



1.1 Which principle states that electrons fill orbitals with lower energy before moving on to higher energy orbitals?

a) Aufbau b) Pauli c) Einstein d) Hund

Ans. a

1.2 Electronic configuration of the outer shell of the element Gd with atomic number 64 is:

(a) [Xe] 4f¹ 5d¹ 6s² (b) [Xe] 4f¹ 6s³ (c) [Xe] 4f⁴ (d) [Xe] 4f² 6s²

Ans.

1.3 Maximum number of electrons in a shell can be:

(a) $4l + 2$ (b) $4l - 2$ (c) $2n^2$ (d) $2l + 1$

Ans. c

1.4 The quantum number that determines the orbital angular momentum-

(a) Spin quantum number (b) magnetic quantum number (c) azimuthal quantum number
(d) Principal quantum number

Ans. b

1.5 Number of unpaired electrons in Ni²⁺:

(a) 3 (b) 1 (c) 2 (d) 0

Ans. c

1.6 If the electronic structure of any transition element is governed mainly by:

(a) Hund's rule (b) Pauli's exclusion principle (c) Aufbau Principle (d) None of these

Ans. c

1.7 Which quantum number(s) do 2p_x and 2p_y orbitals have in common?

(a) n and l (b) n (c) l and m_l (d) l

Ans. a

1.8 For a principal quantum number n, how many atomic orbitals are possible?

a) n² b) n + 1 c) 2n d) n

Ans. a

1.9 Which among the following requires determination of Spin multiplicity-

a) Aufbau b) Pauli c) Einstein d) Hund

Ans. d

1.10 Element Z has the ground state electronic configuration $1s^2 2s^2 2p^5$. In which group does it belong?

(a) 5 (b) 15 (c) 17 (d) 13

Ans. c

1.11 A set of orbitals for which the quantum number $l = 1$ is:

(a) 7-fold degenerate b) non-degenerate c) 3-fold degenerated d) 5-fold degenerate

Ans. c

1.12 For the principal quantum number $n = 5$, it is possible to have:

(a) only s and p orbitals b) only s, p, d and f orbitals c) only an s orbital d) only s, p and d orbitals

Ans. b

1.13 The electronic configuration of Ag is:

(a) $[Kr] 4d^{10} 5s^1$ b) $[Kr] 4d^8 5s^2$ c) $[Kr] 4d^9 5s^2$ d) None of these

Ans. a

1.14 The electronic configuration of Nb is:

a) $[Kr] 4d^4 5s^1$ b) $[Kr] 4d^5$ c) $[Kr] 4d^3 5s^2$ d) $[Kr] 4d^5 6s^1$

Ans. a

1.15 Find the number of unpaired electrons present in Cr^{3+} :

(a) 6 b) 4 c) 5 d) 3

Ans. d

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