

(6 pages)

Reg. No. : .....

Code No. : 20615 E Sub. Code : EMCH 11/  
FCCH 11

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2025.

First Semester

Chemistry — Core

GENERAL CHEMISTRY – I

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Which indicates the number of protons present in the nucleus of an atom
- (a) Atomic mass
  - (b) Atomic weight
  - (c) Atomic number
  - (d) Mass defect

2. The Aufbau principle states that
- (a) electrons fill higher energy orbitals first
  - (b) electrons fill middle energy orbitals first
  - (c) electrons fill lower energy orbitals first
  - (d) electrons fill only higher energy orbitals
3. This is a tendency of an atom to attract electrons
- (a) electron affinity
  - (b) electronegativity
  - (c) atomic radii
  - (d) ionization energy
4. This is the total distance from the nucleus of an atom to the outermost of its electron
- (a) Ionic radii
  - (b) Atomic radii
  - (c) Atomic size
  - (d) Covalent radii
5. The melting point of KCl is \_\_\_\_\_ than AgCl.
- (a) Lower
  - (b) Higher
  - (c) Similar
  - (d) None of the above
6. The geometry of  $AB_2$  molecules is
- (a) Trigonal
  - (b) Linear
  - (c) Bipyramidal
  - (d) Tetrahedral

7. Which theory describes the behavior of electrons in a molecule in terms of combination of the atomic wave functions
- Valence bond theory
  - Molecular orbital theory
  - Band theory
  - None of the above
8. The constructive overlapping of atomic orbitals is known as
- bonding orbitals
  - antibonding orbitals
  - dipole interactions
  - induced dipole interactions
9. This is a measure of extra stability of the conjugated system compared to the corresponding number of isolated double bond
- inductive effect
  - inductomeric
  - electrometric
  - resonance energy

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10. The correct order of acidity of the following is
- para nitrophenol > meta nitrophenol > phenol
  - phenol > meta nitrophenol > para nitrophenol
  - para nitrophenol > phenol > meta nitrophenol
  - phenol > para nitrophenol > meta nitrophenol

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Explain : De-broglie wave length.
- Or
- (b) Explain: Pauli's exclusion principle.
12. (a) How the probability density is useful in quantum mechanics?
- Or
- (b) How the bohr orbit is differing from an orbital.
13. (a) Write a note on Madulung constant.
- Or
- (b) Explain: Shapes of orbitals.

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14. (a) How will you elaborate the electron sea model?

Or

(b) Explain: Dipole-Dipole interactions.

15. (a) Describe on electrometric effects.

Or

(b) Explain: Steric inhibition to resonance.

PART C — (5 × 8 = 40 marks)

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

Each answer should not exceed 600 words.

16. (a) (i) Explain: The Franck-Hertz experiment. (6)

(ii) Define: Hund's rule. (2)

Or

(b) (i) Discuss on Davission and German experiment. (6)

(ii) Define: Atomic number. (2)

17. (a) (i) Demonstrate on Schrodinger wave equation. (6)

(ii) Define: Atomic radii. (2)

Or

(b) Explain: Electronegativity scales.

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18. (a) Explain: VSEPR theory.

Or

(b) (i) Define: Lattice energy. (2)

(ii) Explain: Born Haber cycle. (6)

19. (a) (i) Explain: Induced dipole interactions. (5)

(ii) Write a short note on Vander Waals forces. (3)

Or

(b) (i) List out the applications of semiconductors. (4)

(ii) Define:

(1) Conductors (2)

(2) Insulators (2)

20. (a) (i) Explain: Reactivity of alkyl halides. (4)

(ii) Explain: Stability of carbonium ions. (4)

Or

(b) (i) Define Basicity of Aromatic amine. (4)

(ii) Explain: Nucleophile and Electrophile. (4)

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