Total No. of Printed Pages:# 2

BSC_SEM_V

NC-31 Physical Chem+ Inorganic Chemistry -XIII (Regular)(CBCS) OR

Time: One Hour **Max. Marks: 40**

Instructions

- Attempt all 40 questions

1 Third order reaction means-

(A) Sum of powers in rate law equation is three (B) Three molecules changes their concentration during reaction. (C) Both A and B. (D) None of the above.

2 The reaction in which formed product also reacts to give back the reactants is called-

(A) Consecutive reaction (B) Opposing reaction (C) Parallel reaction (D) Reaction mechanism

3 The moment of Inertia for diatomic Rigid Rotor is-

(A) $I = \mu r^2$ (B) $I = \mu^2 r$ (C) $I = \mu r$ (D) $I = \mu^2 r^2$

4 Vibrational spectra appears in-

(A) X-ray (B) Gamma ray (C) Microwave region (D) IR region

5 The relation between Bond energy and force constant is -

(A) B.E $\propto$ K (B) B.E $\propto$ 1/K. (C) 0 (D) B.E $\propto 1/\sqrt{K}$

6 Frank-Condon Principle is-

(A) An electronic transition takes place so rapidly (B) During electronic transition bond length not changes appreciably (C) Both A and B (D) None of these

7 The lines having longer wavelength (shorter frequency) than that of incident light are called-

(A) Stokes lines (B) Antistoke's lines (C) Rayleigh lines (D) X- Rays

8 If υ_i is frequency of incident light υ_s is frequency of scattered light then Raman shift ($\Delta\upsilon$)is-

(A) $\Delta\upsilon = \upsilon_i - \upsilon_s$ (B) $\Delta\upsilon = \upsilon_i + \upsilon_s$ (C) $\Delta\upsilon = \upsilon_i / \upsilon_s$ (D) $\Delta\upsilon = \upsilon_s/\upsilon_i$

9 Raman shift ($\Delta\upsilon$) is zero in case of-

(A) Stokes lines. (B) Antistokes lines. (C) Rayleigh lines. (D) Both A and B.

10 Nernst Distribution law is valid at -

(A) Constant temperature. (B) Low Concentration. (C) Dissolved solute remains in its molecular state. (D) All of above.

11 The modification of Distribution law for Association of solute in one of the solvent is-

(A) $K_D = C_1/\sqrt{C_2}$ (B) $K_D = C_1/C_2$ (C) $K_D = C_1/C_2$ X (1-x) (D) Both B and C

12 The Henry's law equation is-

(A) K = C X P (B) C = K.P (C) P= C X K (D) $C = K\sqrt{P}$

13 The more efficient solvent extraction method is-

(A) Single extraction. (B) Multiple extraction. (C) Double extraction. (D) None of these

14 $\pi \rightarrow \pi^*$ Transition occurs in molecule having-

(A) π - electrons (B) Lone pair of electron. (C) σ – electrons. (D) Both A and B.

15 The electronic spectra is obtained when molecule is exposed to-

(A) Microwave radiation. (B) IR radiation. (C) UV and visible radiation. (D) γ - rays

16 Selection rule for simple Harmonic oscillator is -

(A) $\Delta V = \pm 1$ (B) $\Delta V = \pm 2$ (C) $\Delta V = 0, \pm 1$ (D) $\Delta V = 0, \pm 2$

17 Energy equation for diatomic molecule as a Rigid rotator in cm^{-1} is-

(A) $\varepsilon_J = BJ(J+1)$ (B) $\varepsilon_J = BJ^2(J+1)$ (C) $\varepsilon_J = BJ(J+1)^2$ (D) $\varepsilon_J = BJ(J+ n)$

18 Spacing distance between Rotational Spectra of rigid rotor is-

(A) 1B (B) 2B (C) 3B (D) 4B

19 Unit of Third order reaction is-

(A) S^{-1} (B) $Mol\ l^{-1}\ S^{-1}$ (C) $Mol^2\ l^{-2}\ S^{-1}$ (D) $Mol^{-2}\ l^2\ S^{-1}$

20 Hydrogen-chlorine reaction is an example of-

(A) Thermal reaction. (B) Photo chemical reaction. (C) Chain reaction. (D) Both B and C

21 The consecutive reaction means-

(A) Final product is formed through more path to give two or more products (B) The final product reacts to give back the reactants. (C) Final product is formed through one or more intermediate steps. (D) None of these.

22 If B is rotational constant of diatomic molecule and B' is rotational constant of their isotope then-

(A) B' > B (B) B > B' (C) B' = B (D) Both B and C

23 By using Distribution law we can determine -

(A)Solubility of solute (B)Association of solute (C)Dissociation of solute (D)All of the above

24 For the study of the distribution law the two solvents should be-

(A)Volatile (B)Reacting with each other (C)Miscible (D)Non-miscible

25 $K_D = C_1/C_2$ (1-x) is used for-

(A)Dissociation of solute (B)Association of solute (C)Energy of solute (D)None of these

26 If solute 'A' is dimerized in one of the solvent then following expression is applicable-

(A)$K_D = C_1 / C_2$ (B)$K_D = C_1 / \sqrt[2]{C_2}$ (C)$K_D = C_1 / \sqrt[3]{C_2}$ (D)$K_D = C_1 / C_2{}^2$

27 The selection rule for diatomic rigid rotator is-

(A)$\Delta J = 0$ (B)$\Delta J = \pm 1$ (C)$\Delta J = \pm 2$ (D)$\Delta J = \pm 3$

28 True statement for mononuclear metal carbonyl is-

(A)Only one metal atom per molecule of metal carbonyl (B)Formed by the metal having even atomic number (C)Vaporized without decomposition (D)All of the above

29 Colorless liquid metal carbonyl is-

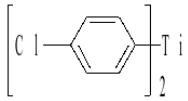
(A)$Fe_2(CO)_9$ (B)$Ni(CO)_4$ (C)$Fe_3(CO)_{12}$ (D)$Co_2(CO)_8$

30 Bridge carbonyl groups present in $Fe_2(CO)_9$ is-

(A)1 (B)2 (C)3 (D)4

31 Metal carbonyl present in two isomeric form is-

(A)$Fe_2(CO)_9$ (B)$Fe_3(CO)_{12}$ (C)$Co_2(CO)_8$ (D)$Mn_2(CO)_{10}$

32 

(A)Bis(4-chlorophenyl) titanium (II) (B)Di(4-chlorophenyl) titanium(I) (C)4-chlorophenyl titanium(III) (D)Bis(4-chlorophenyl) titanium (I)

33 Dibenzene Chromium is-

(A)Ionic organometallic compound (B)Cavalent organometallic compound (C)Electrondeficient organometallic compound (D)Transition metal organometallic compound

34 Used as component of Ziegler-Natta-Catalyst-

(A)Organotin compound (B)Organolithium compound (C)Organoaluminium compound (D)Organotitanium compound

35 Ethyl lithium reacts with aldehydes and ketones gives-

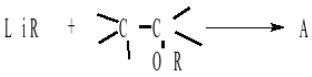
(A)Alcohols (B)Acids (C)Esters (D)Ethers

36 Alkyl tin compounds are prepared by treating tin halides with alkyl halides in presence of sodium. This reaction is known as-

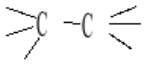
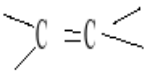
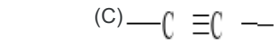
(A)Kolbes reaction (B)Witting reaction (C)Wurtz reaction (D)None of the above

37 ----- compounds act as anticancer drugs.

(A)Organotin (B)Organotitanium (C)Both A & B (D)None of the above

38 

In the above reaction 'A' is-

(A)  (B)  (C)  (D)None of the above

39 In the structure of $Al_2(CH_3)_6$ the bridge Al-CH_3-Al bond is-

(A)Two centre -Two electron (B)Three centre -Two electron (C)Three centre-Three electron (D)Two centre – Three electron

40 Organotitanium compounds are stable when the organicgroup is-

(A)Cyclobutadiene (B)Cyclopentadiene (C)Alkyl (D)Aryl