ATOMIC STRUCTURE MCQs

1. Rutherford's experiment which established the nuclear model of the atom used a beam of
(a) β-particles which impinged on a metal foil and got absorbed
(b) γ-rays, which impinged on a metal foil and got absorbed
(c) helium atoms which impinged on a metal foil and got reflected
(d) helium nuclei which impinged on a metal foil and got scattered.

2. How many moles of electrons weigh one kilogram?
(a) 6.022×10^{23}
(b) $1/9.108 \times 10^{31}$
(c) $6022/9.108 \times 10^{54}$
(d) $1/(9.108 \times 6.022) \times 10^{8}$

3. The wavelength associated with a golf ball weighing 60 gm and moving at a speed of 36 km/hr
(a) 10^{-33} m
(b) 10^{-31} m
(c) 10^{-16} m
(d) 10^{-25} m

4. The number of nodal planes in px orbital is
(a) one
(b) two
(c) three.
(d) zero

5. The electronic configuration of an element is $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^5\ 4s^1$. It represents
(a) excited state
(b) cationic states
(c) ground state
(d) anionic state

6. Azimuthal quantum number determines the
(a) size
(b) spin
(c) orientation
(d) angular momentum of orbitals

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7. The electronic configuration of Cu^{2+} ion is
(a) $[Ar]\ 4s^1\ 3d^8$
(b) $[Ar]\ 4s^2\ 3d^{10}\ 4p^1$

(c) $[Ar]\ 4s^1\ 3d^{10}$
(d) $[Ar]\ 3d^9$

8. The total number of orbitals in a shell having principal quantum n is
(a) $2n$
(b) n^2
(c) $2n^2$
(d) $(n + 1)$

9. The ion iso-electronic with CO is
(a) O_2^-
(b) N_2^+
(c) CN^-
(d) O^+2

10. The line spectrum of hydrogen obtained in the visible region of light corresponds to
(a) Lyman series
(b) Balmer series
(c) Paschen series
(d) Brackett series

11. The electronic configuration of N is $1s^2\ 2s^2\ 2p^3$. This filling fulfills
(a) Heisenberg's Uncertainty Principle
(b) Hund's rule of maximum multiplicity
(c) Pauli Exclusion Principle
(d) Bohr postulate of stationary orbits

13. The energy of electron in the first Bohr orbit of H atom is 13.6 eV. The possible energy value (s) of the excited state(s) for electron in Bohr orbitals of hydrogen is (are)
(a) – 3.4 eV
(b) -4.2eV

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(c) – 6.8 eV

(d) + 6.8 Ev14.The last entering electron in an element has quantum number n = 3, l = 2, m = + 2 and s = - 1 /2. The atomic number of the element will be

(a) 13

(b) 21

(c) 29

(d) 39

15.Bohr atomic model can explain

(a) the spectrum of hydrogen atom only

(b) spectrum of an atom or ion containing one electron only

(c) the spectrum of hydrogen molecule

(d) the solar spectrum

16.Magnetic quantum number specifies

(a) orbital size

(b) orbital shape

(c) orbital orientation

(d) nuclear stability

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17.Which of the following set of quantum numbers belong to highest energy?

(a) n = 4, l = 0, m = 0, s = + 12

(b) n = 3, l = 0, m = 0, s = + 12

(c) n = 2, l = 1, m = 1, s = + 12

(d) n = 3, l = 2, m = 1, s = + 12

18.Ground state electronic configuration of nitrogen is represented as

19.The orbital diagram in which Aufbau principle is violated is

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Match type Questions

Column I	Column II
1. Discovery of neutrons was done by.	1. R.A. Millikan
2. Degenrate orbitals are first singly occupied.	2. Balmer Series
3. Orbitals are filled in order of increasing energy.	3. Max Planck
4. An orbital can have maximum two electrons.	4. Chadwick
5. Position and momentum of a small particle cannot be measured simultaneously with absolute accuracy.	5. Hund's rule
6. The angular momentum of a moving electron in an orbit is quantised.	6. Thomson
7. An atom is like a watermelon of positive charge in which electrons are embedded like the seeds.	7. Aufbau principle
8. The energy of each photon is directly proportional to the frequency.	8. Pauli Exclusion principle
9. When an electron jumps from 4th orbit to 2nd orbit, it gives rise to	9. Heisenburg's uncertainty principle
10. The charge on an electron was found by oil drop exp. = 1.60 × 10^{-19} coulombs	10. Bohr's model of atom

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