CHEMISTRY

BOOKS - KVPY PREVIOUS YEAR

MOCK TEST 6

Exercise

1. The value of the 'spin only magnetic moment for one of the following configuration is 2.84 BM. The correct one is

A. d^5 (in strong ligand field)

B. d^3 (in weak as well as in strong fields)

C. d^4 (in weak ligand fields)

D. d^4 (in strong ligand fields)

Answer:

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2. An ether (A),$C_5H_{12}O$,when heated with excess of hot concentrated HI produced two alkyl halides which when treated with NaOH yielded compounds(B) and (C). Oxidation of(B) and(C) gave a propanone and an ethanoic acid respectively. The IUPAC name of the ether (A) is:

A. 2-ethoxypropane

B. ethoxypropane

C. methoxybutane

D. 2-methoxybutane

Answer:

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3. Hydrogen peroxide in its reaction with KIO_4 and NH_2OH respectively, is acting as a

A. Reducing agent, oxidising agent

B. Reducing agent, reducing agent

C. Oxidising agent, oxidising agent

D. Oxidising agent,reducing agent

Answer:

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4. For the homogenous gaseous reaction $A \rightarrow 3B$, if pressure after time t was P_t and after completion of reaction, pressure was P_∞ then select correct relation

A. $k = \frac{1}{t}\ln\left(\frac{P_\infty}{3(P_\infty - P_t)}\right)$

B. $k = \frac{1}{t}\ln\left(\frac{2P_\infty}{(P_\infty - P_t)}\right)$

C. $k = \frac{1}{t}\ln\left(\frac{3P_\infty}{2P_\infty - P_t}\right)$

D. $k = \frac{1}{t}\ln\left(\frac{2P_\infty}{3(P_\infty - P_t)}\right)$

Answer:

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5. In O_2^-, O_2 and O_2^{-2} molecular species, the total number of antibonding electrons respectively are

A. 7,6,8

B. 1,0,2

C. 6,6,6

D. 8,6,8

Answer:

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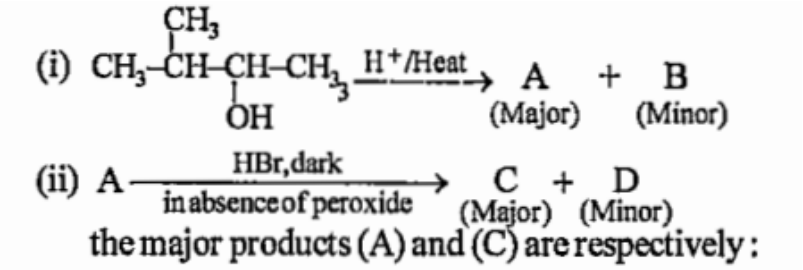
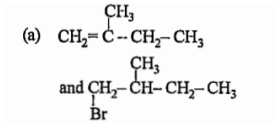
6. In the following reactions,



the major products (A) and (C) are respectively :

A.



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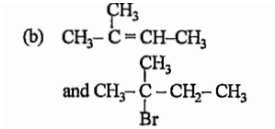
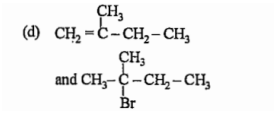


C.

D.



Answer:

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7. Potassium has a bcc structure with nearest neighour distance 4.52Åits atomic weight is 39 its density (in kg m^{-3}) will be

A. 454

B. 804

C. 852

D. 910

Answer:

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8. A 0.6gm sample consisting of only CaC_2O_4 and MgC_2O_4 is heated at $500^\circ C$gets converted into $CaCO_3$ and $MgCO_3$.

The sample then weighed 0.465gm. If the sample had been heated to $900^{\circ}C$ where the products are CaO and MgO, then what would the mixture of oxides weigh?

A. 0.12g

B. 0.21g

C. 0.252g

D. 0.3g

Answer:

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9. Formation of polyethylene from calcium carbide takes place as follows

$CaC_2 + 2H_2O \rightarrow Ca(OH)_2 + C_2H_2$

$C_2H_2 + H_2 \rightarrow C_2H_2$

$N(C_2H_4) \rightarrow (-CH_2 - CH_2 -)_n$

The amount of polyethylene obtained from $64.1 kg CaC_2$ is

A. 7kg

B. 14kg

C. 21kg

D. 28kg

Answer:

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10. Which of the following, when mixed, will give a solution with $pH > 7$?

A. $100mL0.1MHCl + 100mL0.1MKCl$

B. $100mL0.1MH_2SO_4 + 100mL0.1MNaOH$

C. $100mL0.1MCH_3COOH + 100mL0.1MKOH$

D. $50mL0.1MHCl + 50mL0.1MCH_3COONa$

Answer:

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11. Calculate the freezing point of a solution containing 8.1 g of HBr in 100g of water, assuming the acid to be 90% ionized. [Given : Molar mass Br = 80 g/mol, K_f water = 1.86 K kg/mol].

A. 0.85K

B. -3.53K

C. 0K

D. -0.38K

Answer:

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12. Consider the following reactions:

$MX_4 + X'_2 \rightarrow MX_4X_2'$

If atomic number of M is 52 and X and X' are halogens and X' is more electonegative than X. The choose correct statemetn regarding given information:

A. Both X' atoms occupy axial positions which are formed by overlapping of p and d-orbitals only

B. All M-X bond lengths are identical in both MX_4 and $MX_4X'_2$ compounds

C. Central atom 'M' does not use non-axial set of d-orbital in hybridization of final product.

D. Hybridization of central atom 'M' remains same in both reactant and final product.

Answer:

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13. A compound 'X' on ozonolysis followed by reduction gives an aldehyde, C_2H_4O and 2-butanone. Compound 'X' is:

A. 3-methylpentene-2

B. 3-methylpentene-3

C. 3-methylhexene-3

D. 3-ethylpentene-3

Answer:

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14. The correct order of magnetic moments (spin values in B.M.) among is:

A. $\left[Fe(CN)_6\right]^{4-} > [MnCl_4]^{2-} > [CoCl_4]^{2-}$

B. $[MnCl_4]^{2-} > \left[Fe(CN)_6\right]^{4-} > [CoCl_4]^{2-}$

C. $[MnCl_4]^{2-} > [CoCl_4]^{2-} > \left[Fe(CN)_6\right]^{4-}$

D. $\left[Fe(CN)_6\right]^{4-} > [CoCl_4]^{2-} > [MnCl_4]^{2-}$

Answer:

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15. The ammonia evolved from the treatment of 0.03 g of an organic compound for the estimation of nitrogen was passed in 100 mL of 0.1 M sulphuric acid. The axcess of the acid required 20 mL of 0,5 M solution hydroxide solution for complete neutralisation. the organic compound is :

A. urea

B. benzamide

C. acetamide

D. thiourea

Answer:

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16. In an electrolysis experiment, current was passed for $5h$ through two cells connected in series. The first cell contains a solution of gold and second contains copper sulphate solution. In the first cell, $9.85g$ of gold was deposited. If the oxidation number of gold is $+3$, find the amount of copper deposited at the cathode of the second cell. Also calculate the magnitude of the current in ampere, (Atomic weight of Au is 197 and atomic weight of Cu is 63.5).

A. 4.95 g,0.8A

B. 5.5g, 0.9A

C. 4.76 g, 0.8A

D. 5.85g, 0.5A

Answer:

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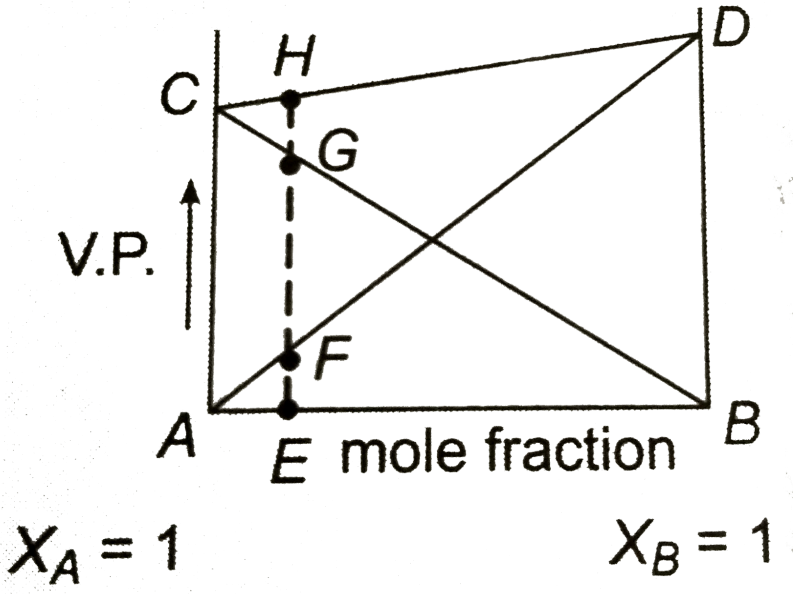
17. Based on the given diagram, which of the following statements regarding the homogenous solution of two volatile liquids are correct?



A. Only 1

B. 2 and 3

C. 1 and 3

D. All Statements are correct

Answer:

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18. The rate constant for the decomposition of a certain substance is $2.80 \times 10^{-1} M^{-1} s^{-1}$ at $30^{\circ} C$ and $1.38 \times 10^{-2} M^{-1} s^{-1}$ at $50^{\circ} C$. The Arrhenius parameters (A) of the reaction is:

$(R = 8.314 \times 10^{-3} kJ mol^{-1} K^{-1})$.

A. $8.68 \times 10^{8} M^{-1} s^{-1}$

B. $2.16 \times 10^{7} M^{-1} s^{-1}$

C. $4.34 \times 10^8 M^{-1} s^{-1}$

D. $3.34 \times 10^8 M^{-1} s^{-1}$

Answer:

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19. Which of the following combination will produce H_2 gas ?

A. Fe metal and cone. HNO_3

B. Cu metal and cone. HNO_3

C. Zn metal and NaOH(aq)

D. Au metal and NaCN(aq) in the presence of air

Answer:

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20. For the following molecules :

$PCl_5, BrF_3, ICl_2^-, XeF_5^-, NO_3^-, XeO_2F_2, PCl_4^+, CH_3^+$

Calculate the value of $\frac{a+b}{c}$

a = Number of species having sp^3 d-hybridisation

b= Number of species which are planar

c= Number of species which are non-planar

A. 2

B. 4

C. 3

D. 5

Answer:

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21. Which of the following expression is correct for packing fraction of NaCl if the ions along with face are diagonally removed?

A. $\frac{\frac{13}{3}\pi r_{-}^{3}+\frac{16}{3}\pi r_{+}^{3}}{8(r_{+}+r_{-})^{3}}$

B. $\frac{\frac{13}{3}\pi r_{-}^{3}+\frac{4}{3}\pi r_{+}^{3}}{8(r_{+}+r_{-})^{3}}$

C. $\frac{\frac{16}{3}\pi r_{-}^{3}+\frac{13}{3}\pi r_{+}^{3}}{8(r_{+}+r_{-})^{3}}$

D. $\frac{\frac{4}{3}\pi r_{-}^{3}+\frac{13}{3}\pi r_{+}^{3}}{8(r_{+}+r_{-})^{3}}$

Answer:

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22. Two metals X and Y form covalent halides.Both halides can act as Lewis acids and a catalyst in Friedel Crafts reaction. Halide of X is polymer in the solid state and a dimer in the vapour state which decomposes to monomer at 1200 K. However, halide of Y is a dimer in vapour state and becomes ionic in polar solvent. X and Y are respectively

A. Be,Al

B. Al,Be

C. Be,Ca

D. Mg,Ca

Answer:

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23. Among $[Ni(CO)_4], [NiCl_4]^{2-}, [Co(NH_3)_4Cl_2]Cl, Na_3[CoF_6], Na_2O_2$ and CsO_2, the total number of paramagnetic compounds is

A. 2

B. 3

C. 4

D. 5

Answer:

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24. A mixture of $CuSO_4.5H_2O$ and $MgSO_4.7H_2O$ was heated until all the water was driven-off. if 5.0 g of mixture

gave 3 g of anhydrous salts, what was the percentage by mass of $CuSO_4.5H_2O$ in the original mixture ?

A. 65.86

B. 70.86

C. 75.45

D. 79.25

Answer:

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25. For the reaction $Ag(CN)_2^{\ominus} \Leftrightarrow Ag^{\oplus} + 2CN^{\ominus}$, the K_c at $25^{\circ}C$ is 4×10^{-19} Calculate $\left[Ag^{\oplus}\right]$ in solution which was originally $0.1M$ in KCN and $0.03M$ in $AgNO_3$.

A. 75×10^{-13}

B. 75×10^{-12}

C. 7.5×10^{-12}

D. 7.5×10^{-13}

Answer:

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