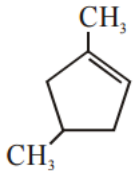
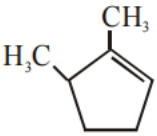
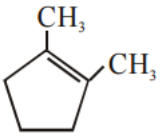
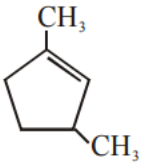
61. Which compound would give 5-keto-2-methyl hexanal upon ozonlysis?

(1) 

(2) 

(3) 

(4) 

62. Which of the vitamins given below is water soluble

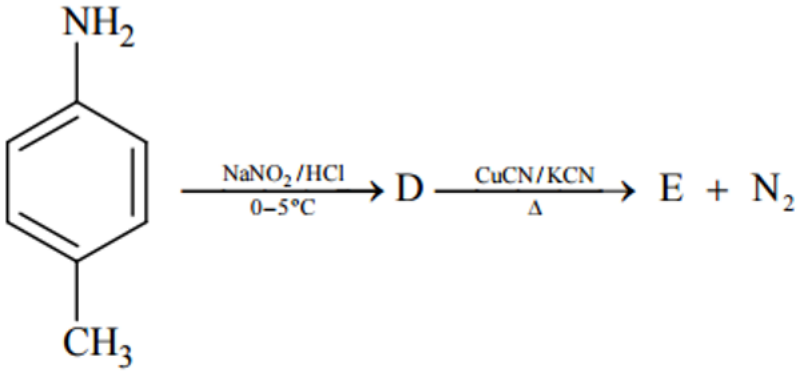
(1) Vitamin E (2) Vitamin K

(3) Vitamin C (4) Vitamin D

63. Which one of the following alkaline earth metal sulphates has its hydration enthalpy greater than its lattice enthalpy ?

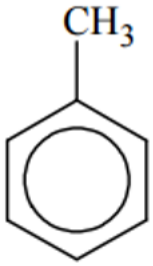
(1) $BaSO_4$ (2) $SrSO_4$ (3) $CaSO_4$ (4) $BeSO_4$

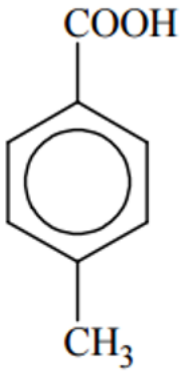
64. In the reaction:

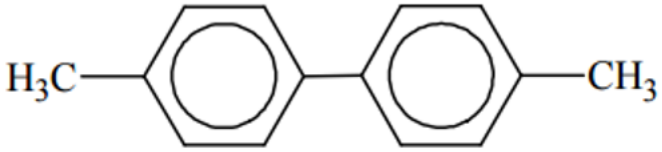


the product E is

(1) 

(2) 

(3) 

(4) 

65. Sodium metal crystallizes in a body centred cubic lattice with a unit cell edge of 4.29Å. The radius of sodium atom is approximately:-
(1) 5.72Å (2) 0.93Å (3) 1.86Å (4) 3.022Å

66. Which of the following compounds is not colored yellow?
(1) $(NH_4)_3[As(Mo_3O_{10})_4]$ (2) $BaCrO_4$ (3) $Zn_2[Fe(CN)_6]$
(4) $K_3[Co(NO_2)_6]$

67. Which of the following is the energy of a possible excited state of hydrogen?
(1) –3.4 eV (2) +6.8 eV (3) -13.6 eV (4) -6.8 eV

68. Which of the following compounds is not an antacid?
(1) Phenelzine (2) Ranitidine (3) Aluminium hydroxide
(4) Cimetidine

69. The ionic radii (in Å) of N^{3-} , O^{2-} and F^{-} are respectively:
(1) 1.36, 1.71 and 1.40 (2) 1.71, 1.40 and 1.36
(3) 1.71, 1.36 and 1.40 (4) 1.36, 1.40 and 1.71

70. In the context of the Hall-Heroult process for the extreaction of Al, which of the following statements is false ?
(1) Al^{3+} is reduced at the cathode to form Al
(2) Na_3AlF_6 serves as the electrolyte
(3) CO and CO_2 are produced in this process
(4) Al_2O_3 is mixed with CaF_2 which lowers the melting point of the mixture and brings conductivity

71. In the following sequence of reaction:

$$toluene \xrightarrow{KMnO_4} A \xrightarrow{SOCl_2} B \xrightarrow[BaSO_4]{H_2/Pd} C$$

The product C is

(1) $C_6H_5CH_2OH$ (2) C_6H_5CHO

(3) C_6H_5COOH (4) $C_6H_5CH_3$

72. Higher order (>3) reactions are rare due to:-

(1) shifting of equilibrium towards reactants due to elastic collision

(2) loss of active species on collision

(3) low probability of simultaneous collision of all the reacting species

(4) increase in entropy and activation energy as more molecules are involved.

73. Which of the following compounds will exhibit geometrical isomerism?

(1) 2-Phenyl-1-butene (2) 1,1-Diphenyl-1-propane

(3) 1-Phenyl-2-butene (4) 3-Phenyl-1-butene

74. Match the catalysts to the correct processes :-

	Catalyst		Process
(A)	$TiCl_3$	(i)	Wacker process
(B)	$PdCl_2$	(ii)	Ziegler-Natta polymerization
(C)	$CuCl_2$	(iii)	Contact process
(D)	V_2O_5	(iv)	Deacon's process

(1) A-ii, B-iii, C-iv, D-i

(2) A-iii, B-i, C-ii, D-iv

(3) A-iii, B-ii, C-iv, D-i

(4) A-ii, B-i, C-iv, D-iii

75. The intermolecular interaction that is dependent on the inverse cube of distance between the molecules is :-

(1) London force (2) Hydrogen bond

(3) ion-ion interaction (4) ion-dipole interaction

76. The molecular formula of a commercial resin used for exchanging ions in water softening is $C_8H_7SO_3Na$ (Mol. w.t 206). What would be the maximum uptake of Ca^{2+} ions by the resin when expressed in mole per gram resin?

(1) 2/309 (2) 1/412 (3) 1/103 (4) 1/206

77. Two Faraday of electricity is passed through a solution of $CuSO_4$. The mass of copper deposited at the cathode is : (at. mass of Cu = 63.5 amu)

(1) 2g (2) 127 g (3) 0 g (4) 63.5 g

78. The number of geometrical isomers that can exist for square planar $[Pt(Cl)(py)(NH_3)(NH_2OH)]^+$ is (py = pyridine):

(1) 4 (2) 6 (3) 2 (4) 3

79. In Carius method of estimation of halogens, 250 mg of an organic compound gave 141 mg of AgBr. The percentage of bromine in the compound is : (at. mass Ag = 108; Br = 80)

(1) 48 (2) 60 (3) 24 (4) 36

80. The color of $KMnO_4$ is due to :

(1) L $\rightarrow$ M charge transfer transition

(2) $\sigma - \sigma^*$ transition

(3) M $\rightarrow$ L charge transfer transition

(4) d – d transition

81. The synthesis of alkyl fluoride is best accomplished by:

(1) Finkelstein reaction

(2) Swarts reaction

(3) Free radical fluorination

(4) Sandmeyer's reaction

82. 3g of activated charcoal was added to 50 mL of acetic acid solution (0.06N) in a flask. After an hour it was filtered and the strength of the filtrate was found to be 0.042 N. The amount of acetic acid adsorbed (per gram of charcoal) is :

(1) 42 mg (2) 54 mg (3) 18 mg (4) 36 mg

83. The vapour pressure of acetone at 20°C is 185 torr. When 1.2 g of nonvolatile substance was dissolved in 100 g of acetone at 20°C, its vapour pressure was 183 torr. The molar mass(g mol^{-1}) of the substance is :

(1) 128 (2) 488 (3) 32 (4) 64

84. Which among the following is the most reactive ?

(1) I_2 (2) ICl (3) Cl_2 (4) Br_2

85. The standard Gibbs energy change at 300 K for the reaction $2A$ É $B + C$ is 2494.2J. At a given time, the composition of the reaction mixture is [A] = 1 2 , [B] = 2 and [C] = 1 2 . The reaction proceeds in the : [R = 8.314 J/K/mol, e = 2.718]

(1) forward direction because Q < K_c

(2) reverse direction because Q < K_c

(3) forward direction because Q > K_c

(4) reverse direction because $Q > K_c$

86. Assertion : Nitrogen and Oxygen are the main components in the atmosphere but these do not react to form oxides of nitrogen.
Reason : The reaction between nitrogen and oxygen requires high temperature.

(1) The assertion is incorrect, but the reason is correct

(2) Both the assertion and reason are incorrect

(3) Both assertion and reason are correct, and the reason is the correct explanation for the assertion

(4) Both assertion and reason are correct, but the reason is not the correct explanation for the assertion

87. Which one has the highest boiling point ?

(1) Kr (2) Xe (3) He (4) Ne

88. Which polymer is used in the manufacture of paints and lacquers ?

(1) Polypropene (2) Poly vinyl chloride

(3) Bakelite (4) Glyptal

89. The following reaction is performed at 298 K.
$2NO(g) + O_2(g)$ É $2NO_2(g)$ The standard free energy of formation of NO(g) is 86.6 kJ/mol at 298 K. What is the standard free energy of formation of $NO_2(g)$ at 298 K ? ($K_p = 1.6 \times 10^{12}$)

(1) $86600 - \frac{\ln(1.6\times10^{12})}{R(298)}$

(2) $0.5[2\times 86600 - R(298)\ln(1.6\times 10^{12})]$

(3) $R(298)\ln(1.6\times 10^{12}) - 86600$

(4) $86600 + R(298)\ln(1.6\times 10^{12})$

90. From the following statements regarding H_2O_2, choose the incorrect statement:

(1) It has to be stored in plastic or wax lined glass bottles in dark

(2) It has to be kept away from dust

(3) It can act only as an oxidizing agent

(4) It decomposes on exposure to light