JEE Main April 2025

Question Paper With Text Solution

03 April | Shift-1

CHEMISTRY

MATRIX

JEE Main & Advanced | XI-XII Foundation| VI-X Pre-Foundation

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JEE MAIN APRIL 2025 | 03 APRIL SHIFT-1

SECTION – A

51. In a reaction $A + B \rightarrow C$, initial concentrations of A and B are related as $[A]_0 = 8[B]_0$. The half lives of A and B are 10 min and 40 min, respectively. If they start to disappear at the same time, both following first order kinetics, after how much time will the concentration of both the reactants be same?

(1) 20 min (2) 60 min (3) 80 min (4) 40 min

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

Question ID : 347577583

Ans. Official answer NTA (4)

Sol.

52. Correct order of limiting molar conductivity for cations in water at 298 K is :

(1) $H^+ > Na^+ > K^+ > Ca^{2+} > Mg^{2+}$ (2) $H^+ > Ca^{2+} > Mg^{2+} > K^+ > Na^+$

(3) $Mg^{2+} > H^+ > Ca^{2+} > K^+ > Na^+$ (4) $H^+ > Na^+ > Ca^{2+} > Mg^{2+} > K^+$

Question ID : 347577581

Ans. Official answer NTA (2)

Sol.

53. The correct order of the complexes $\left[Co(NH_3)_5(H_2O)\right]^{3+}$ (A), $\left[Co(NH_3)_6\right]^{3+}$ (B), $[Co(CN)_6]^{3-}$ (C) and $\left[CoCl(NH_3)_5\right]^{2+}$ (D) in terms of wavelength of light absorbed is"Options

(1) D > C > B > A

(2) C > B > D > A

(3) C > B > A > D

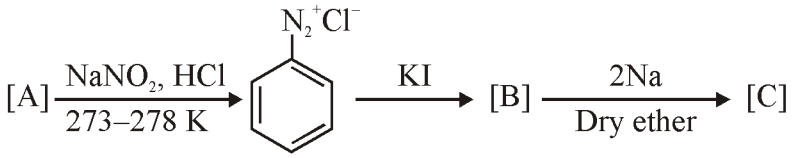
(4) D > A > B > C

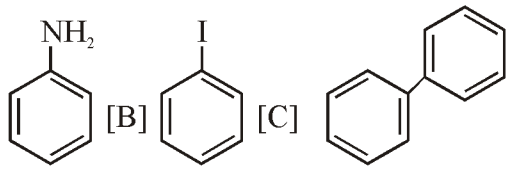
Question ID : 347577588

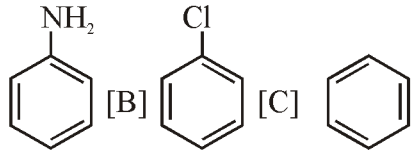
Ans. Official answer NTA (4)

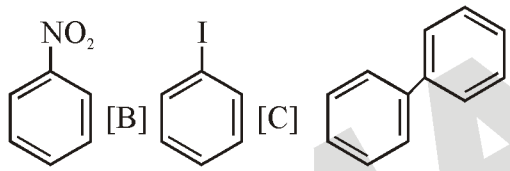
Sol.

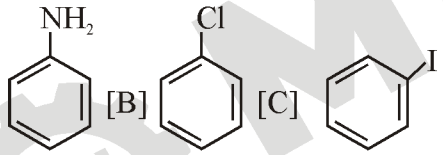
54. Identify [A], [B] and [C], respectively in the following reaction



(1) 

(2) 

(3) 

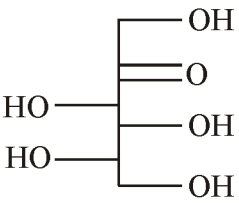
(4) 

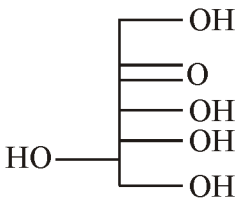
Question ID : 347577591

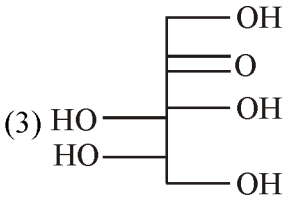
Ans. Official answer NTA (1)

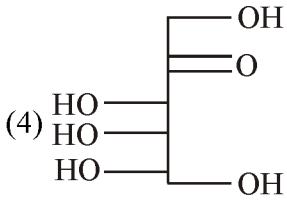
Sol.

55. Which of the following is the correct structure of L-Fructose?

(1) 

(2) 

(3) 

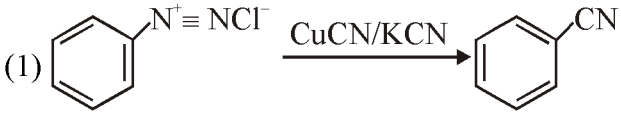
(4) 

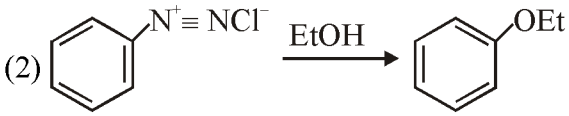
Question ID : 347577595

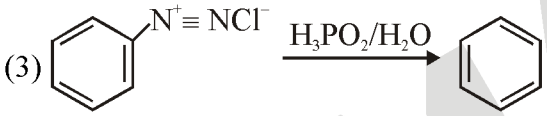
Ans. Official answer NTA (3)

Sol.

56. In the following reactions, which one is NOT correct?

(1) 

(2) 

(3) 

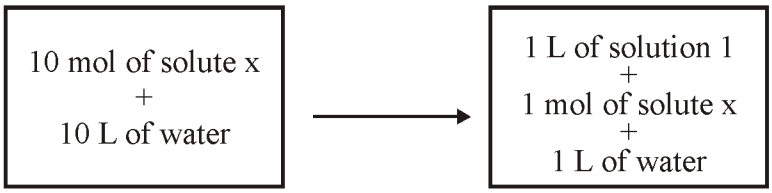
(4) 

Question ID : 347577594

Ans. Official answer NTA (2)

Sol.

57. Which of the following properties will change when system containing solution 1 will become solution 2 ?



(1) Concentration

(2) Molar heat capacity

(3) Density

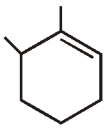
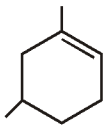
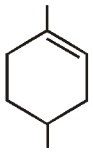
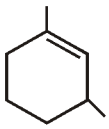
(4) Gibbs free energy

Question ID : 347577578

Ans. Official answer NTA (4)

Sol.

58. Which compound would give 3-methyl-6-oxoheptanal upon ozonolysis ?

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

Question ID : 347577590

Ans. Official answer NTA (3)

Sol.

59. Which of the following postulate of Bohr's model of hydrogen atom is not in agreement with quantum mechanical model of an atom?

(1) When an electron makes a transition from a higher energy stationary state to a lower energy stationary state, then it emits a photon of light.

(2) An atom can take only certain distinct energies E_1, E_2, E_3, etc. These allowed states of constant energy are called the stationary states of atom.

(3) An atom in a stationary state does not emit electromagnetic radiation as long as it stays in the same state.

(4) The electron in a H atom's stationary state moves in a circle around the nucleus.

Question ID : 347577577

Ans. Official answer NTA (4)

Sol.

60. Which of the following statements are correct?

A. The process of adding an electron to a neutral gaseous atom is always exothermic.

B. The process of removing an electron from an isolated gaseous atom is always endothermic.

C. The 1^{st} ionization energy of boron is less than that of beryllium.

D. The electronegativity of C is 2.5 in CH_4 and CCl_4

E. Li is the most electropositive among elements of group I.

Choose the correct answer from the options given below:

(1) B and C Only (2) B and D Only (3) B, C and E Only (4) A, C and D Only

Ans.

Question ID : 347577585

Ans. Official answer NTA (1)

61. The metal ions that have the calculated spin-only magnetic moment value of 4.9 B.M. are :

A. Cr^{2+} B. Fe^{2+} C. Fe^{3+} D. Co^{2+} E. Mn^{3+}

Choose the correct answer from the options given below:

(1) A, B and E Only (2) A, C and E Only (3) A, D and E Only (4) B and E Only

Question ID : 347577587

Ans. Official answer NTA (1)

Sol.

62. Number of molecules from below which cannot give iodoform reaction is:

Ethanol, Isopropyl alcohol, Bromoacetone, 2-Butanol, 2-Butanone, Butanal, 2-Pentanone, 3-Pentanone, Pentanal and 3-Pentanol.

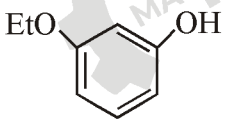
(1) 5 (2) 4 (3) 3 (4) 2

Question ID : 347577593

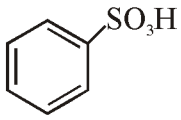
Ans. Official answer NTA (2)

Sol.

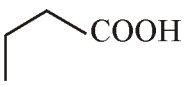
63. The least acidic compound, among the following is



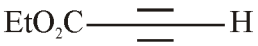
[A]



[B]



[C]



[D]

(1) C (2) B (3) A (4) D

Question ID : 347577592

Ans. Official answer NTA (4)

Sol.

64. Given below are two statements:

Statement I : The $N-N$ single bond is weaker and longer than that of $P-P$ single bond.

Statement II : Compounds of group 15 elements in +3 oxidation states readily undergo disproportionation reactions.

In the light of the above statements, choose the correct answer from the options given below

(1) Both Statement I and Statement II are false

(2) Statement I is true but Statement II is false

(3) Both Statement I and Statement II are true

(4) Statement I is false but Statement II is true

Question ID : 347577586

Ans. Official answer NTA (1)

Sol.

65. Given below are two statements:

Statement I : A catalyst cannot alter the equilibrium constant (K_c) of the reaction, temperature remaining constant.

Statement II : A homogenous catalyst can change the equilibrium composition of a system, temperature remaining constant.

In the light of the above statements, choose the correct answer from the options given below

(1) Both Statement I and Statement II are true

(2) Statement I is true but Statement II is false

(3) Both Statement I and Statement II are false

(4) Statement I is false but Statement II is true

Question ID : 347577582

Ans. Official answer NTA (1)

Sol.

66. 2 moles each of ethylene glycol and glucose are dissolved in 500 g of water. The boiling point of the resulting

solution is:

(Given : Ebullioscopic constant of water $= 0.52\,K\,kg\,mol^{-1}$)

(1) 379.2 K (2) 375.3 K (3) 377.3 K (4) 277.3 K

Question ID : 347577579

Ans. Official answer NTA (3)

Sol.

67. Among 10^{-9} g (each) of the following elements, which one will have the highest number of atoms?

Element: Pb, Po, Pr and Pt

(1) Pb (2) Po (3) Pt (4) Pr

Question ID : 347577576

Ans. Official answer NTA (4)

Sol.

68. In the following system, $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$ at equilibrium, upon addition of xenon gas at constant T & p, the concentration of

(1) Cl_2 will decrease

(2) PCl_3 will increase

(3) PCl_5, PCl_3 & C_2 remain constant

(4) PCl_5 will increase

Question ID : 347577580

Ans. Official answer NTA (2)

Sol.

69. Match the LIST-I with LIST-II

LIST-I (Molecules/ion)	LIST-II (Hybridisation of central atom)
A. PF_5	I. dsp^2
B. SF_6	II. sp^3d
C. $Ni(CO)_4$	III. sp^3d^2
D. $[PtCl_4]^{2-}$	IV. sp^3

Choose the correct answer from the options given below:

(1) A-IV, B-I, C-II, D-III

(2) A-III, B-I, C-IV, D-II

(3) A-II, B-III, C-IV, D-I

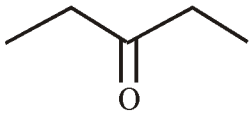
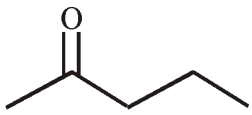
(4) A-I, B-II, C-III, D-IV

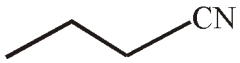
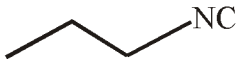
Question ID : 347577584

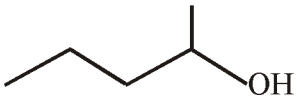
Ans. Official answer NTA (3)

Sol.

70. Identify the correct statements from the following.

A.  and  are metamers

B.  and  are functional isomers

C.  and  are position isomers

D.  and  are homologous

Choose the correct answer from the options given below :

(1) B & C only

(2) A & B only

(3) A, B & C only

(4) C & D only

Question ID : 347577589

Ans. Official answer NTA (2)

Sol.

SECTION – B

71. Given :

$\Delta H_{sub}[C(\text{ graphite })] = 710\,kJ\,mol^{-1}$

$\Delta_{C-H}H^{\ominus} = 414\,kJ\,mol^{-1}$

$\Delta_{H-H^{H}}H^{\ominus} = 436\,kJ\,mol^{-1}$

$\Delta_{C=C^{H}}{}^{\ominus} = 611\,kJ\,mol^{-1}$

The $\Delta H_f^{\ominus}$ for $CH_2 = CH_2$ is _____ $kJmol^{-1}$ (nearest integer value)

Question ID : 347577596

Ans. Official answer NTA (25)

Sol.

72. 0.5 g of an organic compound on combustion gave 1.46 g of CO_2 and 0.9 g of H_2O. The percentage of

carbon in the compound is _____. (Nearest integer)

[Given : Molar mass (in $gmol^{-1}$) C : 12, H : 1, O : 16]

Question ID : 347577599

Ans. Official answer NTA (80)

Sol.

73. The number of optical isomers exhibited by the iron complex (A) obtained from the following reaction is _____.

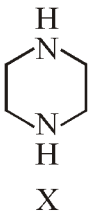
$$FeCl_3 + KOH + H_2C_2O_4 \rightarrow A$$

Question ID : 347577597

Ans. Official answer NTA (2)

Sol.

74. During estimation of nitrogen by Dumas' method of compound X(0.42g)



X

_____ mL of N_2 gas will be liberated at STP. (nearest integer)

(Given molar mass in $gmol^{-1}$: C : 12, H : 1, N : 14)

Question ID : 347577600

Ans. Official answer NTA (109)

Sol.

75. Consider the following reactions

$$A + NaCl + H_2SO_4 \rightarrow CrO_2Cl_2 + SideProducts$$

Littleamountn

$$CrO_2Cl_{2\,(Vapour)} + NaOH \rightarrow B + NaCl + H_2O$$

$$B + H^+ \rightarrow C + H_2O$$

The number of terminal ' O ' present in the compound ' C ' is _____.

Question ID : 347577598

Ans. Official answer NTA (6)

Sol.