



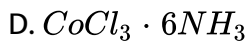
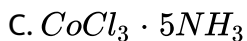
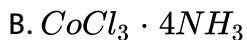
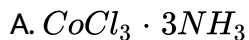
CHEMISTRY

BOOKS - MHTCET PREVIOUS YEAR PAPERS AND PRACTICE PAPERS

MHTCET 2014

Chemistry

1. Which of the following complexes has lowest molar conductance ?



Answer: A



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2. The volume of oxygen evolved at STP by decomposition of 0.68g '20 volume' hydrogen peroxide solution is

A. 2.24 mL

B. 22.4 mL

C. 224 mL

D. 2240 mL

Answer: C



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3. What is the molality of solution containing 200 mg of urea (molar mass 60 g mol^{-1}) dissolved in 40 g of water ?

A. 0.0825

B. 0.825

C. 0.498

D. 0.0013

Answer: A



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4. Alkaline hydrolysis of which among the following compounds leads to the formation of a racemate ?

A. 1-bromo-1- phenylethane

B. 1-chloro-3-methylbutane

C. Bromoethane

D. 1-chloropropane

Answer: A



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5. The work done when two mole of an ideal gas is compressed from a volume of $5m^3$ to $1dm^3$ at 300 K , under a pressure of 100 kPa is

- A. 499.9 kj
- B. – 499.9kj
- C. – 99.5 kj
- D. 42495kj

Answer: A



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6. Which among the following group 16 elements exists in more than two allotropic states ?

- A. Polonium
- B. Tellurium

C. Selenium

D. Oxygen

Answer: C



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7. Solubility of which among the following substances in water increases slightly with rise in temperature ?

A. Potassium bromide

B. Potassium chloride

C. Potassium nitrate

D. Sodium nitrate

Answer: B



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8. Assuming enthalpy of combustion of hydrogen at 273 K is -286 kJ and enthalpy of fusion of ice at the same temperature to be $+6.0 \text{ kJ}$, calculate enthalpy change during formation of 100 g of ice

A. $+1622 \text{ kJ}$

B. -1622 kJ

C. $+292 \text{ kJ}$

D. -292 kJ

Answer: B



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9. How is electrical conductance of a conductor related with length and area of cross section of the conductor ?

A. $G = I. a. k^{-1}$

B. $G = k. I. a^{-1}$

$$C. G = k. a. I^{-1}$$

$$D. G = k. I. a^{-2}$$

Answer: C



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10. What is the orbital angular momentum of an electron in 'f' orbital ?

A. $\frac{1.5h}{\pi}$

B. $\frac{\sqrt{6}h}{\pi}$

C. $\frac{\sqrt{3}h}{\pi}$

D. $\frac{\sqrt{3}h}{2\pi}$

Answer: C



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11. Which statement is not correct about fullerene C_{60} ?

- A. It contains 20 six membered rings and 12 five membered rings
- B. All carbon atoms undergo sp^2 hybridisation
- C. A six membered ring is fused with six membered rings only
- D. A five membered ring is fused with six membered ring only

Answer: C



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12. The product of molar concentration of hydrogen ions and hydroxide ions in a 0.01 M aqueous solution of sodium chloride is known as

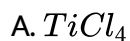
- A. hydrolysis constant of salt
- B. dissociation constant of acid
- C. dissociation constant of base
- D. ionic product of water

Answer: D

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13. Select the coloured compound amongst the following (atomic no

$Ti = 22, Cr = 24, Cu = 29, Zn = 30$)



Answer: B

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14. Which among the following solids crystallises face centred cube ?

A. Iron

B. Rubidium

C. Uranium

D. Platinum

Answer: A



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15. What is the pH of millimolar solution of ammonium hydroxide which is 20% dissociated ?

A. 3.699

B. 10.301

C. 4.691

D. 9.301

Answer: B

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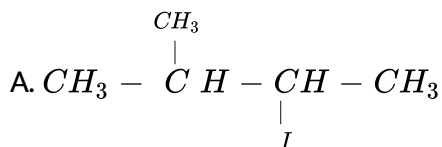
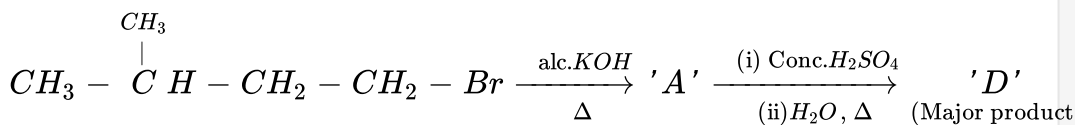
16. What is the geometry of molecule of bromine penta fluoride ?

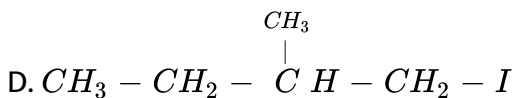
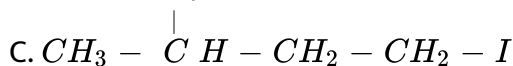
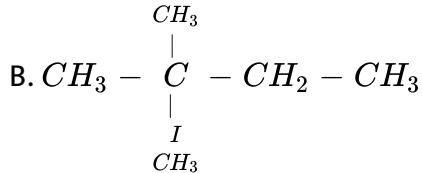
- A. Square planar
- B. Trigonal bipyramidal
- C. Square pyramidal
- D. Octahedral

Answer: C

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17. Identify the compound 'D' in the following series of reactions .





Answer: C

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18. Write IUPAC name of following compound



A. 2-amino- 4- hydroxybenzoic acid

B. 6-amino-4-hydroxybenzoic acid

C. 3-amino-4-carboxyphenol

D. 2-carboxy-4-hydroxyaniline

Answer: A



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19. Which among the following metals is employed to provide cathodic protection to iron ?

A. Zinc

B. Nickel

C. Tin

D. Lead

Answer: A



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20. In which of the following oxides of nitrogen, the oxidation state of the element is the lowest ?

A. Nitric oxide

B. Nitrous oxide

C. Nitrogen dioxide

D. Nitrogen trioxide

Answer: B

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21. Select the ether among following that yields methanol as one of the products on reaction with cold hydroiodic acid

A. 1-methoxybutane

B. 1-methoxybutane-2-methylpropane

C. 2-methoxy-2-methylpropane

D. methoxybenzene

Answer: C

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22. Rate law for the reaction $A + B \rightarrow \text{product}$ is $\text{rate} = k[A]^2[B]$. What is the rate constant, if rate of reaction at a given temperature is 0.22 M s^{-1} , when $[A] = 1 \text{ M}$ and $[B] = 0.25 \text{ M}$?

A. $3.52 \text{ M}^{-2} \text{ s}^{-1}$

B. $0.88 \text{ M}^{-2} \text{ s}^{-1}$

C. $1.136 \text{ M}^{-2} \text{ s}^{-1}$

D. $0.05 \text{ M}^{-2} \text{ s}^{-1}$

Answer: B



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23. Presence of nitrogen in which among the following compounds can not be detected by Lassaigne method?

A. Hydrazine

B. Aniline

C. p-toluidine

D. Picric acid

Answer: A



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24. 20 mL solution of 0.1 M ferrous sulphate was completely oxidised using a suitable oxidising agent what is the number of electronic exchanged ?

A. 1.204×10^{22}

B. 193

C. 1930

D. 1.204×10^{21}

Answer: D



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25. Among the following select the alkane that is expected to have lowest boiling point

- A. hexane
- B. 2-methylpentane
- C. 3-methylpentane
- D. 2,2-dimethylbutane

Answer: D



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26. 

Identify the compound 'D' in above mentioned series of reactions .

A. 

B. 

C. 

D. 

Answer: B

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27. Which among the following gases can be liquified easily ?

A. Chlorine

B. Nitrogen

C. Oxygen

D. Hydrogen

Answer: A

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28. What is the mass of one molecule of yellow phosphorus ? (Atomic mass , P = 30)

A. 1.993×10^{-22} kg

B. 1.993×10^{-19} mg

C. 4.983×10^{-20} mg

D. 4.983×10^{-23} kg

Answer: B



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29. Ozone is present as a chief constituent in which region of the atmosphere ?

A. Troposphere

B. Stratosphere

C. Mesosphere

D. Thermosphere

Answer: B



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30. The plot of square root of frequency of X-ray emitted against atomic number led to suggestion of which law/rule?

A. Periodic law

B. Modern periodic law

C. Hund's rule

D. Newland's law

Answer: B



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31. The compound that yields only ketonic compounds on ozonolysis is

A. but-2-ene

B. pent -2 ene

C. 2,3 -dimethylbut-2-ene

D. 2-methylbut-2-ene

Answer: C



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32. Metals are refined by using different methods. Which of the following metals are refined by electrolytic refining?

A. Aluminium

B. Bismuth

C. Tin

D. Lead

Answer: A

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33. The two monomers used in the preparation of dextran are

A. 3-hydroxy butanoic acid and 3-hydroxy pentanoic acid

B. ϵ - amion caproic acid and glycine

C. isobutylene and isoprene

D. lactic acid and glycolic acid

Answer: D

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34. Which oxyacid of sulphur contains S-S single bond?

A. Oleum

B. Marshall's acid

C. Dithionic acid

D. Thiosulphuric acid

Answer: C



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35. Amongst the following select the element having highest ionization enthalpy.

A. Sodium

B. Potassium

C. Beryllium

D. Magnesium

Answer: C



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36. Identify the alkene that is produced in the following series of reactions



A.

B.

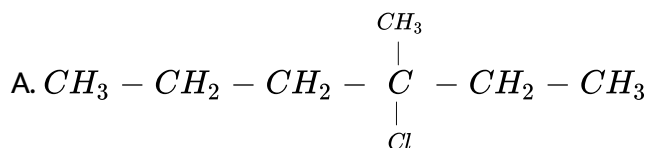
C.

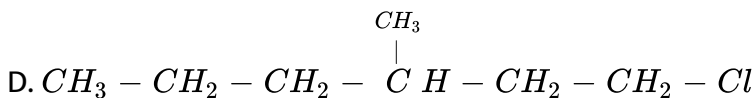
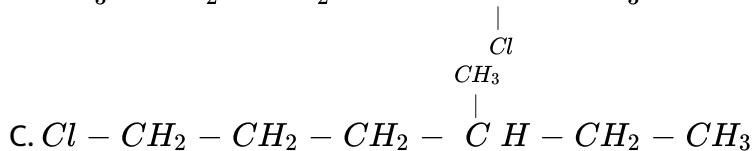
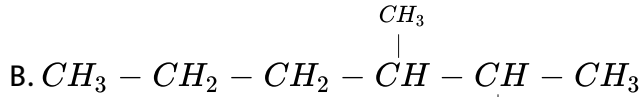
D.

Answer: A

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37. 'X' is an optically active alkane having lowest molecular mass, Predict the structure of the major product obtained on monochlorination of 'X'.





Answer: A

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38. Butylated hydroxy toluene is used in

- A. preventing oxidative rancidity of fats
- B. preserving food grains
- C. killing bacteria living tissues
- D. reducing stress and anxiety

Answer: A

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39. Deficiency of which vitamin causes degeneration of spinal cord ?

A. E

B. K

C. B_{12}

D. A five membered ring is fused with six membered ring only

Answer: C



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40. Bond order of which among the following molecules is zero ?

A. F_2

B. O_2

C. Be_2

D. Li_2

Answer: C

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41. Benzene can be conveniently converted into n-propyl benzene by

A. Friedel-Craft alkylation with n-propyl chloride

B. Friedel-Craft acylation with propionyl chloride followed by Wolff-Kishner reduction

C. Friedel-Craft acylation with propionyl chloride followed by catalytic hydrogenation

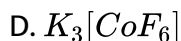
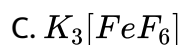
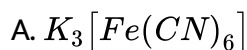
D. Friedel-Craft acylation with propionyl chloride followed by reduction with $LiAlH_4$

Answer: B

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42. Select the diamagnetic complex ion amongst the following complexes

(At.no : Fe = 26 , CO = 27)



Answer: B



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43. One mole of stachyose on hydrolysis yields

A. 1 mole of glucose + 1 mole of fructose + 2 mole of galactose

B. 2 mole of glucose + 1 mole of fructose + 1 mole of galactose

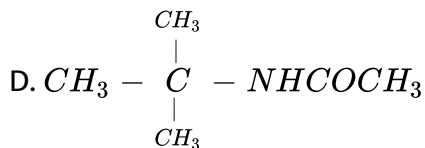
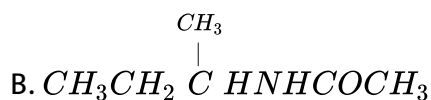
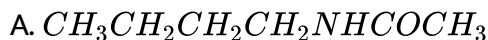
C. 1 mole of glucose + 2 mole of fructose + 1 mole of galactose

D. 2 mole of glucose + 2 mole of fructose

Answer: A

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44. An organic compound X having molecular formula $C_3H_{11}N$ reacts with p-toluene sulphonyl chloride to form a compound Y that is soluble in aqueous KOH. Compound X is optically active and reacts with acetyl chloride to form compound Z. Identify the compound Z



Answer: B





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45. If average velocity of a sample of gas molecules at 300 K is 5cm.s^{-1} , what is RMS velocity of same sample of gas molecules at the same temperature ? (Given, $\alpha : u : v = 1 : 1.224 : 1.127$)

- A. 6.112 cm/s
- B. 4.605 cm/s
- C. 4.085 cm/s
- D. 5.430 cm/s

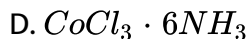
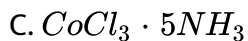
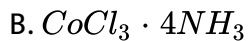
Answer: D



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46. Which of the following complexes has lowest molar conductance ?

- A. $\text{CoCl}_3 \cdot 3\text{NH}_3$



Answer: A

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47. The volume of oxygen evolved at STP by decomposition of 0.68 g '20 volume' hydrogen peroxide solution is

A. 2.24 mL

B. 22.4 mL

C. 224 mL

D. 2240 mL

Answer: C

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48. What is the molality of a solution containing 200 mg of urea (molar mass 60 g mol^{-1}) dissolved in 40 g of water ?

A. 0.0825

B. 0.825

C. 0.498

D. 0.0013

Answer: A



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49. Alkaline hydrolysis of which among the following compounds leads to the formation of a racemate ?

A. 1-bromo-1- phenylethane

B. 1-chloro-3-methylbutane

C. Bromoethane

D. 1-chloropropane

Answer: A

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50. The work done when two mole of an ideal gas is compressed form a volume of $5m^3$ to $1dm^3$ at 300 K , under a pressure of 100 kPa is

A. 499.9 kj

B. – 499.9kj

C. – 99.5 kj

D. 42495kj

Answer: A

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51. Which among the following group 16 elements exists in more than two allotropic states ?

A. Polonium

B. Tellurium

C. Selenium

D. Oxygen

Answer: C



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52. Solubility of which among the following substances in water increases slightly with rise in temperature ?

A. Potassium bromide

B. Potassium chloride

C. Potassium nitrate

D. Sodium nitrate

Answer: B

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53. Assuming enthalpy of combustion of hydrogen at 273 K is -286 kJ and enthalpy of fusion of ice at the same temperature to be $+6.0$ kJ , calculate enthalpy change during formation of 100 g of ice

A. $+1622$ kJ

B. -1622 kJ

C. $+292$ kJ

D. -292 kJ

Answer: B

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54. How is electrical conductance of a conductor related with length and area of cross section of the conductor ?

A. $G = I. a. k^{-1}$

B. $G = k. I. a^{-1}$

C. $G = k. a. I^{-1}$

D. $G = k. I. a^{-2}$

Answer: C



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55. What is the orbital angular momentum of an electron in 'f' orbital ?

A. $\frac{1.5h}{\pi}$

B. $\frac{\sqrt{6}h}{\pi}$

C. $\frac{\sqrt{3}h}{\pi}$

D. $\frac{\sqrt{3}h}{2\pi}$

Answer: C



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56. Which statement is not correct about fullerene C_{60} ?

- A. It contains 20 six membered rings and 12 five membered rings
- B. All carbon atoms undergo sp^2 hybridisation
- C. A six membered ring is fused with six membered rings only
- D. A five membered ring is fused with six membered ring only

Answer: C



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57. The product of molar concentration of hydrogen ions and hydroxide ions in a 0.01 M aqueous solution of sodium chloride is known as

- A. hydrolysis constant of salt
- B. dissociation constant of acid
- C. dissociation constant of base
- D. ionic product of water

Answer: D

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58. Select the coloured compound amongst the following

(At.no . Ti = 22 , Cr = 24 , Cu = 29 , Zn = 30)

- A. $TiCl_4$
- B. $CrCl_3$
- C. $ZnCl_3$
- D. $CuCl$

Answer: B

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59. Which among the following solids crystallises as a face centred cube ?

- A. Iron
- B. Rubidium
- C. Uranium
- D. Platinum

Answer: A

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60. What is the pH of millimolar solution of ammonium hydroxide which is 20% dissociated ?

- A. 3.699
- B. 10.301

C. 4.691

D. 9.301

Answer: B



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61. What is the geometry of molecule of bromine penta fluoride ?

A. Square planar

B. Trigonal bipyramidal

C. Square pyramidal

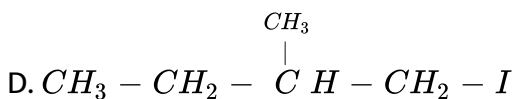
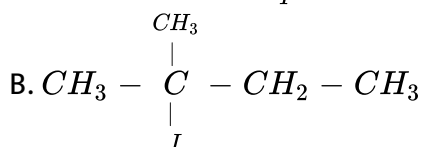
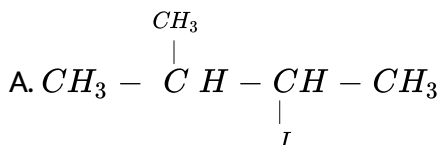
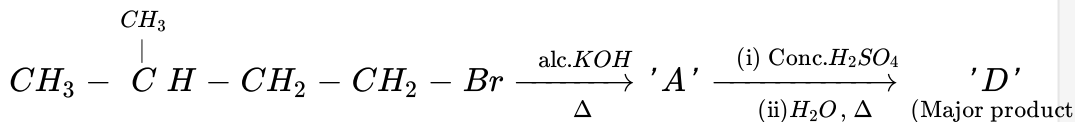
D. Octahedral

Answer: C



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62. Identify the compound 'D' in the following series of reactions .



Answer: C

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63. Write IUPAC name of following compound



A. 2-amino- 4- hydroxybenzoic acid

B. 6-amino-4-hydroxybenzoic acid

C. 3-amino-4-carboxyphenol

D. 2-carboxy-4-hydroxyaniline

Answer: A



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64. Which among the following metals is employed to provide cathodic protection to iron ?

A. Zinc

B. Nickel

C. Tin

D. Lead

Answer: A



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65. Oxidation number of nitrogen in which among the oxide of nitrogen is the lowest ?

- A. Nitric oxide
- B. Nitrous oxide
- C. Nitrogen dioxide
- D. Nitrogen trioxide

Answer: B

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66. Select the ether among following that yields methanol as one of the products on reaction with cold hydroiodic acid

- A. 1-methoxybutane
- B. 1-methoxybutane-2-methylpropane

C. 2-methoxy-2-methylpropane

D. methoxybenzene

Answer: C

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67. Rate law for the reaction $A + B \rightarrow \text{product}$ is $\text{rate} = k[A]^2[B]$. What is the rate constant, if rate of reaction at a given temperature is $0.22 M s^{-1}$, when $[A] = 1 M$ and $[B] = 0.25 M$?

A. $3.52 M^{-2} s^{-1}$

B. $0.88 M^{-2} s^{-1}$

C. $1.136 M^{-2} s^{-1}$

D. $0.05 M^{-2} s^{-1}$

Answer: B

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68. Presence of nitrogen in which among the following compounds can not be detected by Lassaigne method ?

A. Hydrazine

B. Aniline

C. p-toluidine

D. Picric acid

Answer: A



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69. 20 mL solution is 0.1 M ferrous sulphate was completely oxidised using a suitable oxidising agent . What is the number of electrons exchanged ?

A. 1.204×10^{22}

B. 193

C. 1930

D. 1.204×10^{21}

Answer: D

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70. Among the following select the alkane that is expected to have lowest boiling point

A. hexane

B. 2-methylpentane

C. 3-methylpentane

D. 2,2-dimethylbutane

Answer: D

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71. 

Identify the compound 'D' in above mentioned series of reactions .

A. 

B. 

C. 

D. 

Answer: B

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72. Which among the following gases can be liquified easily ?

A. Chlorine

B. Nitrogen

C. Oxygen

D. Hydrogen

Answer: A



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73. What is the mass of one molecule of yellow phosphorus ? (Atomic mass , P = 30)

A. 1.993×10^{-22} kg

B. 1.993×10^{-19} mg

C. 4.983×10^{-20} mg

D. 4.983×10^{-23} kg

Answer: B



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74. Ozone is present as a chief constituent in which region of the atmosphere?

- A. Troposphere
- B. Stratosphere
- C. Mesosphere
- D. Thermosphere

Answer: B



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75. The plot of square root of frequency of X-ray emitted against atomic number led to suggestion of which law/rule?

- A. Periodic law
- B. Modern periodic law
- C. Hund's rule

D. Newland's law

Answer: B



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76. The compound that yields only ketonic compound/s on ozonolysis is

A. but-2-ene

B. pent -2 ene

C. 2,3 -dimethylbut-2-ene

D. 2-methylbut-2-ene

Answer: C



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77. which among the following metals is refined by electrolytic method?

A. Aluminium

B. Bismuth

C. Tin

D. Lead

Answer: A

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78. The two monomers used in the preparation of dextran are

A. 3-hydroxy butanoic acid and 3-hydroxy pentanoic acid

B. ϵ amino caproic acid and glycine

C. isobutylene and isoprene

D. lactic acid and glycolic acid

Answer: D

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79. Which oxyacid of sulphur contains S-S single bond?

- A. Oleum
- B. Marshall's acid
- C. Dithionic acid
- D. Thiosulphuric acid

Answer: C



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80. Amongst the following select the element having highest ionization enthalpy.

- A. Sodium
- B. Potassium
- C. Beryllium

D. Magnesium

Answer: C



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81. Identify the alkene that is produced in the following series of reactions



A. 

B. 

C. 

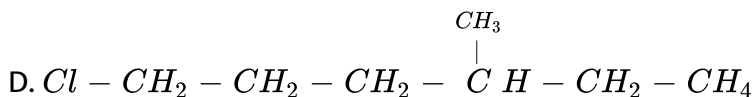
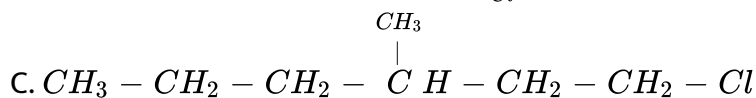
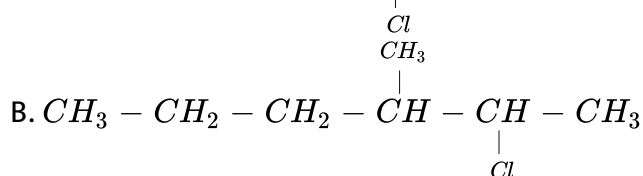
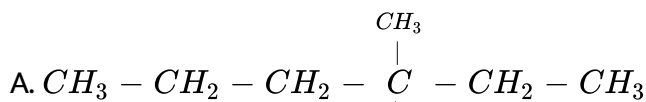
D. 

Answer: A



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82. 'X' is an optically active alkane having lowest molecular mass, Predict the structure of the major product obtained on monochlorination of 'X'.



Answer: A



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83. Butylated hydroxy toluene is used in

A. preventing oxidative rancidity of fats

B. preserving food grains

C. killing bacteria living tissues

D. reducing stress and anxiety

Answer: A



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84. Deficiency of which vitamin causes degeneration of spinal cord ?

A. E

B. K

C. B_{12}

D. A five membered ring is fused with six membered ring only

Answer: C



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85. Bond order of which among the following molecules is zero ?



Answer: C



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86. Benzene can be conveniently converted into n-propyl benzene by

A. Friedel-Craft alkylation with n-propyl chloride

B. Friedel-Craft acylation with propionyl chloride followed by Wolff-Kishner reduction

C. Friedel-Craft acylation with propionyl chloride followed by catalytic hydrogenation

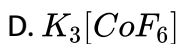
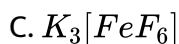
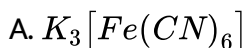
D. Friedel-Craft acylation with propionyl chloride followed by reduction with $LiAlH_4$

Answer: B

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87. Select the diamagnetic complex ion amongst the following complexes

(At.no : Fe = 26 , CO = 27)



Answer: B

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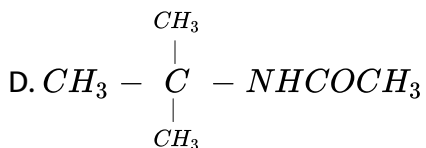
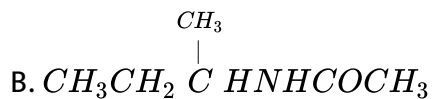
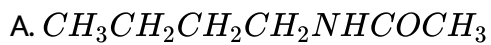
88. One mole of stachyose on hydrolysis yields

- A. 1 mole of glucose + 1 mole of fructose + 2 mole of galactose
- B. 2 mole of glucose + 1 mole of fructose + 1 mole of galactose
- C. 1 mole of glucose + 2 mole of fructose + 1 mole of galactose
- D. 2 mole of glucose + 2 mole of fructose

Answer: A

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89. An organic compound X having molecular formula $C_3H_{11}N$ reacts with p-toluene sulphonyl chloride to form a compound Y that is soluble in aqueous KOH. Compound X is optically active and reacts with acetyl chloride to form compound Z. Identify the compound Z



Answer: B



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