

24U125

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Name : .....

Reg. No : .....

**FIRST SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2024**

(FYUGP)

**CC24U CHE1 MN102 - BASIC INORGANIC AND BIOINORGANIC CHEMISTRY**

(B.Sc. Chemistry - Minor Course)

(2024 Admission - Regular)

Time: 2.0 Hours

Maximum: 70 Marks

Credit: 4

**Part A** (Short answer questions)

Answer *all* questions. Each question carries 3 marks.

1. Explain two application of Born Haber cycle. [Level:2] [CO1]
2. Predict the shape of  $\text{BeF}_2$  molecule on the basis of VSEPR theory. [Level:2] [CO2]
3. Discuss Hund's Rule of Maximum Multiplicity? Describe how it influences the filling of orbitals within a subshell. [Level:2] [CO1]
4. Explain how the Bohr model differs from the Rutherford model of the atom. [Level:2] [CO1]
5. State and explain Mendeleev's periodic law. [Level:2] [CO3]
6. Summarize the relationship between sample size and the accuracy of microanalysis. [Level:2] [CO4]
7. Explain how to express the concentration of a solution in terms of mole fraction and its relation to vapor pressure. [Level:2] [CO4]
8. Discuss the difference between a strong acid and a weak acid in the context of acid-base titration? [Level:2] [CO4]
9. Discuss the transport phenomena of oxygen and carbondioxide in humanbeings. [Level:2] [CO5]
10. Describe the functions of sodium and potassium in the biological system. [Level:2] [CO5]

**(Ceiling: 24 Marks)**

**Part B** (Paragraph questions/Problem)

Answer *all* questions. Each question carries 6 marks.

11. Explain the Linear Combination of Atomic Orbitals (LCAO) method in MO theory. [Level:2] [CO2]
12. Discuss the differences between sigma and pi bonds. [Level:2] [CO2]
13. Explain the term inert pair effect with suitable examples. [Level:2] [CO3]
14. Explain the principles involved in separating cations during qualitative analysis. [Level:2] [CO4]

15. Explain the difference between atomic mass and equivalent mass, including their [Level:2] [CO4] applications in chemistry.
16. Explain the mechanism of action of cisplatin as an anticancer drug. Explain its limitations. [Level:2] [CO5]
17. Discuss the role of Metal ions in biological systems. [Level:2] [CO5]
18. Discuss the functions of following metalloenzymes (i) Carbonic anhydrase (ii) Carboxy [Level:2] [CO5] peptidase (iii) Alcohol dehydrogenase.

**(Ceiling: 36 Marks)**

**Part C (Essay questions)**

Answer any *one* question. The question carries 10 marks.

19. (a) Explain the Schrodinger wave equation. [Level:2] [CO1]  
(b) Discuss the major difference between orbit and orbital.  
(c) Explain the nature and significance of  $\Psi$  and  $\Psi^2$ .
20. (i) Explain complexometric titrations taking EDTA as the chelating agent. [Level:2] [CO4]  
(ii) Discuss metal ion indicators and explain the action of metal ion indicators with a suitable example.

**(1 × 10 = 10 Marks)**

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