

SEEDS COACHING CENTER –STUDY MATERIALS -9600736379

PG-TRB

CHEMISTRY





(MODEL TEST -1)

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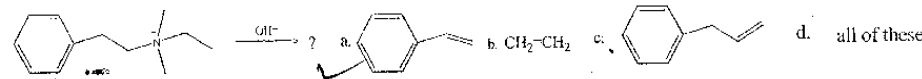
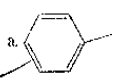
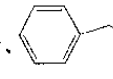
PG-TRB – CHEMISTRY

(MODEL TEST -1)

Choose The Best Alternative From The Choices Given:

- Which of the following DOES NOT contain any asymmetric carbon but can show enantiomerism
a. Lactic acid b. 1,3-pentadiene c. Tartaric acid ~~d. 2,3-pentadiene~~
- The most stable conformation of cis-1,3-dimethylcyclohexane is
a.  b.  c.  d. 
- The correct order of priority of ligands $-\text{NO}_2$, $-\text{C}=\text{N}$, $-\text{NH}_2$ and $-\text{CH}_2\text{NH}_2$ in absolute configuration of enantiomer is
~~a. $\text{NO}_2 > \text{NH}_2 > \text{C}=\text{N} > \text{CH}_2\text{NH}_2$~~ b. $\text{NO}_2 > \text{C}=\text{N} > \text{NH}_2 > \text{CH}_2\text{NH}_2$ c. $\text{NH}_2 > \text{NO}_2 > \text{C}=\text{N} > \text{CH}_2\text{NH}_2$
d. $\text{NH}_2 > \text{NO}_2 > \text{CH}_2\text{NH}_2 > \text{C}=\text{N}$
- The geometry of chiral center of allenes can be
a. Tetrahedral b. linear ~~c. trigonal planar~~ d. pyramidal
- The octahedral complex which shows both fac- & -mer isomers are
~~a. triglycinato cobalt(III)~~ b. tris(en) cobalt(III) c. dichlorodiglycinato cobalt(III)
d. tris oxalate cobaltate (III)
- Epoxidation of cis-2-butene in presence of peracid gives
a. racemic mixture ~~b. meso isomer~~ c. trans-epoxy butane d. none of these
- In the Nessler's reagent, the ion is.....
a. Hg^{2+} b. Hg^+ c. $[\text{HgI}_2]^{2-}$ ~~d. $[\text{HgI}_4]^{2-}$~~
- The complexes $[\text{Co}(\text{NH}_3)_6]$, $[\text{Cr}(\text{CN})_6]$ and $[\text{Cr}(\text{NH}_3)_6]$, $[\text{Co}(\text{CN})_6]$ are example of
~~a. coordination isomerism~~ b. Hydration isomerism c. linkage isomerism d. none
- Incorrect statement about the stability of complexes is
a. chelation increases stability increases b. greater charge and smaller size increase the stability
~~c. higher electronegativity and high oxidation of metal ion decrease the stability~~ d. more basic ligand, greater stability
- Optically inactive compound from the following
a. cis-decalin ~~b. trans-decalin~~ c. trans-cyclooctene d. none of these
- When cyclohexene is brominated, the product is
~~a. racemic mixture~~ b. cis-1,2-dibromocyclohexane c. 60% cis & 40% trans d. meso
- Among the following species, the one having highest bond strength is
a. O_2 ~~b. O_2^+~~ c. O_2^- d. O_2^{2-}
- Metal-deficiency defects observed in
~~a. FeO~~ b. NaCl c. CsCl d. AgBr
- The most stable ionic compound from the following is
~~a. LiF~~ b. LiCl c. LiBr d. LiI
- In which of the following, the structure parameter $\lambda > 0$
a. NiAl_2O_4 b. NiFe_3O_4 c. CoFe_3O_4 ~~d. all of these~~
- The radius of Zn^{2+} and S^{2-} ions are 0.74 \AA and 1.84 \AA respectively. Then, the C.N and geometry of ZnS solid is
~~a. 4; Td~~ b. 3; trigonal c. 8; bcc d. 6, Oh
- Non-aqueous polar aprotic solvent and high dielectric non-aqueous solvent from the following is
~~a. SO_2 & H_2O~~ b. SO_2 & NH_3 c. NH_3 & HF d. SO_2 & H_2O
- When lone pairs are present in a molecule, the bond angles are
~~a. smaller than expected~~ b. larger than expected c. no change in bond angle d. not determined
- Photo luminescent material Willimite from the following is
~~a. Zn_2SiO_4~~ b. $\text{CaMg}(\text{SiO}_3)_2$ c. $\text{Ca}_5(\text{PO}_4)_3\text{F}$ d. $\text{Ca}_5(\text{PO}_4)_3$

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20. Which of the following has largest ionic radius?
 a. Na⁺ b. Mg²⁺ c. Li⁺ d. Cs⁺
21. Which one of the following has high bond energy?
 a. HF b. HCl c. HBr d. HI
22. Neel temperature is related to
 a. ferromagnetism b. hysteresis c. anti-ferromagnetism d. paramagnetism
23. Treatment of 2-methyl-2-butene with HBr in the presence of peroxide yields
 a. 1^o-alkyl bromide b. 2^o-alkyl bromide c. 3^o-alkyl bromide d. dibromide
24. Hydrolysis of epoxides gives
 a. trans-diols b. cis-diols c. both cis and tran diols d. dicarboxylic acid
25.

 a.  b. CH₂=CH₂ c.  d. all of these
26. Skraup synthesis to prepare
 a. pyrrole b. quinoline c. isoquinoline d. Indole
27. Electrophilic substitution i.e nitration on pyrrole gives
 a. 2-nitropyrrole b. 3-nitro pyrrole c. 2,3,4,5-tetra nitro pyrrole d. N-nitropyrrole
28. The repeating unit of Nucleic acid is
 a. Nucleotides b. nucleosides c. carbohydrates d. phosphate groups
29. Cellulose has
 a. 1,4-β-glycosidic linkage b. 1,4-α-glycosidic linkage c. 1,2-β-glycosidic linkage d. 1,2-α-glycosidic linkage
30. 1-Butyne on hydroboration followed by oxidation gives
 a. ketone b. alcohol c. aldehyde d. all of these
31. Acetylene undergo Ozonolysis gives
 a. 1 mole HCHO + 1 mole HCOOH b. 2 moles of HCHO c. 2 moles of HCOOH d. 2 moles of keton
32. Hydration of 2-methyl-2-butene in presence of acid gives
 a. 2-methyl-2-butanol b. 3-methyl-2-butanol c. 2-methyl-1-butanol d. 1-methyl -2-butane
33. In which of the following is used as both nucleophile as well as solvent in solvolysis reaction
 a. H₂O b. NH₃ c. ethanol d. all of these
34. The type of radiation emitted during the conversion of ²⁴₁₁Na to ²⁴₁₂Mg is
 a. α-ray b. β-ray c. γ-ray d. positron
35. Nuclear shell model is deals with
 a. binding energy b. stability of nuclei c. both a & b d. none of these
36. Fermi units is the measurement of
 a. nuclear size b. nuclear density c. nuclear radius d. Q-value
37. Half-life period of ¹²⁵₅₃I is 60 days. What % of original radioactivity would be present after 180 days.
 a. 12.5% b. 6.25% c. 25% d. 50%
38. $4\text{}^1_1\text{H} \rightarrow 4\text{}^4_2\text{He} + x?$ x is
 a. γ-ray b. β-ray c. positron d. none of these
39. If the half-life of a radioactive nucleus is 10³s, the disintegration constant λ is equal to
 a. 6.93x10³s b. 6.93x10⁻⁴s c. 6.93x10⁻⁴s⁻¹ d. 6.93x10⁻²s⁻¹
40. 20e⁻ species from the following is
 a. Ferrocene b. molybdopene c. Nickelocene d. Cobaltocene
41. CRO process is used to synthesize
 a. ethylene to acetaldehyde b. terminal alkene to aldehyde c. ethylene to ethane d. ethylene to polymer
42. The geometry of Zeise salt is
 a. Td b. square planar c. Oh d. square pyramidal

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43. In the presence of free rotation in ferrocene, it undergoes Friedel-Crafts acetylation gives
 a. only one isomer of 1,1'-diacetyl ferrocene b. two isomer of 1,1'-diacetyl ferrocene c. three isomer of 1,1'-diacetyl ferrocene d. no product
44. Wilkinson catalyst is
 a. square planar 18e- species b. square planar 16e-species c. Td 16e-species d. Oh 16e- species
45. The second lowest state of particle in a cubic box is
 a. non-degenerate b. doubly-degenerate c. triply degenerate d. six-fold degenerate
46. The eigen value of $d^2/dx^2 (e^{ikx})$ is
 a. ik b. 0 c. $-k^2$ d. $-ik^2$
47. The radiation observed in the visible-region of H-spectrum is
 a. Lyman b. Balmer c. Pfund d. Brackett
48. The energy of photon having a wavelength 1.5 \AA is ($h = 6.626 \times 10^{-34} \text{ J s}$)
 a. $10.564 \times 10^{-16} \text{ J}$ b. $13.254 \times 10^{-16} \text{ J}$ c. $18.292 \times 10^{-16} \text{ J}$ d. $16.876 \times 10^{-16} \text{ J}$
49. The radius of orbit of an e^- in the first excited state of hydrogen atom is
 a. a_0 b. $2a_0$ c. $3a_0$ d. $4a_0$
50. In the Compton effect, the Compton wavelength corresponding to the scattering angle equal to
 a. 90° b. 50° c. 45° d. 180°
51. The speed of 1.0g projectile is known to be within $1 \times 10^{-6} \text{ m/s}$. The minimum uncertainty in position is
 a. $5 \times 10^{-26} \text{ m}$ b. $3 \times 10^{-26} \text{ m}$ c. $6 \times 10^{-26} \text{ m}$ d. $4 \times 10^{-26} \text{ m}$
52. Staggered conformation of ferrocene has a point group
 a. D_{5h} b. D_{5d} c. D_{2h} d. Oh
53. The eigen value of $d^2/dx^2 (\sin 2x)$ is
 a. -4 b. 16 c. 4 d. 24
54. The selection rule for combined vibrational and rotational transitions are
 a. $\Delta v = \pm 1$ & $\Delta J = \pm 1$ b. $\Delta v = \pm 2$ & $\Delta J = \pm 2$ c. $\Delta v = -1$ & $\Delta J = +1$ d. $\Delta v = \pm 2$ & $\Delta J = \pm 1$
55. Which of the following diatomic molecule will not give a rotational spectrum and gives vibrational Raman spectrum?
 a. N₂ b. O₂ c. H₂ d. all of these
56. Reduced phase rule for 3-component system is
 a. $F = 5 - P$ b. $F = 4 - P$ c. $F = 2 - P$ d. $F = 3 - P$
57. Mean activity co-efficient of an electrolyte is given by
 a. $\log \gamma_{\pm} = -Az + z \sqrt{I}$ b. $\log \gamma_{\pm} = -Az + z \sqrt{C}$ c. $\log \gamma_{\pm} = -Iz + z \sqrt{A}$ d. none of these
58. How many peaks would you expect for CuSO₄·5H₂O in DTA?
 a. 6 b. 5 c. 4 d. 2
59. For inert gas Cp/Cv value is
 a. 1.66 b. 1.02 c. 24 d. 12.47
60. Ferro and anti-ferro magnetic materials can be investigated by
 a. X-ray e- diffraction b. X-ray neutron diffraction c. DTA d. TGA
61. R_f value is always
 a. zero b. >1 c. <1 d. cannot be predicted
62. In a reversible isothermal process, the change in internal energy is
 a. zero b. positive c. negative d. not determined
63. Which of the following particle is called fermions
 a. proton and electron b. particles are distinguishable c. having integral spin d. all of these
64. The number of components present in KCl-NaBr-H₂O system is
 a. 3 b. 5 c. 4 d. 2
65. The state function which is intensive property from the following
 a. internal energy b. chemical potential c. free energy d. entropy

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66. Temperature dependence equilibrium constant is called
 a. Van't Hoff equation b. Kirchhoff equation c. Gibbs-Helmholtz d. Gibbs-Duhem
67. Freundlich isotherm is not applicable at
 a. High pressure b. low pressure c. 273K d. room temperature
68. The E_a for the forward reaction is 40 kJ/mol and that for the reverse reaction is 60 kJ/mol. The reaction is
 a. Exothermic b. endothermic c. chain reaction d. spontaneous
69. The wrong statement from the following against catalysis is
 a. a catalyst can initiate the reaction b. it does not alter the equilibrium constant c. a catalyst remains unchanged at the end of reaction d. catalysts are sometime very specific in respect of a reaction
70. Generally adsorption increases when
 a. temperature increases b. temperature decreases c. temperature remains constant d. none of these
71. Debye-Huckel-Onsager equation is applicable to
 a. weak electrolytes b. strong electrolytes c. non-electrolytes d. all electrolytes
72. The reduction potentials of Cu^{2+}/Cu and Cd^{2+}/Cd are 0.34 and -0.40 V respectively. Then, the emf of the cell $\text{Cd}/\text{Cd}^{2+} \parallel \text{Cu}^{2+}/\text{Cu}$ is
 a. -0.06 V b. 0.06 V c. -0.74 V d. 0.74 V
73. In polarography method of analysis, the current measured is
 a. migration current b. limiting current c. eddy current d. diffusion current
74. Collision theory is applicable to
 a. only gaseous molecules b. only liquid c. only solid d. gas & liquid
75. Ostwalds dilution law holds good for a weak electrolytes is
 a. $K_c = \alpha/V$ b. $K_c = \alpha^2/V$ c. $K_c = \alpha/V^2$ d. none of these
76. The spherical electrode used in the polarography technique is
 a. DME b. calomel c. Pt d. supporting electrolyte
77. The hydrogen over voltage is maximum for
 a. Hg b. Pt c. glassy carbon d. Zn
78. Which one of the following high spin complexes has the largest CFSE value
 a. $[\text{Mn}(\text{H}_2\text{O})_6]^{2+}$ b. $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$ c. $[\text{Mn}(\text{H}_2\text{O})_6]^{3+}$ d. $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$
79. Jahn-Teller distortion is not observed in the high spin complexes of
 a. d^4 b. d^8 c. d^9 d. d^7
80. The expected spin only magnetic moments for $[\text{Fe}(\text{CN})_6]^{4-}$ and $[\text{Fe}(\text{I}^-)_6]^{3-}$ respectively are
 a. 0 & 5.92 BM b. 0 & 1.73 BM c. 1.73 & 5.92 BM d. 1.73 & 1.73 BM
81. Which of the following complexes have large CFSE value and ----has zero CFSE value?
 a. Oh & Zn b. Square planar & Ni^{2+} c. square planar & Zn d. Td & Pt
82. Selection rule for electronic spectra of complexes is
 a. $\Delta S=0; \Delta l = \pm 1$ b. $\Delta S=0; \Delta l = 0$ c. $\Delta S = \pm 1; \Delta l = 0$ d. $\Delta S \neq 0; \Delta l = +1$
83. The term symbol for Si atom is and the number of microstates for V^{3+} ions is
 a. 2P_0 & 45 b. $^2P_{1/2}$ & 120 c. 3P_0 & 45 d. $^2P_{3/2}$ & 10
84. From the following the complex which exhibits lowest energy electronic absorption band is and which one has absorption at shorter wavelength
 a. $\text{Ni}(\text{CO})_4$ & $[\text{Fe}(\text{CN})_6]^{4-}$ b. $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$ & $[\text{Fe}(\text{CN})_6]^{4-}$ c. $[\text{Fe}(\text{CN})_6]^{4-}$ & $\text{Ni}(\text{CO})_4$ d. a & b
85. Unlike d-d transitions, charge transfer bands are highly intense and rich in color and it is due to
 a. fully allowed transitions b. partially allowed c. spin forbidden and laporte allowed
 d. spin allowed and laporte forbidden
86. Which of the following ligands shows LMCT bands
 a. CN b. CO c. oxides & halides d. all of these
87. Which of the following carbonyl complexes exhibits highest stretching frequencies
 a. $\text{Ni}(\text{CO})_4$ b. $\text{Fe}(\text{CO})_5$ c. $\text{Mn}(\text{CO})_5$ d. $\text{Co}(\text{CO})_8$

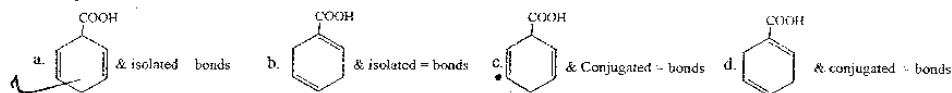
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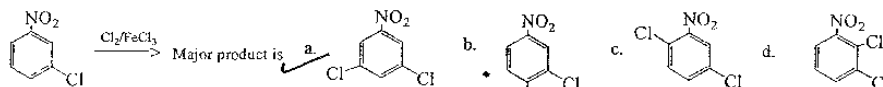
88. UV-Visible absorption bands of Hydrogen bonding present in a molecule shifts
 a. shorter wavelength b. longer wavelength c. unchanged d. cannot be predicted

89. The product of Birch reduction of benzoic acid isandare not reduced.



90. The rearrangement of aromatic α -diketones in the presence of base to give α -hydroxy acid is
 a. Pinacole-pinacolone b. Benzil-Benzilic c. Favorski d. Fries

91.



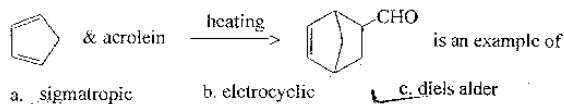
92. Fries rearrangement takes place in presence ofand gives

a. only ortho hydroxy ketone b. ortho and para-hydroxy ketone c. ortho-ester
 product d. ortho and para ester product

93. Strong deactivating group towards aromatic electrophilic substitution reaction is

a. -CHO b. CN c. -CCl₃ d. all of these

94.



95. Conversion of allylphenyl ether into ortho and para-allylphenyl alcohol is an example of
 a. Claisen rearrangement b. Fries rearrangement c. Cope rearrangement d. Diels-alder reaction

96. Para-bromo toluene reacts with $\text{NaNH}_2/\text{NH}_3$ mixture gives para-and meta-toluidine as the product, this mechanism is operated through

a. Benzyne mechanism b. $\text{S}_{\text{N}}\text{Ar}$ mechanism c. carbocation mechanism d. none

97. Aromatic compound from the following is

a. Tropylium cation b. azulene c. [14]-annulene d. all of these

98. The most reactive towards aromatic nitration reaction from the following is

a. Phenol b. toluene c. nitrobenzene d. bromobenzene

99. The method of preparation of an alkene from carbonyl compound is.....reaction

a. Stark-enamine b. Wittig c. Mannich d. Bayer-villiger

100. The frequency at which a proton will resonate in NMR spectrum is given by the equation

a. $\nu = 2H_0$ b. $\nu = \gamma H_0 / 2\pi$ c. $\nu = \gamma H_0 / 2\pi c$ d. $\nu = H_0 (1-\sigma) / 2\pi$

101. The finger print region in IR spectroscopy is.....and the IR frequency of symmetry and asymmetry stretching coincide with fundamental modes of different vibrations are called

a. 900-1400 cm^{-1} & overtones shift b. 900-1400 cm^{-1} & Fermi resonance c. below 900 cm^{-1} & Fermi resonance d. none of these

102. The number of signals appeared in the H-NMR spectrum of Iso-butylene and diethylether is

a. 2 & 2 b. 3 & 3 c. 4 & 4 d. 2 & 4

103. The molecules does not possess a permanent dipole moment will show raman spectra, due to

a. absorption is more b. absorption is less c. change in polarizability d. change in dielectric constant

104. The number of esr lines for $[\text{CF}_2\text{H}]^0$ and $[\text{CF}_2\text{D}]^0$ is

a. 6 & 9 b. 9 & 6 c. 6 & 6 d. 9 & 9

105. The shift of the resonance curve from zero velocity observed in the Mossbauer spectroscopy is called

a. Chemical Shift b. stokes shift c. isomer shift d. quadrupole shift

106. The number of NMR signals corresponds to Vinyl acetate and furfural is

a. 4 & 4 b. 3 & 3 c. 4&3 d. 3 & 4

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