Multiple Choice Questions with Solution:

1. Incorrect set of quantum numbers from the following is
    a. n = 4, l = 3, m_l = –3, –2, –1, 0, +1, +2, +3, m_s = –1/2
    b. n = 5, l = 2, m_l = –2, –1, +1, +2, m_s = +1/2
    c. n = 4, l = 2, m_l = –2, –1, 0, +1, +2, m_s = –1/2
    d. n = 5, l = 3, m_l = –3, –2, –1, 0, +1, +2, +3, m_s = +1/2
2. Given below are two statements : one is labeled as **Assertion (A)** and the other is labelled as **Reason (R)**.
   Assertion (A) : Ionisation enthalpy increases along each series of the transition elements from left to right. However, small variations occur.
   Reason (R) : There is corresponding increase in nuclear charge which accompanies the filling of electrons in the inner d-orbitals.In the light of the above statements,
   Choose the most appropriate answer from the options given below :
    a) (A) is correct but (R) is not correct.
    b) (A) is not correct but (R) is correct.
    c) Both (A) and (R) are correct and (R) is the correct explanation of (A).
    d) Both (A) and (R) are correct but (R) is not the correct explanation of (A).

3. Given below are two statements : one is labeled as **Assertion (A)** and the other is labelled as **Reason (R)**.
   Assertion (A) : Lithium and beryllium unlike their other respective group members form compounds with pronounced ionic character.
   Reason (R) : Lithium and Magnesium have similar properties due to diagonal relationship.
   In the light of the above statements, choose the correct answer from the options given below :
    a. (A) is true but (R) is false.
    b. (A) is false but (R) is true.
    c. (c) Both (A) and (R) are true and (R) is the correct explanation of (A).
    d. Both (A) and (R) are true but (R) is not the correct explanation of (A).
4. For a weak acid HA, the percentage of dissociation is nearly 1% at equilibrium. If the concentration of acid is 0.1 mol L^{-1}, then the correct option for its K_a at the same temperature is
    a. 1×10^{-4}
    b. 1×10^{-6}
    c. 1×10^{-5}
    d. 1×10^{-3}
5. The density of 1 M solution of compound 'X' is 1.25 g mL^{-1}. The correct option for the molality of solution is (Molar mass of compound, X = 85 g mol^{-1})
    a. 0.705 m
    b. 1.208 m
    c. 1.165 m
    d. 0.858 m

6. Consider the given reaction :

$$CH_3COCH_3 \xrightarrow{\text{dil. } Ba(OH)_2} \text{“}X\text{”}.$$

The functional groups present in compound “X” are

a. ketone and double bond
b. double bond and aldehyde
c. alcohol and aldehyde
d. alcohol and ketone.

7. The E° value for

Al^+/Al = + 0.55 V and Tl^+/Tl = – 0.34 V

Al^{3+}/Al = –1.66 V and Tl^{3+}/Tl = +1.26 V.

Identify the incorrect statement.

a. Al is more electropositive than Tl.
b. Tl^{3+} is a good reducing agent than Tl^+
c. Al^+ is unstable in solution.
d. Tl can be easily oxidised to Tl^+ than Tl^{3+}.

8. The correct order of dipole moments for molecules NH_3, H_2S, CH_4 and HF, is

a. $CH_4 > H_2S > NH_3 > HF$
b. $H_2S > NH_3 > HF > CH_4$
c. $NH_3 > HF > CH_4 > H_2S$
d. $HF > NH_3 > H_2S > CH_4$

9. Molar conductance of an electrolyte increases with dilution according to the equation :

$\Lambda_m = \Lambda_m^0 - A\sqrt{C}$, Which of the following statements are true?

A. This equation applies to both strong and weak electrolytes.
B. Value of the constant A depends upon the nature of the solvent.
C. Value of constant A is same for both $BaCl_2$ and $MgSO_4$
D. Value of constant A is same for both $BaCl_2$ and $Mg(OH)_2$.

Choose the most appropriate answer from the options given below :

a. (A) and (B) only
b. (A), (B) and (C) only
c. (B) and (C) only
d. (B) and (D) only

10. Cheilosis occurs due to deficiency of _____.

a. thiamine
b. nicotinamide
c. pyridoxamine
d. riboflavin

11. The correct value of cell potential in volt for the reaction that occurs when the following two half-cells are connected, is

$Fe^{2+}(aq) + 2e^- \rightarrow Fe(s)$, E° = –0.44 V

$Cr_2O_7^{2-}(aq) + 14H^+ + 6e^- \rightarrow 2Cr^{3+} + 7H_2O$, E° = +1.33 V

a. +1.77 V
b. +2.65 V
c. + 0.01 V
d. +0.89 V

12.

$$R-COOH \xrightarrow[\text{(ii) } H_2O/HCl]{\text{(i) "}X\text{"}} R-CH_2OH$$

$$R-CH{=}CH_2 \xrightarrow[\text{(ii) } H_2O,\ NaOH, H_2O_2]{\text{(i) "}X\text{"}} R-CH_2-CH_2-OH$$

Identify 'X' in above reactions.

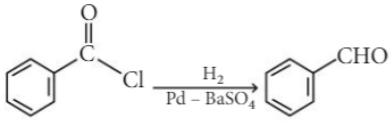
a. B_2H_6
b. $LiAlH_4$
c. $NaBH_4$
d. H_2/Pd

13. For a reaction 3A → 2B, the average rate of appearance of B is given by $\frac{\Delta[B]}{\Delta[t]}$

The correct relation between the average rate of appearance of B with the average rate of disappearance of A is given in option

a. $\frac{-\Delta[A]}{\Delta[t]}$
b. $\frac{-3\Delta[A]}{2\Delta[t]}$
c. $\frac{-2\Delta[A]}{3\Delta[t]}$
d. $\frac{\Delta[A]}{\Delta[t]}$

14. The following conversion is known as



a. Stephen reaction
b. Gattermann-Koch reaction
c. Etard reaction
d. Rosenmund reaction.

15. Which amongst the following is used in controlling depression and hypertension?
    a. Seldane
    b. Valium
    c. Equanil
    d. Prontosil
16. Which one of the following represents all isoelectronic species?
    a. Na^+, Cl^-, O^-, NO^+
    b. N_2O, N_2O_4, NO^+, NO
    c. Na^+, Mg^{2+}, O^-, F^-
    d. Ca^{2+}, Ar, K^+, Cl^-

17. Given below are two statements :

Statement I : The value of wave function, ψ depends upon the coordinates of the electron in the atom.

Statement II : The probability of finding an electron at a point within an atom is proportional to the orbital wave function.

In the light of the above statements, choose the correct answer from the options given below

a. Statement I is true but Statement II is false
b. Statement I is false but Statement II is true
c. Both Statement I and Statement II are true
d. Both Statement I and Statement II are false

18. The correct van der Waals equation for 1 mole of a real gas is

a. $(P+\frac{a}{V2})(V-b)=RT$
b. $(P+\frac{V2}{a})(V-b)=RT$
c. $(P+\frac{an2}{V2})(V^2-nb)=RT$
d. $(P+\frac{an2}{V2})(V-nb)=nRT$

19. The correct option in which the density of argon (Atomic mass = 40) is highest

a. STP
b. 0°C, 2 atm
c. 0°C, 4 atm
d. 273°C, 4 atm

20. Which of the following is correctly matched?

a. Basic oxides ⇒ In_2O_3, K_2O, SnO_2
b. Neutral oxides ⇒ CO, NO_2, N_2O
c. Acidic oxides ⇒ Mn_2O_7, SO_2, TeO_3
d. Amphoteric oxides ⇒ BeO, Ga_2O_3, GeO

SOLUTION:

QUESTION	ANSWER		QUESTION	ANSWER
1	b		11	a
2	c		12	a
3	b		13	c
4	c		14	d
5	d		15	c
6	d		16	d
7	b		17	a
8	d		18	a
9	d		19	c
10	d		20	c