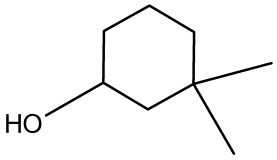
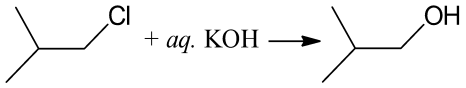
51. The IUPAC name of the compound

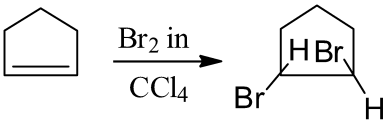


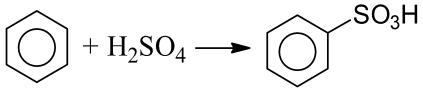
a) 3, 3-dimethyl-1-hydroxy cyclohexane b) 1, 1-dimethyl-3- hydroxy cyclohexane

c) 3, 3- dimethy-1- cyclohexanol d) 1,1-dimethyl-3-cyclohexanol

52. The addition reaction among the following is

a) 

b) 

c) 

d) All of the above

53. Racemic compound has

a) Equimolar mixture of enantiomers b) 1:1 mixture of enantiomer and diastereomer

c) 1:1 mixture of diastereomers d) 1:2 mixture of enantiomers

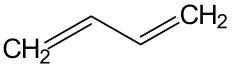
54. The following compound will undergo electrophilic substitution more readily than benzene

a) Nitrobenzene b) Benzoic acid

c) Benzaldehyde d) Phenol

55. Which of the following represents the given mode of hybridization $sp^2 - sp^2 - sp - sp$ from left to right?

a) $CH_2 = CH - C{\equiv}CH$ b) $HC{\equiv}C - C{\equiv}N$

c) $CH_2 = C - C = CH_2$ d) 

56. Which of the following applies in the reaction $CH_3CHBrCH_2CH_3\ Alco.KOH \rightarrow$?

$(I)CH_3CH = CHCH_3$(Major product)

$(II)CH_2 = CHCH_2CH_3$(Minor product)

a) Hofmann's rule b) Saytzeff's rule

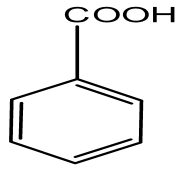
c) Kharasch effect d) Markownikoff's rule

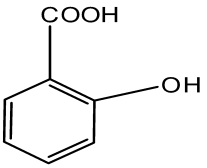
57. Carbon and hydrogen are estimated in organic compounds by

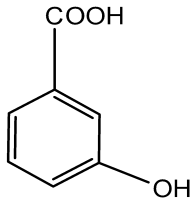
a) Kjeldalhl's method b) Duma's method

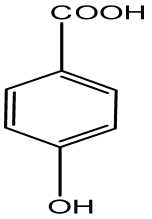
c) Leibig's method d) Carius method

58. Which of the following aromatic acid is most acidic?

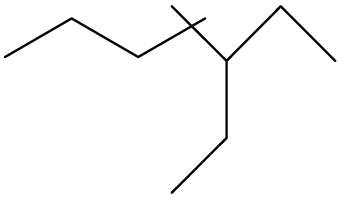
a) 

b) 

c) 

d) 

59. The IUPAC name of



a) 1,1-diethyl1-2, 2-dimethylpentane
b) 4,4-dimethyl-5,5-diethylpentane
c) 5, 5-diethyl-4,4-dimethylpentane
d) 3-ethyl-4,4-dimethylheptane

60. $C_3H_5Cl + aq.NaOH \rightarrow C_2H_5OH + NaCl$;
this reaction is
a) Electrophilic substitution of I order
b) Electrophilic substitution of II order
c) Nucleophilic substitution of I order
d) Nucleophilic substitution of II order

61. CH_3CH_2OH and CH_3OCH_3 are the example of
a) Chain isomerism
b) Functional isomerism
c) Position isomerism
d) Metamerism

62. The alkyl halide that undergoes S_N1 reaction more radily is
a) Ethyl bromide
b) Isopropyl bromide
c) Vinyl bromide
d) n-propyl bromide

63. Arrange the following carbocations in order of stability

benzyl	allyl	methyl	vinyl
I	II	III	IV

a) IV>III>II>I
b) I>II>III>IV
c) II>IV>III>I
d) III>II>I>IV

64. Consider the following reaction

Is an example of

a) Substitution
b) Elimination
c) Addition
d) Addition elimination

65. A saturated solution prepared by dissolved $CaF_2(s)$ in water, has $\left[Ca^{2+}\right] = 3.3 \times 10^{-4}$ M. What is the K_{sp} of CaF_2?

a) 1.44×10^{-10}
b) 2.24×10^{-8}
c) 1.58×10^{-8}
d) 1.67×10^{-8}

66. The solubility in water of a sparingly soluble salt A_2B is $1.0\times10^{-3} mol\ L^{-1}$. Its solubility product will be

a) 4×10^{-9}
b) 4×10^{9}
c) 1×10^{9}
d) 1×10^{-9}

67. 15 moles of H_2 *and* 5.2 *moles of* I_2 are mixed and allowed to attain equilibrium at 500°C. At equilibrium, the concentration of HI is found to be 10 moles. The equilibrium constant for the formation of HI is

a) 50
b) 15
c) 100
d) 25

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

$$SO_2(g) + \frac{1}{2}O_2(g) \rightleftharpoons SO_3(g)$$

$$2SO_3(g) \rightleftharpoons 2SO_2(g) + O_2(g)$$

The equilibrium constants are related as

a) $2K_1 = K_2^2$
b) $K_1^2 = \frac{1}{K_2}$
c) $K_2^2 = \frac{1}{K_1}$
d) $K_2 = \frac{2}{K_1^2}$

69. The pK_a of a weak acid, HA, is 4.80. The pK_b of a weak base, BOH is 4.78. The pH of an aqueous solution of the corresponding salt, BA, will be

a) 9.58
b) 4.79
c) 7.01
d) 9.22

70. For the reaction $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$; $\Delta H = -93.6\ kJ\ mol^{-1}$, the concentration of NH_3 at equilibrium can be increased by

(I) lowering the temperature
(II)low pressure
(III)excess of N_2
(IV)excess of H_2

a) (II) and (IV) are correct
b) (II) only is correct
c) (I), (II) and (III) are correct
d) (III) and (IV) are correct

71. According to law of mass action, for the reaction
$2A + B \rightarrow$ Products

a) Rate $= k[A][B]$
b) Rate $= k[A]^2[B]$
c) Rate $= k[A][B]^2$
d) Rate $= k[A]^{1/2}[B]$

72. Conjugate acid of $S_2O_8^{2-}$ is

a) $H_2S_2O_8$
b) H_2SO_4
c) $HS_2O_8^-$
d) HSO_4^-

73. 4 moles each of SO_2 *and* O_2 gases are allowed to react to form SO_3 in a closed vessel. At equilibrium 25% of O_2 is used up. The total number of moles of all the gases at equilibrium is

a) 6.5
b) 7.0
c) 8.0
d) 2.0

74. The expression for the solubility product of $Al_2(SO_4)_3$ is

a) $K_{sp} = [Al^{3+}]\,[SO_4^{2-}]$
b) $K_{sp} = \left[Al^{3+}\right]^2\left[SO_4^{2-}\right]^3$
c) $K_{sp} = \left[Al^{3+}\right]^3\left[SO_4^{2-}\right]^2$
d) $K_{sp} = \left[Al^{3+}\right]^2\left[SO_4^{2-}\right]^2$

75. In the reactions, $A + 2B \rightleftharpoons 2C$, if 2 moles of A, 3.0 moles of B and 2.0 moles of C are placed in a 2 L flask and the equilibrium concentration of C is 0.5 mol/L, the equilibrium constant (K_c) for the reactions is

a) 0.21
b) 0.50
c) 0.75
d) 0.025

76. 9.2g N_2O_4 is heated in a 1L vessel till equilibrium state is established

$$N_2O_4(g) \rightleftharpoons 2NO_2(g)$$

In equilibrium state 50% N_2O_4 was dissociated, Equilibrium constant will be (mol. wt. of $N_2O_4 = 92$)

a) 0.1 b) 0.4

c) 0.3 d) 0.2

77. $\Delta E°$of combustion of isobutylene is $-x\ kJ\ mol^{-1}$. The value of $\Delta H°$ is

a) $= \Delta E°$ b) $> \Delta E°$

c) $= 0$ d) $< \Delta E°$

78. The enthalpy change for the transition of liquid water to steam is $\Delta H_{vap} = 37.3\ kJ\ mol^{-1}$ at 373 K. The entropy change for the process is

a) $132.5\ J\ mol^{-1}K^{-1}$ b) $100\ J\ mol^{-1}K^{-1}$

c) $135.3\ J\ mol^{-1}K^{-1}$ d) $75.5\ J\ mol^{-1}K^{-1}$

79. A gas can expand from 100 mL to 250 mL under a constant pressure of 2 atm. The work done by gas is

a) 30.38 J b) 25 J

c) 5 kg J d) 16 J

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

a) For an isochoric process=$\Delta E = -Q$ b) For an adiabatic process=$\Delta E = -W$

c) For an isothermal process=$Q = +W$ d) For a cyclic process=$Q = -W$

51	C	61	B	71	B
52	B	62	C	72	C
53	A	63	B	73	A
54	D	64	D	74	B
55	A	65	A	75	A
56	B	66	A	76	D
57	C	67	A	77	D
58	B	68	B	78	B
59	D	69	C	79	A
60	D	70	C	80	D