0039141

Reg. No. ☐☐☐☐☐☐☐

II Semester B.Sc. Degree Examination, September – 2021
CHEMISTRY
(CBCS Scheme Repeaters Prior to 2020-21)
Paper:II

Time : 3 Hours   **Maximum Marks : 70**

Instructions to Candidates:

1. The question paper has two parts. Answer both the Parts.
2. Write equation, draw diagrams wherever necessary.

PART - A

Answer any **EIGHT** of the following questions. Each question carries **TWO** Marks.
(8×2=16)

1. Define the term Orbit and Orbital of an atom.
2. Write Schrondinger Wave equation and indicate the terms involved.
3. Write the electronic configuration of oxygen molecule. Predict its magnetic Property.
4. How Lattice energy affects the solubility of an ionic crystal.
5. Write Born-Lande equation and indicate the terms involved.
6. Write the Shapes of the Orbital when l=0 and l=1.
7. What are Interstitial Compounds? Give an example.
8. Give an example of Diel's Alder reaction.
9. What is Ulmann reaction? Give an example.
10. How is Stilbene Prepared? Give equation.
11. Explain Saytzeff rule with an example.
12. Mention any two applications of Neon.

PART - B

Answer any **NINE** of the following questions. Each question carries **SIX** Marks. **(9×6=54)**

13. a) Explain Eigen Values and Eigen functions in Quantum mechanics.

   b) Calculate the energy associated with Bohr's 3rd orbit, given the energy of Bohr's first orbit is 2.17×10^{-18} J.
   (4+2)

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14. a) Derive an expression for the energy of the first Bohr Orbit in hydrogen atom

   (Expression for $r = \dfrac{4\pi\varepsilon_o h^2}{mc^2}$)

   b) State Heisenberg's Uncertainty Principle. (4+2)

15. a) Explain the terms

   i) Hamiltonian Operator.

   ii) Laplacean Operator.

   b) State DeBroglie's Wave Theory. (4+2)

16. a) Explain SP^3 hybridisation with $SiCl_4$ as an example.

   b) Calculate bond order of He^{2+} ion. (4+2)

17. a) Explain the Shape of Water molecule on the basis of VSEPR Theory.

   b) Mention the type of hybridisation of the Central Atom in the following

   i) $BeCl_2$ ii) PCl_5 (4+2)

18. a) Set up Born-Haber cycle for the formation of Nacl. Write the formula for Calculation of lattice energy using the cycle.

   b) How the electrical property semi conductors is explained based on Bond theory. (4+2)

19. a) How does Xeo_3 reacts with

   i) Water   ii) Base. Give Equations.

   b) What is intermolecular hydrogen bonding? Give an example. (4+2)

20. a) What are Zeolites? Give the structure and mention two applications.

   b) cu^{2+} ion is coloured but zn^{2+} ion is colourless. Give reason. (4+2)

11222

21. a) Give reasons for the following properties of transition metals.
    i) Form Coloured Compounds
    ii) Exhibits Variable Oxidation State.
    b) What are Actinides? Give Examples.   **(4+2)**

22. a) Describe ion exchange method for the separation of Lanthanides.
    b) Calculate the magnetic moment of Cr^{3+} ion   **(4+2)**

23. a) Explain the Orienting influence of nitro group in nitrobenzene towards electrophilic substitution reaction.
    b) How Napthalene is converted into Phthalic acid? Give equation.   **(4+2)**

24. a) State and Explain Huckel's rule of Aromaticity with Cyclopentadienyl anion as an example.
    b) Explain Etard's reaction with an example.   **(4+2)**

25. a) Explain SN' mechanism with an example.
    b) What is elimination reaction? Give an example.   **(4+2)**

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