(NO. OF PAGES: 2)

(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2023 ONLY)

SUB CODE 23UCY202

REG.NO. :

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

END-OF-SEMESTER EXAMINATIONS: MAY 2024

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

SEMESTER: II **TIME: 3 HOURS**

PART - III

CC II: ORGANIC AND PHYSICAL CHEMISTRY

SECTION – A **(10 X 1 = 10 MARKS)**

Answer the Following Questions **(K1)**

1. Identify the catalyst used in the dehydration of alcohols in ether preparation. _____

a) H_2SO_4 0b) $CuSO_4$ c) Na d) Ag_2O

2. Find the catalyst used in the Rosenmund reduction. _____

a) $AlCl_3$ b) MnO c) $SnCl_2$ d) Pd-$BaSO_4$

3. The numerical value of Planck's constant "h" is _____.

a) 6.026 X 10^{-34} JS b) 6.626 X 10^{-34} JS c) 6.626 X 10^{-32} JS d) 6.570 X 10^{-32} JS

4. Which among the following is not a state function?

a) temperature b) pressure c) work d) volume

5. The energy change that occurs in a chemical reaction is largely due to change of _____.

a) internal energy b)energy of the reactants c) energy of the products d) bond energy

Answer the Following in One (Or) Two Sentences **(K2)**

6. What is meant by keto-enol tautomerism?

7. What are primary standard substances?

8. Define Heisenberg's uncertainty principle.

9. What is meant by adiabatic process?

10. Write the Kelvin statement of second law of thermodynamics.

(COND..2)

SECTION – B (5 X 5 = 25 MARKS)

Answer Either (a) Or (b) in Each of the Following Questions. (K3)

11. a) Distinction between primary, secondary and tertiary alcohols.

(OR)

b) Describe the synthesis of following from acetoacetic ester. (i) adipic acid (ii) 4-methyl uracil

12. a) Describe the mechanism of aldol condensation.

(OR)

b) Give an account of strong acid vs strong base titration.

13. a) Explain the Einstein's theory of photoelectric effect.

(OR)

b) Give the significance of ψ and ψ^2 in quantum chemistry.

14. a) Write a note on law of conservation of energy.

(OR)

b) Explain zeroth law of thermodynamics with suitable example.

15. a) Give the limitations of first law of thermodynamics.

(OR)

b) Describe the entropy of mixing of ideal gases.

SECTION – C (5 X 8 = 40 MARKS)

Answer Either (a) or (b) in Each of the Following Questions. (K4 (Or) K5)

16. a) Explain the preparation and properties of oxalic acid.

(OR)

b) Discuss the synthesis of following compounds from malonic ester.

(i) barbutric acid (ii) succinic acid (ii) crotonic acid

17. a) Illustrate the following with mechanism. (ii) Perkin condensation (ii) MPV reduction

(OR)

b) Explain the following volumetric titrations with suitable example.

(i) complexometric titration (ii) redox titration

18. a) Explain the Bohr theory of hydrogen atom.

(OR)

b) Analyze the application of Schrodinger wave equation to particle in 1D box.

19. a) Explain the relationship between Cp and Cv.

(OR)

b) Discuss Joule-Thomson experiment with neat sketch.

20. a) Illustrate the measurement of enthalpy of reactions using bomb calorimeter with neat sketch.

(OR)

b) Discuss Gibbs Helmholtz equation.