule

15. a) Discuss the significance of radioactive half-life period.

(OR)

b) Compare the nuclear fission and fusion.

SECTION – C (4 X 10 = 40 MARKS)

ANSWER ANY FOUR OUT OF SIX QUESTIONS
(16th QUESTION IS COMPULSORY AND ANSWER ANY THREE QUESTIONS (FROM Qn. No: 17 to 21) (K4 (Or) K5)

16. Describe lanthanide and actinides.
17. Explain the method of extraction of Uranium from Pitch Blende.
18. Elaborate the Conformational analysis of n- Butane.
19. Outline the Meta and Para nitrobenzene.
20. Construct the KI-H_2O system.
21. Analyze how a nuclear reactor works?

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ETHICAL PAPER