QP Code: U25DR007

Reg. No : .....
Name : .....

ST MARY'S COLLEGE (AUTONOMOUS), THRISSUR-20

I SEMESTER (FYUGP) DEGREE REGULAR EXAMINATIONS, NOVEMBER 2025
CHE1MN104 : Basic Inorganic Chemistry and Metallurgy
2025 Admission Onwards
(Credits: 4)

Time: 2 Hours **Maximum Marks: 70**

Section A

*Answer **all**. Each question carries **3** Marks.* ***(Ceiling: 24 Marks)***

1. Define Heisenberg's Uncertainty Principle with equation.
2. Evaluate the significance of intermolecular hydrogen bonding in determining the physical properties of water.
3. Compare the variation of atomic radius along a period and down a group.
4. Li resembles Mg in its behavior. Name the relationship. Justify.
5. What is double burette method of titration?
6. What volume will 3 moles of oxygen gas occupy at STP?
7. Mention any two advantages of microanalysis.
8. Define the term mole fraction.
9. Give the composition and uses of German silver and brass.
10. What is meant by concentration of an ore?

Section B

*Answer **all**. Each question carries **6** Marks.* ***(Ceiling: 36 Marks)***

11. Compare the bond order and magnetic behavior of N_2 and O_2 using molecular orbital theory.
12. Analyze how the four quantum numbers together determine the unique position of an electron in an atom.
13. State the important assumptions made in VSEPR theory.
14. Prepare short note on electronegativity, factors affecting and its variation along a period.
15. With help of solubility product and common ion effect explain the intergroup separation of cations.

Turn Over

16. What are acid-base indicators? Discuss the two theories of acid base indicators?

17. Calculate the total no. of ions present in 111g of anhydrous $CaCl_2$ (Ca=40, Cl=35.5)

18. Discuss the principle and method of electrolytic refining of any metal.

Section C

*Answer **any one**. Each question carries **10** Marks.* ***(1x10=10marks)***

19. a) Critically evaluate the concept of hybridisation and explain its salient features
    b) Examining the significance of hybridisation in explaining the bonding and geometry of ethylene and acetylene.

20. Describe the extraction of Aluminium from its ore.

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