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CHEMISTRY

BOOKS - KCET PREVIOUS YEAR PAPERS

KARNATAKA CET 2010

Chemistry

1. In the electrolytic refining of zinc.....

A. graphite is at the anode

B. the impure metal is at the cathode

C. the metal ion gets reduced at the anode

D. acidified zinc sulphate is the electrolyte

Answer: D

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2. The wave number of the spectral line in the emission spectrum of hydrogen will be equal to $\frac{8}{9}$ times the Rydberg's constant if electron jumps from

A. A) $n = 3$ to $n = 1$

B. B) $n = 10$ to $n = 1$

C. C) $n = 9$ to $n = 1$

D. D) $n = 2$ to $n = 1$

Answer: A

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3. Consider the following gaseous equilibria with equilibrium constants K_1 and K_2 respectively.

$$SO_{2(g)} + \frac{1}{2}O_{2(g)} \Leftrightarrow SO_{3(g)}$$

$$2SO_{3(g)} \Leftrightarrow 2SO_{2(g)} + O_{2(g)}$$

The equilibrium constants are related as .....

A. $K_1^2 = \frac{1}{K_2}$

B. $2K_1 = K_2^2$

C. $K_2 = \frac{2}{K_1^2}$

D. $K_2^2 = \frac{1}{K_1}$

Answer: A

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4. Enthalpy of vaporization of benzene is $+35.3kJmol^{-1}$ at its boiling point, $80^{\circ}C$. The entropy change in the transition of the vapour to liquid at its boilling point [in $JK^{-1}mol^{-1}$] is .....

A. -441

B. -100

C. $+441$

D. $+100$

Answer: B

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5. Which of the following conversions involves change in both hybridisation and shape ?

A. $CH_4 \rightarrow C_2H_6$

B. $NH_3 \rightarrow NH_4^+$

C. $BF_3 \rightarrow BF_4^-$

D. $H_2O \rightarrow H_3O^+$

Answer: C

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6. In chromite are , the oxidation number of iron and chromium respectively .....

A. $+3,\ +2$

B. $+3,\ +6$

C. $+2,\ +6$

D. $+2,\ +3$

Answer: C

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7. For the reversible reaction :

$$A_s + B_g \Leftrightarrow C_g + D_g : \Delta G^\circ = -350kJ$$

Which one of the following statements is true ?

A. The entropy change is negative.

B. Equilibrium constant is greater than one

C. The reaction should be instantaneous.

D. The reaction is thermodynamically not feasible.

Answer: B

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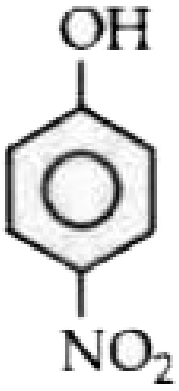
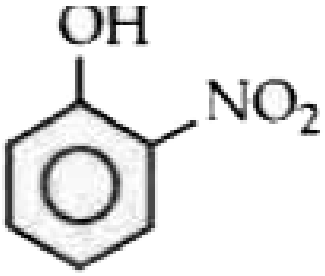
8. Out of the two compounds below the vapour pressure of (B) at a particular temperature is



(A)



(B)

A. higher than that of (A)

B. lower than that of (A)

C. higher or lower than (A), depending on the size if the vessel

D. same as that of (A)

Answer: A

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9. The amount of heat evolved when $500cm^3$ of 0.1 M HCl is mixed with $200cm^3$ of 0.2 M NaOH is .....

A. 2.292 kJ

B. 1.292 kJ

C. 0.292 kJ

D. 3.392 kJ

Answer: A

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10. During the adsorption of krypton on activated charcoal at low temperature .....

A. $\Delta H > 0$ and $\Delta S < 0$

B. $\Delta H < 0$ and $\Delta S < 0$

C. $\Delta H > 0$ and $\Delta S > 0$

D. $\Delta < 0$ and $\Delta S > 0$

Answer: B

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11. The set of quantum numbers for the outermost electron for copper in its fround state is

A. A) $4, 1, 1, +1/2$

B. B) $3, 2, 2, +1/2$

C. C) $4, 0, 0, +1/2$

D. D) $4, 2, 2, +1/2$

Answer: C

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12. Peroxide ion

(i) has five completely filled antibonding molecular

orbitals

(ii) is diamagnetic

(iii) has bond order one

(iv) is isoelectronic with neon.

Which one of these is correct ?

A. (iv) and (iii)

B. (i),(ii) and (iv)

C. (i), (ii) and (iii)

D. (i) and (iv)

Answer:

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13. Which one of these is NOT true for benzene ?

A. It forms only one type of monosubstituted product.

B. There are three carbon-carbon single bonds and three carbon-carbon double bonds.

C. The heat of hydrogenation of benzene is less than the theoretical value.

D. The bond angle between the carbon-carbon bonds is 120°

Answer: B

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14. A mixture of $CaCl_2$ and $NaCl$ weighing 4.44 g is treated with sodium carbonate solution to precipitate all the Ca^{+2} ions as calcium carbonate The calcium carbonate so obtained is heated strongly to get 0.56 g of CaO . The percentage of $NaCl$ in the mixture (atomic mass of $Ca = 40$) is

A. A) 75

B. B) 30.6

C. C) 25

D. D) 69.4

Answer: A

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15. For one mole of an ideal gas, increasing the temperature from $10^{\circ} C$ to $20^{\circ} C$

A. A) increases the average kinetic energy by two times.

B. B) increases the rms velocity by $\sqrt{2}$ times

C. C) increases the rms velocity by two times

D. D) increases both the average kinetic energy and rms velocity, but not significantly.

Answer: A

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16. Generally, the first ionization enthalpy increases along a period. But there are some exceptions. One which is NOT an expection is:

A. N and O

B. Na and Mg

C. Mg and Al

D. Be and B

Answer: B

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17. $50\ \mathrm{cm}^3$ of $0.2\ \mathrm{N\ HCl}$ is titrated against $0.1\ \mathrm{N\ NaOH}$ The remaining titration adding $50\ \mathrm{cm}^3$ of NaOH. The remaining titration is completed by adding 0.5 N KOH The volume of KOH required for completing the titration is

A. A) $12\ \mathrm{cm}^3$

B. B) $10\ \mathrm{cm}^3$

C. C) $25\ \mathrm{cm}^3$

D. D) $10.5\ \mathrm{cm}^3$

Answer: B

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18. In which one of the following, does the given amount of chlorine exert the least pressure in a vessel of capacity $1 \ \ \mathrm{cm}^3$ at 273 K ?

A. 0.0355 g

B. $0.071g$

C. 6.023×10^{21} molecules

D. 0.02 mole

Answer: A

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19. Based on the first law of thermodynamics, which one of the following is correct ?

A. For an isochoric process $= \Delta u = -q$

B. For an isochoric process $= \Delta u = -w$

C. For an isothermal process $= q = +w$

D. For a cyclic process : $q = -w$

Answer: D

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20. For alkali metals, which one of the following trends is incorrect ?

A. Hydration energy : $Li > Na > K > RB$

B. Ionization energy : $Li > Na > K > Rb$

C. Density : $Li < Na < K < Rb$

D. Atomic size : $Li < Na < K < Rb$

Answer: C

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21. One gram of silver gets distributed between $10\,\mathrm{cm}^3$ of molten zinc and $100\,\mathrm{cm}^3$ of molten lead of $800^\circ C$. The percentage of silver in the zinc layer is approximately

A. 89

B. 91

C. 97

D. 94

Answer: C

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22. One mole of an organic compound A with the formula C_3H_8O reacts completely with two moles of HI to from X and Y. When Y is boiled with aqueous alkali it forms Z.Z answers the iodoform test. The compound A is

A. A) propan-2-ol

B. B) propane-1-ol

C. C) ethoxyethane

D. D) methoxyethane

Answer: D

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23. The IUPAC name of $K_2\left[Ni(CN)_4\right]$ is :

A. potassium tetracyanonickelate(II)

B. potassium tetracyanatonickelate(III)

C. potassium tetracyanatonickel(II)

D. potassium tetracyanonickel(III)

Answer: A

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24. The spin only magnetic moment of Mn^{4+} ion is nearly

A. 3 BM

B. 6 BM

C. 4 BM

D. 5 BM

Answer: C

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25. In Kjeldahl's method, ammonia from $5g$ of food neutralizes $30cm^3$ of $0.1N$ acid. The percentage of nitrogen in the food is

A. 0.84

B. 8.4

C. 16.8

D. 1.68`

Answer: A

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26. Carbon can reduce ferric oxide to iron at a temperature above 983 K because

A. carbon monoxide formed is thermodynamically less satble than ferric oxide

B. carbon has a higher affinity towards oxidation than iron.

C. free energy change for the formation of carbon dioxide is less negative than that for ferric oxide.

D. iron has a higher affinity towards oxygen than carbon.

Answer: B

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27. An oxygen containing organic compound upon oxidation forms a carboxylic acid as the only organic product with its molecular mass higher by 14 units. The organic compound is

A. an aldehyde

B. a primary alcohol

C. a secondary alcohol

D. a ketone

Answer: B

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28. The compound obtained when acetaldehyde reacts with dilute aqueous sodium hudroxide exhibits

A. geometrical isomerism

B. optical isomerism

C. neither optical nor geometrical isomerism

D. both optical and geometrical isomerism

Answer: B

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29. The activation energy for a reaction at the temperature T K was found to be 2.303 RT J mol^{-1} . The ratio of the rate constant to Arrhenius factor is :

A. 10^{-1}

B. 10^{-2}

C. 2×10^{-3}

D. 2×10^{-2}

Answer: A

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30. A dibromo derivative of an alkane reacts with sodium metal to form an alicyclic hydrocarbon. The derivative is

A. 1,1-dibromopropane

B. 2,2-dibromobutane

C. 1,2-dibromoethane

D. 1,4-dibromobutane

Answer: D

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31. The time required for 100% completion of a zero order reaction is

A. $\frac{2k}{a}$

B. $\frac{a}{2k}$

C. $\frac{a}{k}$

D. ak

Answer: C

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32. 0.023g of sodium metal is reacted with $100cm^3$ of water. The pH of the resulting solution is :

A. 10

B. 11

C. 9

D. 12

Answer: D

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33. Which one of the following is wrongly matched?

A. $\left[Cu(NH_3)_4\right]^{2+}$ - square planer

B. $\left[Ni(CO)_4\right]$ - neutral ligand

C. $\left[Fe(CN)_6\right]^{3-} - sp^2d^2$

D. $\left[Co(en)_3\right]^{+}$ - follows EAN rule

Answer: C

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34. Which of the following is most energetic conformation of cyclohexane?

A. Half - chair

B. Boat

C. Twisted-boat

D. Chair

Answer: A

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35. Which one of the following is a molecular crystal?

A. Rock salt

B. Quartz

C. Dry ice

D. Diamond

Answer: C

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36. A buffer solution contains 0.1 mole of sodium acetate dissolved in $1000cm^3$ of 0.1 M acetic acid. To the above

buffer solution, 0.1 mole of sodium acetate is further added and dissolved. The pH of the resulting buffer is

A. $pK_a - \log 2$

B. pK_a

C. $pK_a + 2$

D. $pK_a + \log 2$

Answer: D

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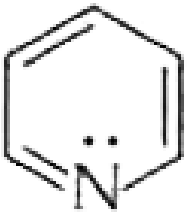
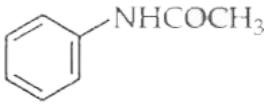
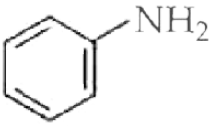
37. Which one of the following has the most nucleophilic nitrogen ?

A. 

B. 

C. 

D. 

Answer: A

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38. Chloroacetic acid is a stronger acid than acetic acid. This can be explained using

A. $-M$ effect

B. $-I$ effect

C. $+M$ effect

D. $+I$ effect

Answer: B

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39. The correct sequence of reaction to convert p-nitrophenol into quinol involves

A. A) reduction, diazotization and hydrolysis

B. B) hydrolysis, diazotization and reduction

C. C) hydrolysis, reduction and diazotization

D. D) diazotization, reduction and hydrolysis.

Answer: A

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40.

$$CH_3CH_2Br \xrightarrow[\Delta]{\text{aq. KOH}} A \xrightarrow[\Delta]{KMnO_4/H^+} B \xrightarrow[\Delta]{NH_3} C \xrightarrow[\text{alkali}]{Br_2} D, ''D''$$

is :

A. CH_3Br

B. CH_3CONH_2

C. CH_3NH_2

D. $CHBr_3$

Answer: C

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41. The letter 'D' in D-glucose signifies :

A. configuration at chiral carbons

B. dextrorotatory

C. that it is a monosaccharide

D. configuration at particular chiral carbon

Answer: D

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42. Reaction of methyl bromide with aqueous sodium hydroxide involves

A. recemisation

B. S_N1 mechanism

C. inversion of configuration

D. S_N2 mechanism

Answer: C::D

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43. $9.65C$ of electric current is passed through fused anhydrous magnesium chloride. The magnesium metal thus, obtained is completely converted into a Grignard reagent. The number of moles of the Grignard reagent obtained is

A. 5×10^{-4}

B. 1×10^{-4}

C. 5×10^{-5}

D. 1×10^{-5}

Answer: C

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44. Which one of the following does NOT involve coagulation ?

A. Formation of delta regions

B. Peptization

C. Treatment of drinking water by potash alum

D. Clotting of blood by the use of ferric chloride

Answer: B

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45. In alkaline medium, alanine exists predominantly as

A. anion

B. zwitter ion

C. cation

D. covalent form

Answer: B

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46. The standard emf of galvanic cell involving 3 moles of electrons in its redos reaction is 0.59V. The equilibrium constant for the reaction of the cell is

A. 10^{25}

B. 10^{20}

C. 10^{15}

D. 10^{30}

Answer: D

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47. Benzaldehyde and acetone can best distinguished using

A. Fehling's solution

B. sodium hydroxide solution

C. 2,4-DNP

D. Tollen's reagent

Answer: D

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48. Which one of the following statements is true

A. Saponification of oil yields a diol.

B. Drying of oil involves hydrolysis

C. Addetion of antioxidant to oil minimizes rancidity.

D. Refining of oil involves hydrogenbation.

Answer: C

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49. The following data is obtained during the first order thermal decomposition of

$2A_{(g)} \rightarrow B_{(g)} + C_{(s)}$

at constant volume and temperature.

$$2A_{(g)} \longrightarrow B_{(g)} + C_{(s)}$$

at constant volume and temperature.

S. No.	Time	Total pressure in Pascal
1.	At the end of 10 minutes	300
2.	After completion	200

The rate constant in $\left| \min^{-1} \right.$ is

A. A) 0.0693

B. B) 6.93

C. C) 0.00693

D. D) 69.3

Answer: A

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50. Phenol $\xrightarrow{X}$ forms a tribromo derivation. "X" is

A. bromine in benzene

B. bromine in water

C. potassium bromide solution

D. bromine in carbon tetrachloride at $0^{\circ}C$.

Answer: B

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51. The correct sequence of steps involved in the mechanism of Cannizzaro's reaction is

A. nucleophilic attack, transfer of H^- and transfer of H^+

B. transfer of H^-, transfer of H^+ and nucleophillic attack.

C. transfer of H^+, nucleophilic attack and transfer of H^-

D. electrophilic attack by OH^- transfer of H^+ and transfer of H^-

Answer: A

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52. Which one of the following is an example for homogeneous catalysis ?

A. Manufacture of sulphuric acid by contact process

B. Manufacture of ammonia by Haber's process

C. Hydrolysis of sucrose in presence of dilute hydrochloric acid

D. Hydrogenation of oil

Answer: C

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53. The empirical formula of a non - electrolyte is CH_2O. A solution containing 6 g of the compound exerts the same osmotic pressure as that 0.05 M glucose solution at the same temperature. **The molecular formula of the compound is**

A. $C_2H_4O_2$

B. $C_3H_6O_3$

C. $C_5H_{10}O_5$

D. $C_4H_8O_4$

Answer: D

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54. A white crtystalline salt A reacts with dilute HCl to liberate a suffocating gas B and also forms a yellow precipitate. The gas B turns potassium dichromate acidified with dilute H_2SO_4 to a green coloured solution C.A,B and C are respectively

A. $Na_2SO_3, SO_2, Cr_2(SO_4)_3$

B. $Na_2S_2O_3, SO_2, Cr_2(SO_4)_3$

C. $Na_2S, SO_2, Cr_2(SO_4)_3$

D. $Na_2SO_4, SO_2, Cr_2(SO_4)_3$

Answer: B

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55. Molecules of a noble gas do not possess vibrational energy because a noble gas

A. is monoatomic

B. is chemically inert

C. has completely filled shells

D. is diamagnetic

Answer: A

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56. One dm^3 solution containing 10^{-5} moles each of Cl^- ions and CrO_4^{2-} ions is treated with 10^{-4} moles of silver nitrate. Which one of the following observations is made ?

$\left[K_{sp}Ag_2CrO_4 = 4 \times 10^{-12}\right]$

$\left[K_{sp}AgCl = 1 \times 10^{-10}\right]$

A. Precipitation does not occur.

B. Silver chromate gets precipitated first

C. silver chloride gets precipitated first.

D. Both silver chromate and silver chloride start precipitating simultaneously.

Answer: C

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57. pH value of which one of the following is NOT equal to one ?

A. $0.1 \quad \mathrm{M}\, \mathrm{HNO}_3$

B. $0.05 \quad \mathrm{M} \quad H_2SO_4$

C. $0.1 \quad \mathrm{M} \quad CH_3COOH$

D. $50 \quad \mathrm{cm}^3$ of 0.4 M HCl + 50 cm^3 of $0.2 \quad \mathrm{M}\, \mathrm{NaOH}$

Answer: C

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58. E_1, E_2 and E_3 are the emf values of the three galvanic cells respectively.

(i) $Zn\left|Zn^{2+}_{1M}\right|\left|Cu^{2+}_{0.1M}\right|Cu$

(ii) $Zn\left|Zn^{2+}_{1M}\right|\left|Cu^{2+}_{1M}\right|Cu$

(iii) $Zn\left|Zn^{2+}_{0.1M}\right|\left|Cu^{2+}_{1M}\right|Cu$

Which one of the following is true ?

A. $E_2 > E_3 > E_1$

B. $E_3 > E_2 > E_1$

C. $E_1 > E_2 > E_3$

D. $E_1 > E_3 > E_2$

Answer: B

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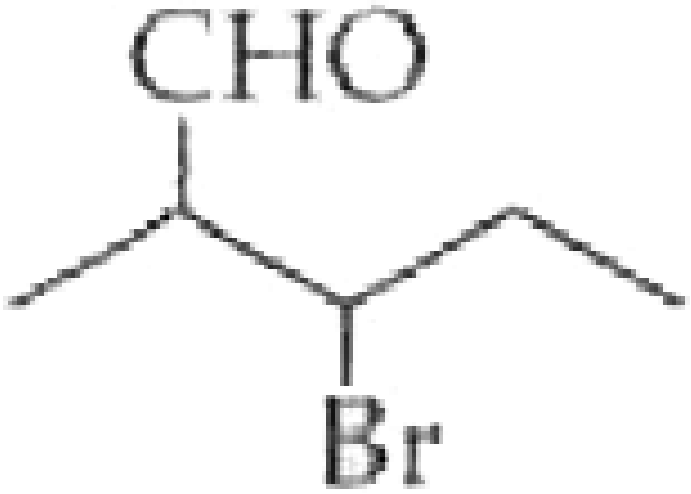
59. The IUPAC name of



is

A. 2-methyl-3-bromohexanal

B. 3-bromo-2-methylbutanal

C. 2-methyl-3-bromobutanal

D. 3-bromo-2methylpentanal

Answer: D

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60. Which one of the following forms propane nitrile as the major product?

A. Ethyl bromide + alcoholic KCN

B. Propyl bromide + alcoholic KCN

C. Propyl bromide + alcoholic AgCN

D. Ethyl bromide + alcoholic AgCN

Answer: A

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