(6 pages) Reg. No. : _____

Code No. : 20461 E Sub. Code : CMCH 11

B.Sc. (CBCS) DEGREE EXAMINATION
NOVEMBER 2023.

First Semester

Chemistry – Core

INORGANIC CHEMISTRY — I

(For those who joined in July 2021–2022)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. Electrons are filled in the various orbital in the order of increasing energy is called
   (a) Hund's rule
   (b) Pauli's exclusion principle
   (c) Aufbau's principle
   (d) None of the above

2. The orbital which has spherical shape is
   (a) s orbital (b) d orbital
   (c) f orbital (d) p orbital

3. Along the group, where we move down the group ionisation potential
   (a) decreases (b) increases
   (c) no change (d) none of the abvoe

4. Energy released when an electron is added to isolated gaseous atom in its ground state is called
   (a) ionisation energy
   (b) electron affinity
   (c) electro negativity
   (d) none of the above

5. As per VSEPR theory $BeCl_2$ has ———— geometry.
   (a) Linear
   (b) Tetra hedral
   (c) Square planar
   (d) Planar triangle

6. N_2 molecule is ———— in nature.
   (a) para magnetic
   (b) dia magnetic
   (c) ferro magnetic
   (d) all the above

7. Lanthanides and actinides are called ————
   (a) f block elements
   (b) d block elements
   (c) p block elements
   (d) s block elements

8. The general electronic configuration ns^2np^5 belongs to ———— group.
   (a) I A group (b) II A group
   (c) III A group (d) VII A group

9. The product of concentration of ions present in a satarated solution is called
   (a) ionic product
   (b) solubility product
   (c) common ion effect
   (d) none of the above

10. The indicator used in redox titration is
    (a) phenolphthalein
    (b) methyl orange
    (c) starch
    (d) ferroin

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Write a note on de-Broglie theory.

Or

(b) State and explain Pauli's exclusion principle.

12. (a) What is ionisation energy? Explain how it is varied in groups and periods of the periodic table.

Or

(b) Write a note on Vandes Waal's radii.

13. (a) Explain VSEPR theory.

Or

(b) Draw and explain the molecular orbital diagram of NO.

14. (a) Explain the diagonal relationship between Li and Mg.

Or

(b) Explain the structure of silicates.

15. (a) Explain the principle of intergroup separation of cation.

Or

(b) Write a note on acid-base titration.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write a note on quantum numbers and their significance.

Or

(b) (i) Write Schrodinger's equation and its significance.

(ii) Give the difference between ψ and ψ^2.

17. (a) Determine electronegativity by

(i) Pauling's method

(ii) Mullikan's method.

Or

(b) Explain the factors effecting ionisation energy.

18. (a) Explain Fajan's rule and its application.

Or

(b) Explain the theory of linear combination of atomic orbitals (LCAO method)

19. (a) Explain the complexes formed by alkali and alkaline earth metals with poly dentate ligands.

Or

(b) Explain the allotrops of carbon and sulphur.

20. (a) Write a note on the following :

(i) Flame test

(ii) Elimination of acid radicals.

Or

(b) (i) Write a note on complexometric titration.

(ii) How to minimise error in gravimetric analysis?
