CHEMISTRY

BOOKS - AIIMS PREVIOUS YEAR PAPERS

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Chemistry

1. Bohr's model of the structure of atom is not in conformity with

A. Heisenberg's uncertainty principle

B. Hund's rule of maximum multiplicity

C. Aulbau principle

D. Paulis exclusion principle

Answer: A

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2. The first ionization energy of hydrogen is 2.179×10^{-18} J The second ionization energy of helium atom will be

A. $8.716 \times 10^{-18} J$

B. $4.358 \times 10^{-18} J$

C. 5.45×10^{-17} J

D. $1.09 \times 10^{-18} J$

Answer: A

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3. The spectrum of He is expected to be similar to.

A. H

B. Li^+

C. He^+

D. Na

Answer: B

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4. Among the following species , the one that does not exist is

A. $[SiCl_6]^{2-}$

B. $[CCl_6]^{2-}$

C. $[GeCl_6]^{2-}$

D. $[SnCl_6]^{2-}$

Answer: B

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5. The conjugate acid of NH^{2-} is

A. N^{3-}

B. gt NH^{2-}

C. NH_3

D. NH_4^+

Answer: C

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6. Transition metals are often paramagnetic owing to the presence of

A. valency electrons in the outer two electrons shells

B. unpaired electrons in their atoms

C. vacant d orbitals in the n th orbit

D. electrons in d orbitals of the (n-1) orbit.

Answer: B

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7. High pressure and high temperature will be favourable conditions for a high equilibrium yield in the reaction

A.

$2Cl_2O_7(g) \rightarrow 2Cl_2(g) + 7O_2(g) + 126.8$ kcal

B.

$N_{2(g)} + 3H_{2(g)} \rightarrow 2NH_{3(g)} + 22.08kcal$

C. $Cl_{2(g)} + 2O_{2(g)} \rightarrow 2ClO_{2(g)}$ -49.4 kcal

D. $2NF_{3(g)} \rightarrow N_{2(g)} + 3F_{2(g)}$ - 54.4 kcal

Answer: C

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8. Among the oxy-acids of chlorine , the strongest oxidizing agent is

A. $HClO_4$

B. $HClO_3$

C. $HClO_2$

D. HClO

Answer: D

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9. When dry silver chloride is fused with sodium carbonate , silver is obtained as

A. free metal

B. Ag_2C_2

C. Ag_2O

D. Ag_2CO_3

Answer: A

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10. Which one of the following tetrachlorides does not undergo hydrolysis ?

A. $SnCl_4$

B. $GeCl_4$

C. $SiCl_4$

D. CCl_4

Answer: D

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11. The unit of dipole moment is

A. curie

B. debye

C. faraday

D. none of these

Answer: B

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12. Among the following acids , the one that can act as both an oxidizing agent and a reducing agent is

A. HNO_2

B. $HClO_4$

C. HNO_3

D. H_2SO_4

Answer: A

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13. The osmotic pressure of a dilute solution increases when

A. more of solute is added

B. more of solvent is added

C. temperature is increased

D. any one of the change is made

Answer: B

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14. Which of the following statement about boron halides is WRONG ?

A. They form tetrahedral molecules

B. They react with ethers to form addition compounds

C. They all hydrolyse in water

D. They are all strong Lewis acids

Answer: A

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15. The As_2S_3 colloid will be most readily coagulated by

A. $MgCl_2$

B. $AlCl_3$

C. Na_2SO_4

D. Na_3PO_4

Answer: B

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16. The [OH] in a solution is 1×10^{8} . The pH of the solution is

A. 10.0

B. 8.0

C. 6.0

D. 4.0

Answer: B

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17. Equal weights of methane and hydrogen are mixed in an empty container at $25^{\circ}C$. The fraction of the total pressure exerted by hydrogen is

A. 16/17

B. $1/9$

C. $8/9$

D. $1/2$

Answer: C

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18. Heat of neutralization of HCl by NaOH is 13.7 kcal per equivalent and by NH_4OH is 12.27 kcal. The heat of dissociation of NH_4OH is

A. -25.97 kcal

B. 25.97 kcal

C. -1.43 kcal

D. 1.43 kcal

Answer: D

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19. That the conventional representation of oxygen molecule $:\ddot{O}: \quad :\ddot{O}:$ Is wrong is suggested by the fact that

A. oxygen is a colourless gas

B. oxygen atoms join to form the triatomic ozone molecule

C. oxygen is paramagnetic

D. oxygen is highly reactive

Answer: C

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20. The alkane with the carbon chain $C - \overset{\overset{C}{|}}{\underset{\underset{C}{|}}{C}} - C$ could not be named

A. 2-methyl isobutane

B. neopentane

C. 2,2-dimethylpropane

D. tetramethyl methane

Answer: B

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21. Given the enthalpy of formation of $CO_2(g)$ is -94.0 KJ, of CaO(s) is -152 KJ, and the enthalpy of the reaction $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$ is 42KJ, the enthalpy of formation of $CaCO_3(s)$ is

A. -288 kJ

B. $+202$ kJ

C. -202 kJ

D. -42 kJ

Answer: A

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22. Acidic hydrogen is present in:

A. arenes

B. ethyne

C. ethene

D. ethane

Answer: B

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23. In the series of reactions

$CH_3COOH \xrightarrow[P_2O_5]{NH_3} A$

$A \xrightarrow{\text{Heat}} B \xrightarrow{P_2O_5} C$ the end product C is

A. CH_4

B. acetonitrile

C. CH_3OH

D. methyl cyanate

Answer: B

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24. Dry distillation of a mixture of the calcium salts of acetic acid and propionic acid will yield

A. methyl ethyl ketone

B. acetic acid

C. acetone

D. acetaldehyde

Answer: A

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25. Which of the following compounds does not dissolve in conc. H_2SO_4 even on warming ?

A. aniline

B. benzene

C. hexane

D. ethylene

Answer: C

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26. A nucleophilic reagent is

A. CO_2

B. BF_3

C. $dAlCl_3$

D. NH_3

Answer: D

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27. Lucas reagent is:

A. am. Cu_2Cl_2

B. conc. HCl + anhydrous $ZnCl_2$

C. $NaNO_2$+ dil HCl

D. acidified $KMnO_4$

Answer: A

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28. Natural rubber is vulcanized by heating it with

A. carbon disulphide

B. sulphur

C. carbon black

D. zinc oxide

Answer: B

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29. Cannizaro's reaction is given by

A. benzaldehyde

B. trimethylacetaldehyde

C. formaldehyde

D. all of the above

Answer: D

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30. The salt A forms a colourless solution . When $NaHCO_3$ was added to the aqueous solution of A_1 there was no change observed. However when the mixed solution was boiled. It becomes milky. The salt A contains the cation

A. Mg^{2+}

B. Ca^{2+}

C. either Ca^{2+} or Mg^{2+}

D. K^{+}

Answer: C

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31. The function of anhydous $AlCl_3$ in the Friedel Craft reaction is to

A. produce a nucleophile

B. produce an electrophile

C. absorb hydrogen chloride

D. absorb water

Answer: B

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32. The ultimate product of the hydrolysis of starch is

A. maltose

B. sucrose

C. fructose

D. glucose

Answer: D

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33. For testing nitrogen in organic compounds, they are fused with sodium metal, extracted with water, and treated with $FeSO_4$

soln. and acidified.The presence of nitrogen is indicated by a blue or green colour or precipitate . This test is not given by

A. urea

B. hdrazine

C. phenylhydrazine

D. anthranilic acid

Answer: B

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34. The use of NH_4Cl in the detection of third group radicals is to

A. decrease the solubility of the hydroxides of the group III cations

B. counter the activity of any interfering anions

C. prevent the precipitation of group IV cations as hydroxides

D. ensure complete precipitation of the third group cations.

Answer: C

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35. DDT is prepared by condensing chlorobenzene with

A. hexachloroethane

B. chloroform

C. chloral

D. methyl chloride

Answer: C

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36. The best indicator for titrating 0.1 Na_2CO_3 against 0.1 N HCl is

A. methyl red

B. litmus

C. phenolphthalein

D. universal indicator

Answer: A

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37. Given standard enthalpy of formation of $CO\left(-110\text{KJ mol}^{-1}\right)$ and $CO_2\left(-394\text{KJ mol}^{-1}\right)$. The heat of combustion when one mole of graphite burns is

A. -504 kJ

B. -394 kJ

C. -284 kJ

D. -110 kJ

Answer: B

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38. Aldehydes and ketones may be distinguished by using

A. saturated solution of $NaHSO_3$

B. 2:4 dinitrophenylhydrazine

C. Tollen's reagent

D. Baeyer's reagent

Answer: C

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39. Cyclisation of n-heptane will give

A. toluene

B. naphthalene

C. benzene

D. all the above

Answer: A

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40. A sample of chloroform before using as an anaesthetic is tested by :

A. Fehling solution

B. Ammonical Cu_2Cl_2 soln.

C. $AgNO_3$ soln.

D. $BaCl_2$ soln.

Answer: C

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41. The protons and neutrons in the nuclei of atoms undergo inter-conversions through the exchange of

A. electron or β-particle

B. charged mesons

C. photons

D. positrons

Answer: B

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42. 18 carat gold contains

A. 90

B. 75

C. 50

D. 25

Answer: B

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43. Liquid hydrogen is being seriously considered as automobile fuel. It is because liquid hydrogen

A. is an abundant and cheap fuel

B. is non-corrosive

C. is a pollution-free fuel

D. has a high calorific value

Answer: C

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44. One a.m.u. is equal to

A. 1.66×10^{-8} g

B. 1.66×10^{-4} g

C. 1.66×10^{-16} g

D. 1.66×10^{-24} g

Answer: D

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45. The normality of conc. HCl used in the laboratory is

A. 10 N

B. 8 N

C. 4 N

D. 2 N

Answer: A

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46. Which of the following will have least hindered rotation about carbon-carbon bond?

A. Ethyne

B. Ethene

C. Ethane

D. Hexachloroethane

Answer: C

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47. Units for the rate constant k of the zero order rate equation are

A. $L^2 mol^{-2} \sec^{-1}$

B. $L mol^{-1} \sec^{-1}$

C. $\sec^{-1}$

D. $molL^{-1}\sec^{1}$

Answer: D

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48. Proteins are characterized by the linkage

A. $-\underset{\underset{N}{|}}{\overset{|}{C}}-H-\overset{\overset{O}{||}}{\underset{||}{N}}$

B. $H-O-C\equiv N$

C. $-\underset{|}{\overset{\overset{N}{|}}{C}}-\overset{\overset{O}{||}}{\underset{||}{N}}-$

D. $-\overset{\overset{O}{||}}{C}-\overset{\overset{H}{|}}{N}-$

Answer: D

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49. Which compound does not dissolve in hot dil. HNO_3?

A. CdS

B. CuS

C. PbS

D. HgS

Answer: D

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50. Which of the following ions is not isoelectronic with the other three ?

A. CO_3^{2-}

B. NO_3^-

C. SO_3^{2-}

D. BO_3^{3-}

Answer: C

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51. Assertion: Both $12g.$ of carbon and $27g.$ of aluminium will have 6.02×10^{23} atoms.

Reason: Gram atomic mass of an element contains Avogadro's number of atoms.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation of Assertion

C. Assertion is true but Reason is false

D. Assertion is false but Reason is true

Answer: A

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52. Assertion:Sucrose is sweetest in taste

Reason : Sucrose is converted by the enzyme invertase present In living systems to glucose and fructose

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation of

Assertion

C. Assertion is true but Reason is false

D. Assertion is false but Reason is true

Answer: D

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53. Assertion (A): Potassium cannot be obtained by the electrolysis of used KCI in molten $CaCI_2$.

Reason (R): Metallic potassium is soluble in

molten $CaCI_2$. Thus, the cell for electrolysis gets short circuited.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation of Assertion

C. Assertion is true but Reason is false

D. Assertion is false but Reason is true

Answer: C

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54. Assertion: Electrons are ejected from a certain metal when either blue or violet light strikes the metal surface. However only violet light cause electron ejection from a second metal.

Reason: The electrons in the first metal requires less energy for ejection.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation of Assertion

C. Assertion is true but Reason is false

D. Assertion is false but Reason is true

Answer: A

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55. Assertion: Cyclobutane is less stable than cyclopentane

Reason : The bond angles in cyclobutane and cyclopentane are 90° and 108°, respectively

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation of

Assertion

C. Assertion is true but Reason is false

D. Assertion is false but Reason is true

Answer: A

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56. Assertion:Benzoyl chloride is used for the preparation of derivative of tertiary amines

Reason:It forms solid benzoyl derivatives

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation of Assertion

C. Assertion is true but Reason is false

D. Assertion is false but Reason is true

Answer: D

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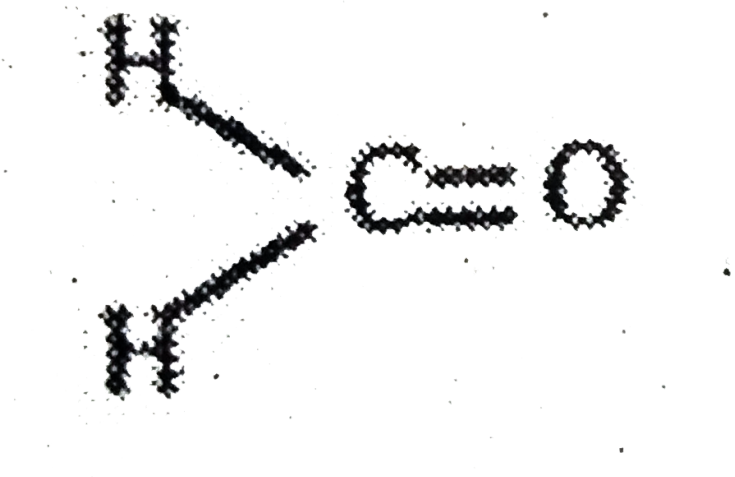
57. Assertion:In formaldehyde, all the four atoms are in the same plane



Reason:The carbon atom in formaldehyde is sp^3 hybridized

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation of Assertion

C. Assertion is true but Reason is false

D. Assertion is false but Reason is true

Answer: C

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58. Assertion (A) : A spectral line will be seen for $2p_x$-$2p_y$ transition

Reason (R) : Energy is raleased in the form of wave of light when the electron drops from $2p_x$, to $2p_y$ orbital.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation of Assertion

C. Assertion is true but Reason is false

D. Assertion is false but Reason is true

Answer: D

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59. Assertion: lt is very difficult to subject vinyl chloride to nucleophilic substitution as compared to ethyl chloride

Reason :The vinyl group is electron donating in viny chloride

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation of

Assertion

C. Assertion is true but Reason is false

D. Assertion is false but Reason is true

Answer: C

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60. Statement-I : The configuration of B atom cannot be $1s^2 2s^3$.

Because

Statement-II : Hund's rule demands that the

configuration should display maximum multiplicity.

A. Both Assertion and Reason are true and Reason is the correct explanation of Assertion

B. Both Assertion and Reason are true but Reason is not a correct explanation of Assertion

C. Assertion is true but Reason is false

D. Assertion is false but Reason is true

Answer: B

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