Date: 03-04-2019   Dept. No.   Max. : 100 Marks

Time: 01:00-04:00

PART- A

Answer ALL questions   10X2 = 20

1. 'K$^+$ and Cl$^-$ are isoelectronic yet ionic radii differ.' Why?

2. Define Heisenberg uncertainty principle.

3. Calculate the oxidation number of Mn in $KMnO_4$.

4. What are protic and aprotic solvents? Give examples.

5. State octet rule. Give an example.

6. How are   and   bonds formed?

7. State Meissner effect.

8. 'Helium molecule is not formed'. Why?

9. What are pseudohalogens ? Give an example.

10. Mention the anomalous behaviour of fluorine.

PART- B

Answer any EIGHT questions   8x5 = 40 marks

11. Explain Pauling and Mulliken – Jaffe scale of electronegativity.

12. Write notes on (i) Inert pair effect   (ii) Modern periodic law

        (iii) Pauli's exclusion principle

13. State and explain Arrhenius and Lowry – Bronstedconcept of acids and bases.

14. Explain the following reactions in liquid ammonia.

    (i) Precipitation   (ii) Complex formation

15. Write notes on HSAB concept of acid and base.

16. Describe the structure of following molecules on the basis of VSEPR theory.

    (i) XeF_6 (ii) ClF_3

17. State and explain Pauling slater rule.

18. Sketch the molecular orbital diagram of CO and state its bond order and magnetic property.

19. Write notes on band theory of metals.

20. Discuss the structure of IF_7 using VSEPR theory.

21. Write the preparation, properties and structure of dioxygendifluoride.

22. What is sidgwick- Powell theory. Mention its drawback.

1

PART- C

Answer any FOUR questions   **4x10 = 40 marks**

23. Explain periodicity properties of elements based on ionisation energy, ionic radii,

    electronegativity andelectron affinity

24. Give a brief account on the types of chemical reactions with examples.

25. Discuss the geometry of OF_2 and SF_6 using hybridization.

26. (i) Explain piezoelectric and pyroelectric crystals with examples.   **4 marks**

    (ii) Draw the MO diagram of oxygen molecule and calculate its bond order.   **6 marks**

27. (i) Discuss the estimation of available chlorine.   **4 marks**

    (ii) Write notes on ionic, covalent and bridging halides.   **6 marks**

28. (i) Balance the following chemical reactions by oxidation number and ion electron method

                                                                                 6 marks

    $KMnO_4 + Na_2SO_3$ -----------$\rightarrow$ $MnO_2+ Na_2SO_4 + KOH$
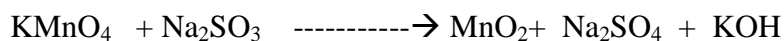
    (ii) Discuss the shape of ICl_4^-using VSEPR theory   **4 marks**

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