STD: XI   ONE MARK TEST – 4   Lesson: 3 & 8
**Marks: 30 / Time: 45 Min.**   **CHEMISTRY**
Choose the correct answer.

1. Which of the following will have lowest first ionization enthalpy ?
   a) Na   b) Al   c) Mg   d) Si

2. The element with positive electron gain enthalpy is
   a) Hydrogen   b) Sodium   c) Argon   d) Fluorine

3. The electronic configuration of the elements A and B are $1s^2, 2s^2, 2p^6, 3s^2$ and $1s^2, 2s^2, 2p^5$, respectively. The formula of the ionic compound that can be formed between these elements is
   a) AB   b) AB_2 c) A_2B d) none of the above

4. In the modern periodic table, the period indicates the value of :
   a) atomic number   b) atomic mass
   c) principal quantum number   d) azimuthal quantum number

5. Which one of the following arrangements represent the correct order of least negative to most negative electron gain Enthalpy
   a) Al< O<C< Ca< F   b) Al < Ca<O< C< F   c) C < F < O < Al < Ca   d) Ca < Al < C < O < F

6. The law of triad is applicable to
   a) Chlorine, bromine and iodine   b) Hydrogen, oxygen and nitrogen
   c) Sodium, neon and calcium   d) All of the above

7. In a given shell the order of screening effect is
   a) s > p > d > f   b) s > p > f > d   c) f > d > p > s   d) f > p > s > d

8. The size of isoelectronic species F^-, Ne and Na^+ is affected by
   a) nuclear charge (Z)   b) valence principal quantum number (n)
   c) electron-electron interaction in the outer orbitals d) none of the factors because their size is the same

9. **Assertion:** Helium has the highest value of ionization energy among all the elements known
   Reason: Helium has the highest value of electron affinity among all the elements known
   a) Both assertion and reason are true and reason is correct explanation for the assertion
   b) Both assertion and reason are true but the reason is not the correct explanation for the assertion
   c) Assertion is true and the reason is false.
   d) Both assertion and the reason are false

10. Which of the following has highest ionization potential?
    a) Sodium   b) Magnesium   c) Carbon   d) Fluorine

11. In which of the following options the order of arrangement does not agree with the variation of property indicated against it?
    a) I < Br < Cl < F (increasing electron gain enthalpy)
    b) Li < Na < K < Rb (increasing metallic radius)
    c) Al^{3+}< Mg^{2+}< Na^+ < F^- (increasing ionic size)
    d) B < C < O < N (increasing first ionization enthalpy)

12. In the first transition series the incoming electron enters the
    a) 4d-orbital   b) 3d-orbital   c) 5d-orbital   d) 6d-orbital

13. How does electron affinity change when we move from left to right in a period in the periodic table?
    a) Generally increases   b) Generally decreases
    c) Remains unchanged   d) First increases and then decreases

14. In the third period, the first ionization potential is of the order
    a) Na > Al > Mg > Si > P   b) Na < Al < Mg < Si < P
    c) Mg > Na > Si > P > Al   d) Na< Al < Mg < P < Si

15. Which of the following hydroxide is most basic ?
    a) Mg (OH)$_2$ b) Ba (OH)$_2$ c) Ca(OH)$_2$ d) Be (OH)$_2$

16. Which of the following does not alter the equilibrium?
    a) catalyst   b) concentration   c) temperature   d) pressure

17. The equilibrium constant for a reaction at room temperature is K_1 and that at 700 K is K_2. If $K_1 > K_2$, the
    a) The forward reaction is exothermic   b) The forward reaction is endothermic
    c) The reaction does not attain equilibrium   d) The reverse reaction is exothermic

18. If x is the fraction of PCl_5 dissociated at equilibrium in the reaction $PCl_5 \rightleftharpoons PCl_3 + Cl_2$ then starting wi
    0.5 mole of PCl_5, the total number of moles of reactants and products at equilibrium is
    a) 0.5 − x   b) x + 0.5   c) 2x + 0.5   d) x + 1

19. For the reaction $PCl_3(g) + Cl_2(g) \rightleftharpoons PCl_5(g)$ at 250°C, the value of K_c is 26, then the value of K_p at the s
    temperature will be
    a) 0.61   b) 0.57   c) 0.83   d) 0.46

20. A 20 litre container at 400 K contains $CO_2(g)$ at pressure 0.4 atm and an excess of SrO (neglect the vol
    of solid SrO). The volume of the container is now decreased by moving the movable piston fitted in the
    container. The maximum volume of the container, when pressure of CO_2 attains its maximum value wil
    Given that: $SrCO_3 (S) \rightleftharpoons SrO (S) + CO_2 (g)$ $K_p = 1.6$ atm
    a) 2 litre   b) 5 litre   c) 10 Litre   d) 4 litre

21. For the reaction, $AB(g) \rightleftharpoons A(g) + B(g)$ at equilibrium, AB is 20% dissociated at a total pressure of P,
    equilibrium constant K_p is related to the total pressure by the expression
    a) $P = 24 K_p$ b) $P = 8 K_p$.   c) $24 p = K_p$ d) none of these

22. A reversible reaction is one which
    a) Proceeds in one direction   b) proceeds in both direction
    c) proceeds spontaneously   d) All the statements are wrong

23. Theory of 'active mass' indicates that the rate of chemical reaction is directly proportional to the _____ .
    a) Equilibrium constant   b) Properties of reactants
    c) Volume of apparatus   d) Concentration of reactants

24. Consider the reaction where $K_p = 0.5$ at a particular temperature $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$ if the three
    gases are mixed in a container so that the partial pressure of each gas is initially 1 atm, then which one of
    the following is true
    a) more PCl_3 will be produced   b) more Cl_2 will be produced
    c) more PCl_5 will be produced   d) none of these

25. The elements with atomic numbers 35 belongs to
    a) d-block   b) f-block   c) p-block   d) s-block

26. K_1 and K_2 are the equilibrium constants for the reactions respectively.

$$N_2(g) + O_2(g) \xrightarrow{\ K_1\ } 2NO(g)$$

$$2NO(g) + O_2(g) \xrightarrow{\ K_2\ } 2NO_2(g)$$
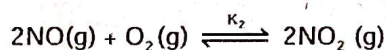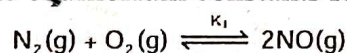
    What is the equilibrium constant for the reaction $NO_2(g) \rightleftharpoons \frac{1}{2}N_2(g) + O_2(g)$
    a) $K_1 = \frac{1}{\sqrt{K_2}}$ b) $K_2 = K_1^{-1/2}$ c) $K_1^2 = 2K_2$ d) $\frac{k_1}{2} = K_2$

27. Which of the following is not a general characteristic of equilibrium involving physical process
    a) Equilibrium is possible only in a closed system at a given temperature
    b) The opposing processes occur at the same rate and there is a dynamic but stable condition
    c) All the physical processes stop at equilibrium
    d) All measurable properties of the system remains constant

28. In which of the following equilibria, the value of K_p is less than K_c?
    a) $H_2 + I_2 \rightleftharpoons 2HI$ b) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ c) $N_2 + O_2 \rightleftharpoons 2NO$ d) $CO + H_2O \rightleftharpoons CO_2 + H_2$

29. If K_b and K_f for reversible reactions are 0.8×10^{-5} and 1.6×10^{-4} respectively, the value of the equilibrium
    constant is,
    a) 20   b) 0.2×10^{-1} c) 0.05   d) none of these

30. According to the law of mass action rate of a chemical reaction is proportional to
    a) concentration of reactants   b) molar concentration of reactants
    c) concentration of products   d) molar concentration of products

1) d) Si

2) c) Argon

3) b) AB_2

4) c) principal quantum number.

5) d) Ca < Al < C < O < F

5) a) chlorine, bromine and iodine.

7) a) s > p > d > f

8) a) nuclear charge (z)

9) c) Assertion is true and the reason is false

0) d) Fluorine

11) a) I < Br < Cl < F (increasing electron gain enthalpy).

12) b) 3d-orbital

13) a) Generally increases.

14) b) Na < Al < Mg < Si < P

15) d) Be $(OH)_2$

16) a) catalyst.

17) a) the forward reaction is exothermic.

18) b) x + 0.5

19) a) 0.61

20) b) 5 litre

21) a) P = 24 K_p

22) b) proceeds in both direction.

23) d) concentration of reactants.

24) c) more PCl_5 will be produced.

25) c) p-block.

26) a) $F_1 = \dfrac{1}{\sqrt{E_2}}$

27) c) All the physical process stop at equilibrium.

28) b) $N_2 + 3H_2 \rightleftharpoons 2NH_3$

29) a) 20

30) b) molar concentration of reactants.

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