

JEE Main January 2026
Question Paper With Text Solution
22 January | Shift-1

CHEMISTRY



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

Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911
Website : www.matrixedu.in ; Email : smd@matrixacademy.co.in

क

(1) Run 1 = Run 2 = Run 3

(2) Run 3 < Run 1 < Run 2

(3) Run 3 < Run 1 = Run 2

(4) Run 1 < Run 2 < Run 3

Ans. Official answer NTA (3)

Sol.

Question ID : 444792212

54. Consider the transition metal ions Mn^{3+} , Cr^{3+} , Fe^{3+} and Co^{3+} and all form low spin octahedral complexes. The correct decreasing order of unpaired electrons in their respective d-orbitals of the complexes is :

क

 (1) $Cr^{3+} > Mn^{3+} > Fe^{3+} > Co^{3+}$

 (2) $Mn^{3+} > Fe^{3+} > Co^{3+} > Cr^{3+}$

 (3) $Fe^{3+} > Co^{3+} > Mn^{3+} > Cr^{3+}$

 (4) $Cr^{3+} > Fe^{3+} > Co^{3+} > Mn^{3+}$
Ans. Official answer NTA (1)

Sol.

Question ID : 444792207

55. A 'p'-block element (E) and hydrogen form a binary cation $(EH_x)^+$, while EH_3 on treatment with K_2HgI_4 in alkaline medium gives a precipitate of basic mercury(II)amido-iodine. Given below are first ionisation enthalpy values ($kJ mol^{-1}$) for first element each from group 13, 14, 15 and 16. Identify the correct first ionisation enthalpy value for element E .

क

(1) 1402

(2) 801

(3) 1312

(4) 1086

Ans. Official answer NTA (1)

Sol.

Question ID : 444792217

56. As compared with chlorocyclohexane, which of the following statements correctly apply to chlorobenzene?

A. The magnitude of negative charge is more on chlorine atom.

B. The C – Cl bond has partial double bond character.

C. C – Cl bond is less polar.

D. C – Cl bond is longer due to repulsion between delocalised electrons of the aromatic ring and lone pairs of electrons of chlorine.

 E. The C – Cl bond is formed using sp^2 hybridised orbital of carbon.

Choose the correct answer from the options given below:

MATRIX JEE ACADEMY
Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911
Website : www.matrixedu.in ; Email : smd@matrixacademy.co.in

क

(1) B, C and E Only

(2) A, D and E Only

(3) B, C and D Only

(4) A, C and E Only

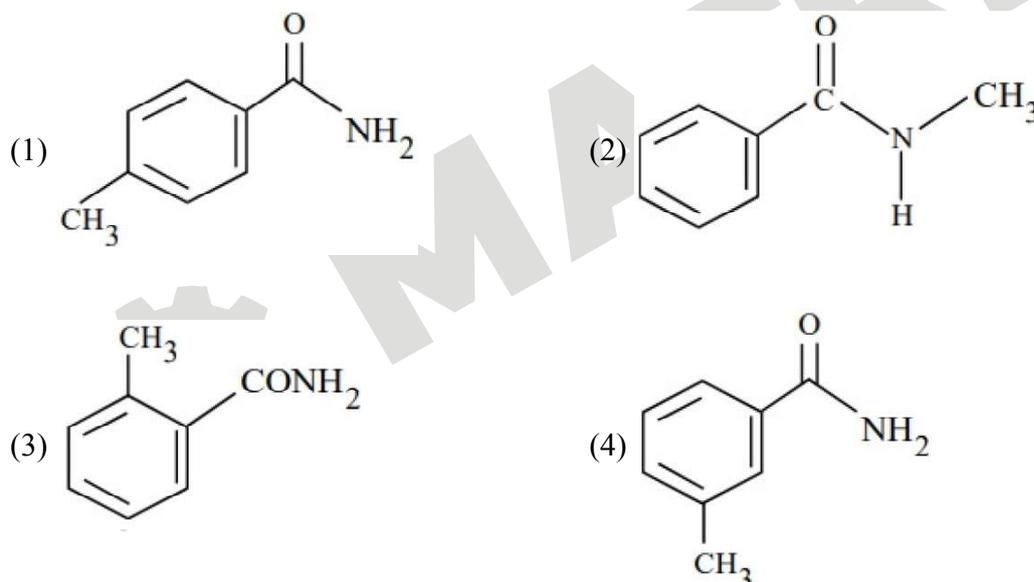
Ans. Official answer NTA (1)

Sol.

Question ID : 444792219

57. 'A' is a neutral organic compound (M. F : C_8H_9ON). On treatment with aqueous Br_2HO^- , 'A' forms a compound 'B' which is soluble in dilute acid. 'B' on treatment with aqueous $NaNO_2/HCl(0-5^\circ C)$ produces a compound 'C' which on treatment with $CuCN/NaCN$ produces 'D'. Hydrolysis of 'D' produces 'E' which is also obtainable from the hydrolysis of 'A'. 'E' on treatment with acidified $KMnO_4$ produces 'F'. 'F' contains two different types of hydrogen atoms. The structure of 'A' is

क


Ans. Official answer NTA (1)

Sol.

Question ID : 444792205

58. Given below are two statements:

Statement I: The Henry's law constant K_H is constant with respect to variations in solution's concentration over the range for which the solution is ideally dilute.

Statement II: K_H does not differ for the same solute in different solvents.

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

MATRIX JEE ACADEMY
Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911
Website : www.matrixedu.in ; Email : smd@matrixacademy.co.in



क

- (1) Both Statement I and Statement II are false
- (2) Statement I is false but Statement II is true
- (3) Both Statement I and Statement II are true
- (4) Statement I is true but Statement II is false

Ans. Official answer NTA (4)

Sol.

Question ID : 444792210

59. Given below are two statements:

Statement I: The halogen that makes longest bond with hydrogen in HX, has the smallest covalent radius in its group.

Statement II: A group 15 element's hydride EH_3 has the lowest boiling point among corresponding hydrides of other group 15 elements. The maximum covalency of that element E is 4.

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

क

- (1) Statement I is true but Statement II is false
- (2) Statement I is false but Statement II is true
- (3) Both Statement I and Statement II are true
- (4) Both Statement I and Statement II are false

Ans. Official answer NTA (4)

Sol.

Question ID : 444792220

60. Given below are two statements:

Statement I: Sucrose is dextrorotatory. However, sucrose upon hydrolysis gives a solution having mixture of products. This solution shows laevorotation.

Statement II: Hydrolysis of sucrose gives glucose and fructose. Since the laevorotation of glucose is more than the dextrorotation of fructose, the resulting solution becomes laevorotatory.

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

क

- (1) Both Statement I and Statement II are false
 (2) Both Statement I and Statement II are true
 (3) Statement I is false but Statement II is true
 (4) Statement I is true but Statement II is false

Ans. Official answer NTA (4)

Sol.

Question ID : 444792209

61. Two p-block elements X and Y form fluorides of the type EF_3 . The fluoride compound XF_3 is a Lewis acid and YF_3 is a Lewis base. The hybridizations of the central atoms of XF_3 and YF_3 respectively are

क

- (1) sp^2 and sp^3 (2) Both sp^2 (3) Both sp^3 (4) sp^3 and sp^2

Ans. Official answer NTA (1)

Sol. Question ID : 444792218

62. Match the LIST-I with LIST-II.

List-I Reagents		List-II Name of Reaction involving carbonyl compounds	
A.	$NH_2 - NH_2, KOH$	I.	Tollen's Test
B.	$Ag(NH_3)_2OH$	II.	Clemmensen Reduction
C.	Aq. $CuSO_4$, Sodium Potassium tartarate, KOH	III.	Wolff - Kishner Reduction
D.	$Zn - Hg, HCl$	IV.	Fehling's Test

Choose the correct answer from the options given below :

क

- (1) A-III, B-I, C-IV, D-V (2) A-III, B-IV, C-I, D-II
 (3) A-II, B-I, C-IV, D-III (4) A-IV, B-III, C-II, D-I

Ans. Official answer NTA (1)

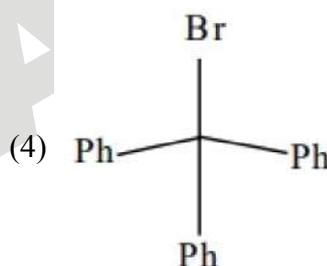
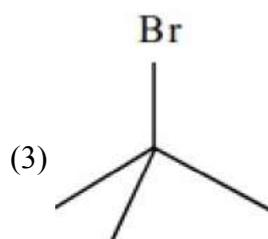
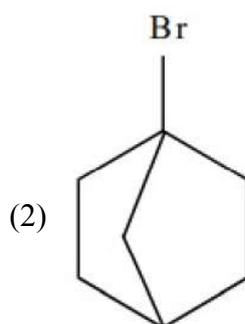
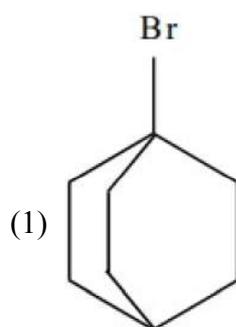
Sol.

Question ID : 444792216

63. The correct order of the rate of reaction of the following reactants with nucleophile by S_N1 mechanism is :

(Given : Structures I and II are rigid)

क



(1) II < I < III < IV

(2) IV < III < II < I

(3) I < II < III < IV

(4) III < I < II < IV

Ans. Official answer NTA (1)

Sol. Question ID : 444792213

64. Given below are two statements:

Statement I: Phenol on treatment with $\text{CHCl}_3/\text{aq. KOH}$ under refluxing condition, followed by acidification produces p-hydroxy benzaldehyde as the major product and o-hydroxy benzaldehyde as the minor product.

Statement II: The mixture of p-hydroxybenzaldehyde and o-hydroxybenzaldehyde can be easily separated through steam distillation.

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

क

MATRIX JEE ACADEMY

Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911

Website : www.matrixedu.in ; Email : smd@matrixacademy.co.in

- (1) Statement I is true but Statement II is false
 (2) Both Statement I and Statement II are false
 (3) Statement I is false but Statement II is true
 (4) Both Statement I and Statement II are true

Ans. Official answer NTA (3)

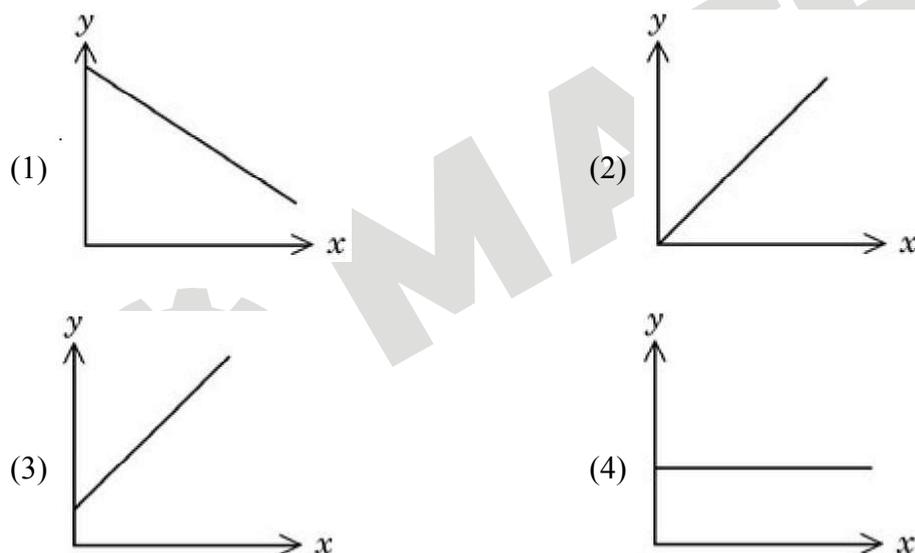
Sol.

Question ID : 444792206

65. Consider a solution of $\text{CO}_2(\text{g})$ dissolved in water in a closed container.

Which one of the following plots correctly represents variation of \log (partial pressure of CO_2 in vapour phase above water) [y-axis] with \log (mole fraction of CO_2 in water) [x-axis] at 25°C ?

क



Ans. Official answer NTA (3)

Sol.

Question ID : 444792201

66. In the reaction,

क



- (1) 11.2 L $\text{H}_2(\text{g})$ at STP is produced for every mole of HCl consumed.
 (2) 33.6 L $\text{H}_2(\text{g})$ is produced regardless of temperature and pressure for every mole of Al that reacts.

(3) 12 L HCl(aq) is consumed for every 6 L H₂(g) produced.

(4) 67.2 L H₂(g) at STP is produced for every mole of Al that reacts.

Ans. Official answer NTA (1)

Sol.

Question ID : 444792214

67. The correct order of reactivity of CH₃Br in methanol with the following nucleophiles is

F⁻, I⁻, C₂H₅O⁻ and C₆H₅O⁻

क

(1) I⁻ > C₆H₅O⁻ > F⁻ > C₂H₅O⁻

(2) I⁻ > C₂H₅O⁻ > C₆H₅O⁻ > F⁻

(3) I⁻ > C₂H₅O⁻ > F⁻ > C₆H₅O⁻

(4) I⁻ > F⁻ > C₆H₅O⁻ > C₂H₅O⁻

Ans. Official answer NTA (2)

Sol.

Question ID : 444792204

68. Match the LIST-I with LIST-II.

List-I		List-II	
Thermodynamic Process		Magnitude in kJ	
A.	Work done in reversible, isothermal expansion of 2 mol of ideal gas from 2 dm ³ to 20 dm ³ at 300 K.	I.	4
B.	Work done in irreversible isothermal expansion of 1 mol ideal gas from 1 m ³ to 3 m ³ at 300 K against a constant pressure of 3kPa.	II.	11.5
C.	Change in internal energy for adiabatic expansion of a 1 mol ideal gas with change of temperature = 320 K and $\bar{C}_V = \frac{3}{2}R$.	III.	6
D.	Change in enthalpy at constant pressure of 1 mol ideal gas with change of temperature = 337 K and $\bar{C}_P = \frac{5}{2}R$.	IV.	7

Choose the correct answer from the options given below :

क

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

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

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

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

Ans. Official answer NTA (3)

Sol.

MATRIX JEE ACADEMY

Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911

Website : www.matrixedu.in ; Email : smd@matrixacademy.co.in

Question ID : 444792211

69. A first row transition metal (M) does not liberate H_2 gas from dilute HCl. 1 mol of aqueous solution of MSO_4 is treated with excess of aqueous KCN and then $H_2S(g)$ is passed through the solution. The amount of MS (metal sulphide) formed from the above reaction is _____ mol.

क

(1) 1

(2) 3

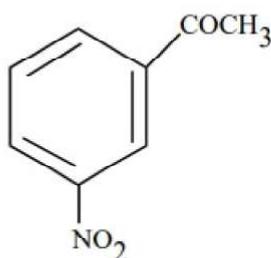
(3) 2

(4) 0

Ans. Official answer NTA (4)**Sol.**

Question ID : 444792215

70. Given below are two statements:

Statement I: Benzene is nitrated to give nitrobenzene, which on further treatmentwith $CH_3COCl / AlCl_3$ will give**Statement II:** $-NO_2$ group is a m-directing, and deactivating group.

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

क

(1) Statement I is incorrect but Statement II is correct

(2) Both Statement I and Statement II are incorrect

(3) Statement I is correct but Statement II is incorrect

(4) Both Statement I and Statement II are correct

Ans. Official answer NTA (1)**Sol.**

SECTION - B

Question ID : 444792224

71. The cycloalkene (X) on bromination consumes one mole of bromine per mole of (X) and gives the product (Y) in which C: Br ratio is 3: 1. The percentage of bromine in the product (Y) is _____%. (Nearest integer)

(Given : molar mass in g mol^{-1} H : 1, C : 12, O : 16, Br : 80)

क

Ans. Official answer NTA (66)**Sol.**

Question ID : 444792225

72. Sodium fusion extract of an organic compound (Y) with CHCl_3 and chlorine water gives violet color to the CHCl_3 layer. 0.15 g of (Y) gave 0.12 g of the silver halide precipitate in Carius method. Percentage of halogen in the compound (Y) is _____. (Nearest integer)

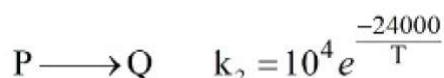
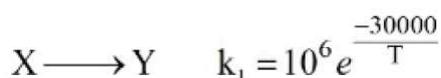
(Given : molar mass g mol^{-1} C : 12, H : 1, Cl : 35.5, Br : 80, I : 127)

क

Ans. Official answer NTA (43)**Sol.**

Question ID : 444792223

73. The temperature at which the rate constants of the given below two gaseous reactions become equal is _____ K. (Nearest integer).

Given : $\ln 10 = 2.303$

क

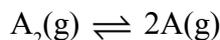
Ans. Official answer NTA (1303)**Sol.****MATRIX JEE ACADEMY**

Office : Piprali Road, Sikar (Raj.) | Ph. 01572-241911
Website : www.matrixedu.in ; Email : smd@matrixacademy.co.in

Question ID : 444792221

 74. Dissociation of a gas A_2 takes place according to the following chemical reaction.

At equilibrium, the total pressure is 1 bar at 300 K .



The standard Gibbs energy of formation of the involved substances has been provided below:

Substance	$\Delta G_f^\circ / \text{kJ mol}^{-1}$
A_2	-100.00
A	-50.832

 The degree of dissociation of $A_2(g)$ is given by $(x \times 10^{-2})^{1/2}$ where $x =$ _____. (Nearest integer).

 [Given: $R = 8 \text{ J mol}^{-1} \text{ K}^{-1}$, $\log 2 = 0.3010$, $\log 3 = 0.48$]

Assume degree of dissociation is not negligible.

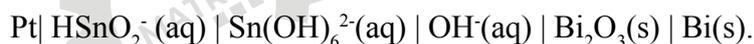
क

Ans. Official answer NTA (33)

Sol.

Question ID : 444792222

75. Consider the following electrochemical cell at 298 K


 If the reaction quotient at a given time is 10^6 , then the cell EMF (E_{cell}) is _____ $\times 10^{-1} \text{ V}$ (Nearest integer).

Given the standard half-cell reduction potential as

$$E^\circ_{\text{Bi}_2\text{O}_3/\text{Bi}, \text{OH}^-} = -0.44 \text{ V} \text{ and } E^\circ_{\text{Sn}(\text{OH})_6^{2-}/\text{HSnO}_2^-, \text{OH}^-} = -0.90 \text{ V}$$

क

Ans. Official answer NTA (4)

Sol.