1. The following quantum no. are possible for how many orbitals n = 3, ℓ = 2, m = +2
(1) 1 (2) 2
(3) 3 (4) 4

2. The energy of second Bohr orbit of the hydrogen atom is –328 KJ/mol. Hence the energy of fourth Bohr orbit should be :
(1) –41 KJ/mol (2) –1312 KJ/mol
(3) –164 KJ/mol (4) –82 KJ/mol

3. The measurement of the electron position is associated with an uncertainty in momentum, which is equal to 1×10^{-18} g cm s^{-1} . the uncertainty in electron velocity is : (mass of electron = 9×10^{-28}g)
(1) 1×10^{11} cm s^{-1}
(2) 1×10^{9} cm s^{-1}
(3) 1×10^{6} cm s^{-1}
(4) 1×10^{5} cm s^{-1}

4. Maximum number of electrons in a subshell of an atom is determined by the following :-
(1) $2n^2$ (2) $4\ell + 2$
(3) $2\ell + 1$ (4) $4\ell - 2$

5. A 0.66 kg ball is moving with a speed of 100 m/s. The associated wavelength will be
(h = 6.6×10^{-34} Js) :-
(1) 6.6×10^{-34} m (2) 1.0×10^{-35} m
(3) 1.0×10^{-32} m (4) 6.6×10^{-32} m

6. The energies E_1 and E_2 of two radiations are 25 eV and 50eV respectively. The relation between their wavelengths i.e. λ_1 and λ_2 will be :
(1) $\lambda_1 = \lambda_2$ (2) $\lambda_1 = 2\lambda_2$
(3) $\lambda_1 = 4\lambda_2$ (4) $\lambda_1 = \frac{1}{2}\lambda_2$

7. Smallest wavelength occurs for
(1) Lyman series
(2) Balmar series
(3) Paschen series
(4) Brackett series

8. Maximum number of electrons in a subshell with ℓ = 3 and n = 4 is:
(1) 10 (2) 12
(3) 14 (4) 16

9. The value of Planck's constant is 6.63×10^{-34} Js. The speed of light is 3×10^{17} nm s^{-1}. Which value is closest to the wavelength in nanometer of a quantum of light with frequency of 6×10^{15} s^{-1} ?
(1) 75 (2) 10
(3) 25 (4) 50

10. The energy of an electron of $2p_y$ orbital is
(1) greater than $2p_x$ orbital
(2) Less than $2p_z$ orbial
(3) same as that of $2p_x$ and $2p_z$ orbital
(4) Equal to 2s orbital

11. A and B are two elements which have same atomic weight and are having atomic number 27 and 30 respectively. If the atomic weight of A is 57 then number of neutron in B is :-
(1) 27 (2) 33 (3) 30 (4) 40

12. Energy required to remove an e^- from M shell of H-atom is 1.51 eV, then energy of I^{st} excited state will be :-
(1) –1.51 eV (2) +1.51 eV
(3) –3.4 eV (4) –13.6 eV

13. Number of possible orbitals (all types) in n = 3 energy level is :-
(1) 1 (2) 3
(3) 4 (4) 9

14. When 3d orbital is complete, the new electron enters into :-
(1) 4p orbital
(2) 4f orbital
(3) 4s orbital
(4) 4d orbital

15. Which orbital diagram does not obey Aufbau principle :-
(1) ↓↑ | ↑↓ | 1 | 1 (2) ↓ | ↑↓ | 1 | 1
(3) ↑↓ | ↑↓ | ↑↓ | 1 (4) ↑↓ | 1 | 1 | 1

16. Species which are isoelectronic to one another are
(a) CN^- (b) OH^-
(c) CH_3^+ (d) N_2
(e) CO
Correct Ans :-
(1) a, b, c (2) a, c, d
(3) a, d, e (4) b, c, d

17. $\frac{h}{2\pi}$ is angular momentum in.....orbit of He^+
(1) First (2) Second
(3) Third (4) Infinite

18. I[st] shell energy of He^+ is –54.4 eV. Then energy of its 2[nd] shell is :-

(1) –54.4 eV (2) –13.6 eV
(3) –27.2 eV (4) +27.2 eV

19. Third line of Balmer series is produced by which transition in spectrum of H–atom
(1) 5 to 2
(2) 5 to 1
(3) 4 to 2
(4) 4 to 1

20. The ratio of radii of 3rd and 2nd Bohr's orbits of hydrogen atom is :–

(1) 3 : 2 (2) 4 : 9
(3) 9 : 4 (4) 9 : 1

21. A metal in its dipositive state has the electronic configuration 2, 8, 14 and has the atomic weight equal to 56. Number of neutrons in its nucleus would be

(1) 30 (2) 32 (3) 34 (4) 28

22. In Balmer series of hydrogen atom spectrum which electronic transition causes third line :-
(1) Fifth Bohr orbit to second
(2) Fifth Bohr orbit to first
(3) Fourth Bohr orbit to second
(4) Fourth Bohr orbit to first

23. The ratio between kinetic energy and the total energy of the electrons of hydrogen atom according to Bohr's model is :-

(1) 2 : 1 (2) 1 : 1
(3) 1 : –1 (4) 1 : 2

24. Correct statement is :-

(1) K = $4s^1$, Cr = $3d^4\ 4s^2$,Cu = $3d^{10}\ 4s^2$
(2) K = $4s^2$, Cr = $3d^4\ 4s^2$, Cu = $3d^{10}\ 4s^2$
(3) K = $4s^2$, Cr = $3d^5\ 4s^1$,Cu = $3d^{10}\ 4s^2$
(4) K = $4s^1$, Cr = $3d^5\ 4s^1$,Cu = $3d^{10}\ 4s^1$

25. Which of the following pairs is correctly matched

(1) Isotopes $^{40}_{20}Ca$, $^{40}_{19}K$

(2) Isotones $^{30}_{14}Si$,$^{31}_{15}P$,$^{32}_{16}S$

(3) Isobars $^{16}_{8}O$, $^{17}_{8}O$, $^{18}_{8}O$

(4) Isoelectronic N^{-3}, O^{-2}, Cr^{+3}

26. The relative abundance of two rubidium isotopes of atomic weights 85 and 87 are 75% and 25% respectively. The average atomic wt. of rubidium is:–

(1) 75.5 (2) 85.5
(3) 86.5 (4) 87.5

27. The ratio of specific charge of a proton and an α–particle is :–

(1) 2 : 1 (2) 1 : 2
(3) 1 : 4 (4) 1 : 1

28. In an atom $_{13}Al^{27}$. number of protons is (a) electron is (b) and neutron is (c). Hence ratio will be [in order c : b : a]

(1) 13 : 14 : 13 (2) 13 : 13 : 14
(3) 14 : 13 : 13 (4) 14 : 13 : 14

29. An isotone of $_{32}Ge^{76}$ is :-

(i) $_{32}Ge^{77}$ (ii) $_{33}As^{77}$
(iii) $_{34}Se^{77}$ (iv) $_{34}Se^{78}$
(1) (ii) & (iii) (2) (i) & (ii)
(3) (ii) & (iv) (4) (ii) & (iii) & (iv)

30. For Li^{+2}, $r_2 : r_5$ will be :-

(1) 9 : 25 (2) 4 : 25
(3) 25 : 4 (4) 25 : 9

ANSWER KEY — Exercise-I

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	1	4	2	2	2	2	1	3	4	3
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	1	3	4	1	2	3	1	2	1	3
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	1	1	3	4	2	2	1	3	3	2