

(6 pages)

Reg. No. :

Code No. : 10001 E Sub. Code : SMCH 11

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2023

First Semester

Chemistry — Core

INORGANIC CHEMISTRY — I

(For those who joined in July 2017–2019)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The one which is used to describe the position and energy of the electron in an atom
 - (a) quantum number
 - (b) wave function
 - (c) probability distribution
 - (d) debroglie equation

2. The principle which states that the electrons fill lower - energy atomic orbitals before filling higher - energy ones is
 - (a) Hund's rule
 - (b) Aufau principle
 - (c) Pauli's principle
 - (d) Wave function
3. The unit of electron affinity is
 - (a) mol⁻¹
 - (b) kJ/mol
 - (c) kJ/mol⁻¹
 - (d) kJ⁻¹mol
4. The general outer electronic configuration of S block element is
 - (a) ns⁽¹⁻¹⁾
 - (b) ns⁽¹⁻⁰⁾
 - (c) ns⁽²⁻¹⁾
 - (d) ns⁽¹⁻²⁾
5. Which theory fails to explain the tetravalency of carbon
 - (a) Molecular Orbital theory
 - (b) Valance Bond theory
 - (c) Lattice energy
 - (d) Fajan's rule



6. Which one of the following is a factor which affects lattice energy
- (a) The magnitude of charge associated with the constituent ions
- (b) The distance between the ions
- (c) (a) and (b)
- (d) None of the above
7. Which is more appropriate to BeH_2
- (a) electron deficient covalent compound
- (b) electron rich covalent compound
- (c) covalent compound
- (d) electron deficient ionic compound
8. The melting point and boiling point of lithium are _____ that than other alkali metals.
- (a) higher (b) lower
- (c) no change (d) none of the above
9. Borazine is _____ reactive as compared to benzene.
- (a) more (b) less
- (c) equal (d) not applicable

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10. $-\text{R}_2\text{Si}-\text{O}-\text{SiR}_2-$ is related to
- (a) silicones (b) silicates
- (c) borohydrides (d) oxyacids

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Discuss on schrodinger wave equation.

Or

- (b) Define
- (i) Hund's rule (2.5)
- (ii) Aufbau principle. (2.5)

12. (a) Describe on the classification of s,p,d and f block element.

Or

- (b) Explain. Allred Rochow's scale of electronegativity.

13. (a) List out the factors affecting lattice energy.

Or

- (b) Discuss on the applications of MOT to O_2 and F_2 .

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14. (a) Discuss on the diagonal relationship between Li and Be.

Or

- (b) Compare the solvation tendencies of alkali and alkaline earth metals with examples.

15. (a) List out the general characteristics of p-block elements.

Or

- (b) Write the preparation and properties of borazine.

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 the quantum numbers and their significance.

Or

- (b) (i) Discuss on the radial probability distribution.
(ii) Write a short note on Pauli's exclusion principle.

17. (a) Define the following :

- (i) ionic radii
(ii) atomic radii
(iii) electron affinity
(iv) ionisation energy.

Or

- (b) (i) List out the factors affecting the electronegativity. (4)
(ii) Write the applications of electronegativity. (4)

18. (a) Explain

- (i) Born Haber cycle. (5)
(ii) Discuss on enthalpy of formation. (3)

Or

- (b) Explain

- (i) Fajan's rule. (4)
(ii) Write a note on sp and sp^2 hybridisation with examples. (4)

19. (a) (i) List out the general characteristics of s-block elements. (4)
(ii) Discuss on the complexation tendencies of alkali metals with examples. (4)

Or



- (b) (i) Write a note on the classification. (3)
(ii) and Salient features of hydrides. (5)
20. (a) Describe on the preparation and properties of oxyacids.

Or

- (b) Discuss on the preparation, properties and structure of diborane.
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