Chemistry [DPP]

Atomic Structure

DPP - 6

DPP-6

1. The total spin resulting from a d^7 configuration is:-

(A) $\frac{1}{2}$ (B) 2

(C) 1 (D) $\frac{3}{2}$

2. When the value of principal quantum number n is 3, the permitted value of azimuthal quantum numbers ℓ and magnetic quantum numbers 'm' are:-

(A)

ℓ	m
0	0
1	+1, 0, –1
2	+2, +1, 0, –1, –2

(B)

ℓ	m
0	1
2	+2, 1, –2
3	+3, +3, +2, 1, –2, –3

(C)

ℓ	m
0	0
1	1 2 3 2 0, 1, 2
2	+3, +2, 1, –2, –3

(D)

ℓ	m
1	0, 1
2	0, 1, 2
3	0, 1, 2, 3

3. $_{36}Kr$ has the electronic configuration ($_{18}Ar$) $4s^2\ 3d^{10}\ 4p^6$. The 39^{th} electron will go into which one of the following sub-levels :-

(A) 4f (B) 4d

(C) 3p (D) 5s

4. The atomic number of an element is 17, the number of orbitals containing electron pairs in the valency shell is:-

(A) 8 (B) 2

(C) 3 (D) 6

5. The total spin resulting from a d^9 configuration is:-

(A) $\frac{1}{2}$ (B) 2

(C) 1 (D) $\frac{3}{2}$

6. The explaination for the presence of three unpaired electrons in the nitrogen atom can be given by:-
(A) Pauli's exclusion principle
(B) Hund's rule
(C) Aufbau's principle
(D) Uncertainty principle

7. n and ℓ values of an orbital 'A' are 3 and 2, of another orbital 'B' are 5 and 0. The energy of
(A) B is more than A
(B) A is more than B
(C) A and B are of same energy
(D) None

8. No. of all subshells of $n + \ell = 7$ is:-
(A) 4 (B) 5
(C) 6 (D) 7

9. Electronic configuration  has violated :–

(A) Hund's rule
(B) Pauli's principle
(C) Aufbau principle
(D) $(n + \ell)$ rule

10. A transition metal 'X' has a configuration [Ar] $3d^5$ in its + 3 oxidation state. Its atomic number is:–

(A) 22 (B) 26
(C) 28 (D) 19

11. $4s^2$ is the configuration of the outermost orbit of an element. Its atomic number would be :–

(A) 29 (B) 24
(C) 30 (D) 19

12. Sum of the paired electrons present in the orbital with $\ell = 2$ in all the species Fe^{2+}, Co^{2+} and Ni^{+2} are:–

(A) 9 (B) 12

(C) 6 (D) 15

13. What is the electronic configuration of an element in its first excited state which is isoelectronic with O_2

(A) [Ne] $3s^2$ $3p^3$ $3d^1$

(B) [Ne] $3s^2$ $3p^4$

(C) [Ne] $3s^1$ $3p^3$ $3d^2$

(D) [Ne] $3s^1$ $3p^5$

14. The quantum number of 20th electron of Fe(Z = 26) ion would be :–

(A) 3, 2, – 2, – ½

(B) 3, 2, 0, ½

(C) 4, 0, 0, + ½

(D) 4, 1, – 1, + ½

15. Which of the following transition neither shows absorption nor emission of energy in case of Hydrogen atom :–

(A) $3p_x \rightarrow 3s$ (B) $3d_{xy} \rightarrow 3d_{yz}$

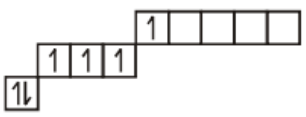
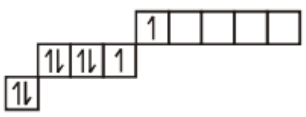
(C) $3s \rightarrow 3d_{xy}$ (D) All the above

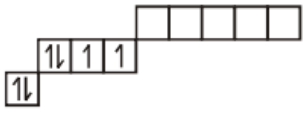
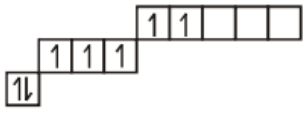
16. The atomic number of the element having maximum number of unpaired 3p electrons is (in ground state):-

(A) 15 (B) 10

(C) 12 (D) 8

17. Which one represent is in ground state configuration

(A)  (B) 

(C)  (D) 

18. The maximum probability of finding an electron in the d_{xy} orbital is :-
(A) Along the x-axis
(B) Along the y-axis
(C) At an angle of 45° from the x and y axis
(D) At an angle of 90° from the x and y axis

19. Which orbitlal has two angular nodal planes :-
(A) s (B) p
(C) d (D) f

20. A filled or half-filled set of p or d orbitals is spherically symmetric. Point out the species which has spherical symmetry :-
(A) Na (B) C
(C) Cl^- (D) Fe

21. Remaining part of atom except outer orbit is called:-

(A) Kernel (B) Core

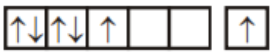
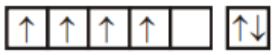
(C) Empty space (D) None of these

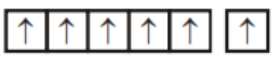
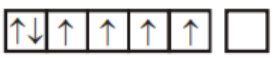
22. The electronic configuration of a dipositive metal ion M^{2+} is 2, 8, 14 and its ionic weight is 58 a.m.u. The number of neutrons in its nucleus would be :–

(A) 30 (B) 32

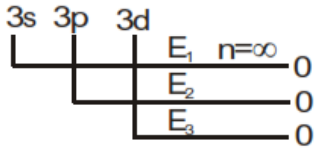
(C) 34 (D) 42

23. Which represents the correct pattern of electron filling in Cr :-

(A)  (B) 

(C)  (D) 

24. For H atom, the energy required for the removal of electron from various sub-shells is given as under:-



The order of the energies would be:-

(A) $E_1 > E_2 > E_3$

(B) $E_3 > E_2 > E_1$

(C) $E_1 = E_2 = E_3$

(D) None of these

25. In an atom having 2K, 8L, 8M and 2N electrons, the number of electrons with $m = 0$; $S = +\frac{1}{2}$ are

(A) 6 (B) 2

(C) 8 (D) 16

ANSWER KEY

1.	D	**2.**	A	**3.**	B
4.	C	**5.**	A	**6.**	B
7.	A	**8.**	A	**9.**	A
10.	B	**11.**	C	**12.**	B
13.	A	**14.**	C	**15.**	D
16.	A	**17.**	C	**18.**	C
19.	C	**20.**	C	**21.**	A
22.	B	**23.**	C	**24.**	C
25.	A				