I Semester Complimentary Chemistry Internal Examination February 2021

Marks:50 **General Chemistry** **Time: 2 hours**

Answer all the questions 1 mark each

1. The energies of two radiations with wavelengths 3000 A^0 and 1000 A^0 are in the ratio …..
2. The concept of wave – particle duality of matter was first proposed by ……
3. The wavelength of light with wave number 2×10^6 /m is ……
4. The designation for an orbital with n=5 and l=3 is ……
5. The dipole moment of CCl_4 is ……..
6. Agreement between two analytical values is called ……
7. The group reagent in the III group of qualitative analysis is
8. Give an advantage of microanalysis
9. In iodometric titrations, Iodine oxidizes sodium thiosulphate to ---
10. Give the indicator that can be used for the titrimetric estimation of acetic acid against sodium hydroxide is 1 X 10 =10

Answer any eight question 2 marks each

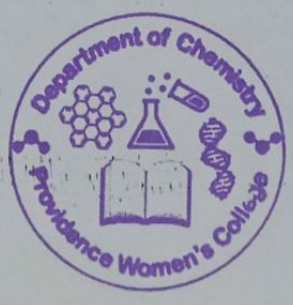
11. Calculate the wavelength of the radiation emitted when the electron in the Hydrogen atom excited to the fourth energy level returns to the third energy level.
12. Give any two limitations of Bohr's theory
13. Define: a) orbital, b) lattice energy
14. Give the Schrodinger wave equation and explain the terms involved
15. Calculate the approximate volume at STP of: (i) 8 gram O_2; and (ii) 6.02×10^{20} molecules of CO_2. (2)
16. Methyl orange is not a suitable indicator in the titration of a weak acid against a strong base. Why?
17. Distinguish between iodometry and iodimetry.
18. What are primary standards?
19. Why dil. sulphuric acid is added in the permanganometric titration of oxalic acid?
20. Why NH_4CI is added in the qualitative analysis of third group cations? 8 X 2 =16

Answer any three question 4 marks each

21. State Heisenberg's uncertainty principle. How does it contradict Bohr's atomic theory
22. Draw the MO energy level diagram of O_2. How does MOT explains the paramagnetism of O_2 molecule?
23. How can VSEPR theory be used to explain the shape and bond angle of water molecule?
24. Write down the principle of indicators used in acid base titration
25. Explain the action of N-phenyl anthranilic acid as a redox indicator. 4 X 3 = 12

Answer all the questions 6 marks each

26. Write briefly on common ion effect and solubility product. Explain the application of these in qualitative analysis.
27. Discuss the principle of complexometric titration taking suitable example 6 X 2 =12



IV Sem BSc Degree Internal Exam March 2021
CHE 4B04: Organic Chemistry I

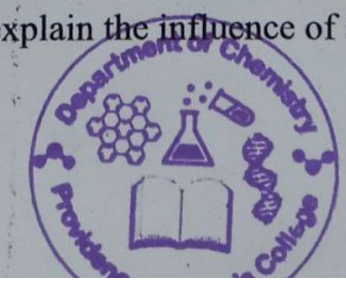
Time 2 hrs **Mark 50**

Section A

1. Suggest two methods to resolve racemic Lactic acid into optically active forms (5)
2. Write down the stereoisomers of tartaric acid. How many of them are optically active? Give reasons for your answer. (5)
3. Discuss the conformations of n-butane with proper energy profile diagram. (5)
4. Differentiate enantiomers and diastereomers with suitable example (4)
5. What do you understand by Chair and Boat conformations of cyclohexane? Why chair form is more stable than boat form? (4)
6. Taking suitable examples illustrate different rules followed to assign R and S notation to optical isomers (2)

Section B

7. Discuss with suitable examples, the structure, formation, stability and important reactions carbocations and free radical (10)
8. What are Carbenes? Give its hybridization and structure. Write two reactions in which they are formed (5)
9. Discuss inductive effect. Give examples for + I and -I groups. And also explain why 2-chlorobutanoic acid is more acidic than 3-chlorobutanoic acid. (5)
10. With the help of a suitable example, explain the influence of steric effect of reactivity (5)



IV the Semester complimentary Chemistry internal exam March 2021

Time 2hrs **Total 40 marks**

Section A (2marks for each question ,Maximum 12)

1. What are 0D nanomaterials
2. Define percentage atom economy of a synthesis
3. The number of vibrational modes given by CH_4 and NH_3
4. State Born Oppenheimer approximation
5. Calculate the energy of a radiation with wavenumber $1400cm^{-1}$
6. What is the main difference in principle between partition and adsorption chromatography?

Section B (4 marks for each question, Maximum 16)

7. Write a note on the different spectroscopic techniques
8. Sketch the vibrarional modes of CO2. Classify them as IR active and inactive and explain your answer
9. Explain the green synthesis of ibuprofen
10. (a) What is R_f value? How is it useful in the characterization of a compound? (b) Mention one demerit of LSC.

Section C (6 marks for each questions, Maximum 12 marks)

11. Write a note on the twelve principles of geen chemistry
12. Explain the terms a) Bathochromic shift b) Chromphore c) Beer Lambert's law d) Quantum size effect
13. (a) Explain how will you do characterization based on GLC peaks (b) Give an important limitation of GLC technique.