CG-11-2020
WINTER EXAM 2020
Subject Name : RB-05_CHEMISTRY - Physical Chem+ Inorganic Chemistry –XIII (Regular)(CBCS) OR_V

Date : 17/03/2021 Duration : 60 min.

Instruction / सुचना / :-

* Follow the detail instructions given on OMR Sheet
* ओ एम आर वरील सर्व सूचनांचे पालन करावे.

Q.1

IUPAC Nomenclature of $Fe(C_5H_5)_2$ is _____

A) Bis (η^5 - cyclopentadienyl) iron
B) Bis (η^5 - cyclopentadienyl) ferrate
C) Di (η^5 - cyclopentadienyl) iron
D) Di (η^5 - cyclopentadienyl) ferrate

A]a C]c
B]b D]d

Q.2

The dimethyl tin chloride, $[(CH_3)_2 Sn Cl_2]$ has a tendency to polymerise thorugh _____

A) Sn - C bond
B) Sn - C1 bond
C) C- C1 bond
D) All of the above

A]a C]c
B]b D]d

..... is ionic organometallir compound.

A) $(CH_3)_4$ Si
B) $AI_2 (CH_3)_6$
C) Na C_6H_5
D) Fe $(C_5H_5)_2$

Q.3

A]a C]c
B]b D]d

Q.4

$2\ R - x + 2\ Hg \xrightarrow{A} R_2H_g + H_gX_2$, is the above reaction 'A' is .....

A) K / Hg
B) Zn / Hg
C) Hg CI_2
D) Na / Hg

A]a C]c
B]b D]d

Q.5 Alkyl tin cmopounds are prepared by treating tin halides with alkyl halides in presence of sodium. This reaction is known as .....

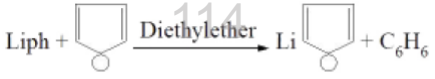
A]Kolbe's reaction C]Wurtz reaction
B]Witting reaction D]None of the above

Q.6 Oranoaluminium compounds are used as .....

A]Polymerisation catalyst C]Both (A) & (B)
B]Anti-cancer drug D]None of the above

Q.7 ..... organometallic compound includes three centre - two electron bond.

A]Li C]Ti
B]Al D]Sn



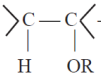
The above reaction is a type of.

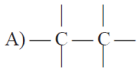
A) Metal hydrogen exchange
B) Metal halogen exchange
C) Metal metal exchange
D) None of the above

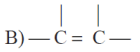
Q.8

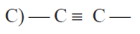
A]a C]c
B]b D]d

In the reaction,

LiR +  → A, Where 'A' is ....

A) 

B) 

C) 

D) All of the above

Q.9

A]a C]c
B]b D]d

$Ni(CO)_4$ is .....
A) Diamagnetic
B) Paramagnetic
C) Ferromagnetic
D) None of the above

Q.10

A]a C]c
B]b D]d

Q.11

Number of metal-metal bond in $Ir_4(CO)_{12}$ are .....
A) 2
B) 4
C) 6
D) 8

A]a C]c
B]b D]d

Q.12

Which one of the following exist in two isomeric forms ?
A) $Fe_2(CO)_9$
B) $Fe_3(CO)_{12}$
C) $CO_2(CO)_8$
D) $Mn_2(CO)_{10}$

A]a C]c
B]b D]d

$Fe_2(CO)_9$ has ..... CO groups
A) Two bridging & Seven terminal
B) Three bridging & Six terminal
C) Five bridging & Seven terminal
D) None of the above

Q.13

A]a C]c
B]b D]d

Q.14 In EMR electric and magnetic waves are ..... to each other.

A]Perpendicular C]Spherical
B]Parallel D]Eliptical

Q.15

Equation of M.I. for diamagnetic rigid rotatory is .....
A) $I = mr^2$
B) $I = \mu r^2$
C) $I = \sqrt{\mu r}$
D) $I = Mr$

A]a C]c
B]b D]d

Q.16 2B is constant distance between ..... spectra.

A]Raman C]Rotational
B]Vibrational D]Electronic

The value of reduced mass μ is .....

A) $\mu = \frac{M_1 M_2}{M_1 - M_2}$

B) $\mu = \frac{M_1 - M_2}{M_1 + M_2}$

C) $\mu = \frac{M_1 M_2}{M_1 + M_2^2}$

D) $\mu = \frac{M_1 M_2}{M_1 + M_2}$

Q.17

A]a C]c

B]b D]d

Q.18

In the equation $E_v = \left(V + \frac{1}{2}\right)$ w, 'v' is called .....

A) Vibrational quantum number

B) Rotational quantum number

C) Velocity

D) Volume

.

A]a C]c

B]b D]d

Q.19

Give the relation between bond energy and force constant

A) Bond energy ∝ Force constant

B) Bond energy ∝ √Force constant

C) Bond energy $\propto \frac{1}{\text{Force constant}}$

D) Bond energy = Force constant

.

A]a C]c

B]b D]d

Q.20 Selection rule for simple harmonic oscillator is .....

A]Δ V = ± 1 C]Both A and B

B]Δ J = ± 1 D]None of these

Q.21 Frank condon principal is stated as .....

A]Electric transition takes place so rapidly C]Both A and B

B]During electronic transition internuclear distance not changes. D]None of these

Q.22 According to molecular orbital theory electrons can be classified into .....

A]6 - electrons C]n(non bonding) electrons

B]TT = electrons D]All of the above

Q.23 σ →σ transitoin occurs in .....

A]visible region C]X-ray

B]UV region D]Gamma ray

Q.24 Raman shift in case of stokes lines is .....

A]Negative C]Unknown

B]Positive D]Zero

Q.25 The lines having lower frequency than that of the incident light is called .....

A]Stokes lines C]Rayleigh line

B]Antistokes line D]All of the above

Q.26 In the equation μ = ∝ E, where '∝' is .....

A]∝- ray C]Polarizibility

B]Dissociation constant D]Constant

Q.27 In pure rotational Raman spectra the first stoke line obtained at distance .....

A]2 B C]6 B

B]4 B D]B

Equation for Nernst's distribution law is .....

1) $Kd = \frac{C_1}{C_2}$

B) $Kd = \sqrt{\frac{C_1}{C_2}}$

C) $Kd = C_1^2 / C_2^2$

D) $Kd = \frac{C_1}{C_2}$

Q.28

A]a C]c

B]b D]d

Henry's law equation is .....

A) $k = C \times P$

B) $C = K \times P$

C) $P = C \times K$

D) $C = K \times \sqrt{P}$

Q.29

A]a C]c

B]b D]d

Q.30 The more efficient solvent extraction method is .....

A]Single extraction C]Multiple extraction

B]Double extraction D]Heating

Q.31 For study of distribution law the two solvent are in contact should be .....

A]Volatile C]Miscible

B]Reacting with each ether D]Non-miscible

Q.32

If solute 'A' dimerize in one of the solvent then following expression is applicable .....

A) $Kd = \frac{C_1}{C_2}$

B) $Kd = \frac{C_1}{2\sqrt{C_2}}$

C) $Kd = \frac{C^1}{3\sqrt{C^2}}$

D) $Kd = \frac{C_1}{C_2^{\ 2}}$

A]a C]c

B]b D]d

Q.33 By using distribution law we can determine .....

A]Solubility of solute C]Dissociation of solute

B]Association of solute D]All of these

$Kd = \frac{C_1}{C_2 (I - x)}$ is used for .....

A) Association of solute

B) Dissociation of solute

C) Energy of solute

D) None of these

Q.34

A]a C]c

B]b D]d

Q.35 The reaction in which formed product gives back the reactant is called .....

A]Parallel reaction C]Opposing reaction

B]Consecutive reaction D]Reaction mechanism

Q.36

The integrated rate equation for third order reaction is .....

A) $K = \frac{1}{t} \times \frac{x(2a - x)}{2a^2 (a - x)^2}$

B) $k = \frac{1}{t} \times \frac{x}{a(a - x)}$

C) $K = \frac{1}{t} \ln \frac{x}{(a - x)}$

D) $k = \frac{d[A]}{dt}$

A]a C]c

B]b D]d

Q.37 The reaction which takes place in more than two steps is called .....

A]Parallel reaction C]Opposing reaction

B]Consecutive reaction D]Reaction mechanism

$T_{1/2} \propto \frac{1}{a^2}$ for .....

A) First order reaction

B) Second order reaction

C) Third order reaction

D) Zero order reaction

Q.38

A]a C]c

B]b D]d

Q.39 Dimerization of anthracine is an example of .....

A]Photochemical reactoin
B]Dark reaction
C]Both A and B
D]None of these

The unit of third order reaction is .....

A) $mol^{-2}\ l^{2}\ time^{-1}$

B) $mol^{-1}\ l^{-2}\ time^{1}$

C) $mol^{2}\ l^{-2}\ time^{-2}$

D) $mol^{-3}\ l^{-3}\ time^{-3}$

Q.40

A]a
B]b
C]c
D]d