24U120 (Pages: 2) Name : .....

Reg. No : .....

FIRST SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2024

(FYUGP)

CC24U CHE1 MN104 - BASIC INORGANIC CHEMISTRY AND METALLURGY

(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. Calculate the uncertainty in the momentum of a particle whose uncertainty in position is of the order of $1A^{o}$. [Level:3] [CO1]
2. Write the electronic configuration of copper and chromium. [Level:1] [CO1]
3. Find out n, l and m values for an electron in the 3pz orbital. [Level:1] [CO1]
4. What is hydrogen bond? Explain with an example. [Level:1] [CO2]
5. Explain why is a cation smaller than the neutral atom from which it is formed. [Level:2] [CO3]
6. Explain the condition for the precipitation of a substance (salt) from the solution. [Level:2] [CO4]
7. Discuss the meaning of the term most probable value related to an analytical result. [Level:2] [CO4]
8. Explain the term molarity of a solution. [Level:2] [CO4]
9. Discuss the open hearth process used in steel production. [Level:2] [CO5]
10. Explain the function of cryolite in the extraction of aluminum? [Level:2] [CO5]

(Ceiling: 24 Marks)

Part B (Paragraph questions/Problem)

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

11. What is hybridization? Explain the salient features of hybridization. [Level:1] [CO2]
12. Explain sp^2 hybridization, taking BF_3 molecules as an example. [Level:2] [CO2]
13. Draw diagrammatic representation of the s-orbital and the five d-orbitals [Level:3] [CO1]
14. Explain the significance of Moseley's X-ray studies in the development of the periodic table. [Level:2] [CO3]

15. Discuss the process of oxidation and reduction with examples. [Level:2] [CO4]

16. Discuss the theory behind volumetric analysis. [Level:2] [CO4]

17. Discuss calcination and roasting in the concentration of ores. How do these processes help in metal extraction? [Level:2] [CO5]

18. Discuss zone refining and explain how it is used in the purification of metals with example. [Level:2] [CO5]

(Ceiling: 36 Marks)

Part C (Essay questions)

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

19. Explain quantum numbers. Discuss the significance of each quantum numbers. [Level:2] [CO2]

20. What are acid-base indicators ? Explain the principles regarding the choice of suitable indicators in different acid-base titrations. [Level:2] [CO4]

(1 × 10 = 10 Marks)

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