JEE Main January 2026

Question Paper With Text Solution

24 January | Shift-1

CHEMISTRY

MATRIX

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

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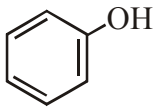
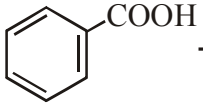
JEE MAIN JANUARY 2026 | 24 JANUARY SHIFT-1

SECTION – A

Question ID : 444792592

51. Consider the following two reactions A and B

(A)  $\xrightarrow{Na}$ Main Product + gas (x)

(B)  $\xrightarrow{NaHCO_3}$ Main Product + gas (y)

Numerical value of [molar mass of x + molar mass of y] is _____ .

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(1) 46 (2) 160 (3) 4 (4) 88

Ans. Official answer NTA (1)

Sol.

Question ID : 444792588

52. Arrange the following carbanions in the decreasing order of stability.

I. $p\text{–}Br\text{–}C_6H_4\text{–}\ddot{C}H_2^{\ominus}$

II. $C_6H_5\text{–}\ddot{C}H_2^{\ominus}$

III. $p\text{–}CH_3O\text{–}C_6H_4\text{–}\ddot{C}H_2^{\ominus}$

IV. $p\text{–}CHO\text{–}C_6H_4\text{–}\ddot{C}H_2^{\ominus}$

V. $p\text{–}CH_3\text{–}C_6H_4\text{–}\ddot{C}H_2^{\ominus}$

Choose the correct answer from the options given below:

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(1) I > II > IV > V > III (2) IV > II > I > III > V

(3) IV > I > II > V > III (4) I > IV > II > V > III

Ans. Official answer NTA (3)

Sol.

Question ID : 444792576

53. Consider a mixture 'X' which is made by dissolving 0.4 mol of $\left[Co\left(NH_3\right)_5 SO_4\right]Br$ and 0.4 mol of $\left[Co\left(NH_3\right)_5 Br\right]SO_4$ in water to make 4 L of solution. When 2 L of mixture 'X' is allowed to react with excess of $AgNO_3$, it forms precipitate 'Y'. The rest 2 L of mixture 'X' reacts with excess $BaCl_2$ to form precipitate 'Z'. Which of the following statements is CORRECT?

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(1) 0.2 mol of 'Z' is formed.

(2) 0.4 mol of 'Z' is formed.

(3) 'Y' is $BaSO_4$ and 'Z' is AgBr.

(4) 0.1 mol of ' Y ' is formed.

Ans. Official answer NTA (1)

Sol.

Question ID : 444792579

54. A solution is prepared by dissolving 0.3 g of a non-volatile non-electrolyte solute 'A' of molar mass $60\,g\,mol^{-1}$ and 0.9 g of a non-volatile non-electrolyte solute 'B' of molar mass $180\,g\,mol^{-1}$ in $100\,mL H_2O$ at $27^{\circ}C$. Osmotic pressure of the solution will be

[Given: $R = 0.082\,L\,atm\,K^{-1}\,mol^{-1}$]

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(1) 2.46 atm (2) 0.82 atm (3) 1.47 atm (4) 1.23 atm

Ans. Official answer NTA (1)

Sol.

Question ID : 444792580

55. 'W' g of a non-volatile electrolyte solid solute of molar mass 'M' $gmol^{-1}$ when dissolved in 100 mL water, decreases vapour pressure of water from 640 mm Hg to 600 mm Hg . If aqueous solution of the electrolyte boils at 375 K and K_b for water is $0.52\,K\,kg\,mol^{-1}$, then the mole fraction of the electrolyte solute $\left(x_2\right)$ in the solution can be expressed as

(Given : density of water $= 1\,g/mL$ and boiling point of water $= 373\,K$)

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(1) $\frac{2\cdot6}{16}\times\frac{M}{W}$ (2) $\frac{16}{2\cdot6}\times\frac{W}{M}$ (3) $\frac{1\cdot3}{8}\times\frac{M}{W}$ (4) $\frac{1\cdot3}{8}\times\frac{W}{M}$

Ans. Official answer NTA (4)

Sol.

Question ID : 444792582

56. $A \rightarrow D$ is an endothermic reaction occurring in three steps (elementary).

(i) $A \rightarrow B \Delta H_i = +ve$

(ii) $B \rightarrow C \Delta H_{ii} = -ve$

(iii) $C \rightarrow D \Delta H_{iii} = -ve$

Which of the following graphs between potential energy (y-axis) vs reaction coordinate (x-axis) correctly represents the reaction profile of $A \rightarrow D$?

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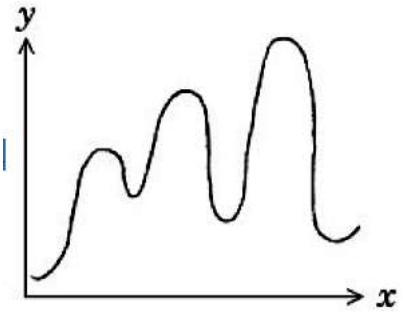
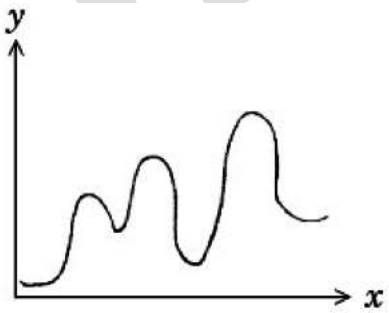
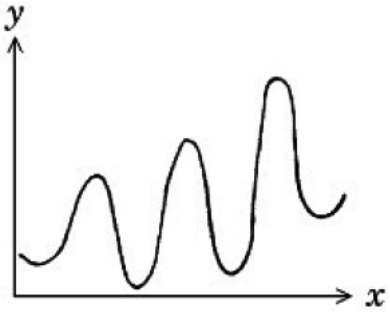
(1) 

(2) 

(3) 

(4) 

Ans. Official answer NTA (1)

Sol.

Question ID : 444792584

57. Among the following, the CORRECT combinations are

A. $IF_3 \rightarrow$ T-shaped $(sp^3 d)$

B. $IF_5 \rightarrow$ Square pyramidal $\left(sp^3 d^2\right)$

C. $IF_7 \rightarrow$ Pentagonal bipyramidal $\left(sp^3 d^3\right)$

D. $ClO_4^- \rightarrow$ Square planar $\left(sp^2 d\right)$

Choose the correct answer from the options given below:"

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

Ans. Official answer NTA (2)

Sol.

Question ID : 444792585

58. Given below are two statements:

Statement I: Hybridisation, shape and spin only magnetic moment of $K_3\left[Co\left(CO_3\right)_3\right]$ is $sp^3 d^2$, octahedral and 4.9 BM respectively.

Statement II: Geometry, hybridisation and spin only magnetic moment values (BM) of the ions $\left[Ni(CN)_4\right]^{2-}, \left[MnBr_4\right]^{2-}$ and $\left[CoF_6\right]^{3-}$ respectively are square planar, tetrahedral, octahedral; $dsp^2, sp^3, sp^3 d^2$ and $0, 5.9, 4.9$.

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

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

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

(3) Both Statement I and Statement II are false

(4) Both Statement I and Statement II are true"

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Ans. Official answer NTA (4)

Sol. Question ID : 444792590

59. Given below are two statements:

Statement I: '$C-Cl$' bond is stronger in $CH_2=CH-Cl$ than CH_3-CH_2-Cl

Statement II: The given optically active molecule, $Me^{Ph}_{Et}C-Cl$ on hydrolysis gives a solution that can rotate the plane polarized light.

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"

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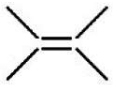
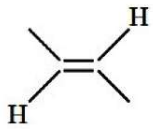
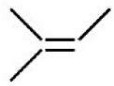
Ans. Official answer NTA (2)

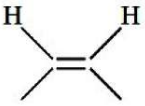
Sol. Question ID : 444792589

60. Arrange the following alkenes in decreasing order of stability.

I. 

II. 

III. 

IV. 

Choose the correct answer from the options given below:

(1) III > I > II > IV

(2) I > III > II > IV

(3) III > II > I > IV

(4) I > III > IV > II

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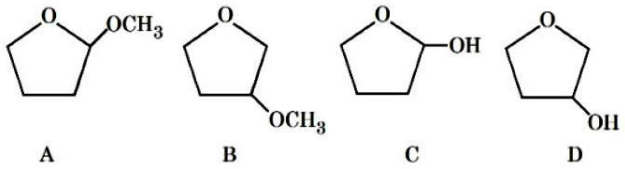
Ans. Official answer NTA (2)

Sol. Question ID : 444792587

61. A student is given one compound among the following compounds that gives positive test with Tollen's reagent.



A B C D

The compound is :

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

Ans. Official answer NTA (1)

Sol. Question ID : 444792578

62. Given below are statements about some molecules/ions.

Identify the CORRECT statements.

A. The dipole moment value of NF_3 is higher than that of NH_3.

B. The dipole moment value of BeH_2 is zero.

C. The bond order of O_2^{2-} and F_2 is same.

D. The formal charge on the central oxygen atom of ozone is -1 .

E. In NO_2 , all the three atoms satisfy the octet rule, hence it is very stable.

Choose the correct answer from the options given below:

(1) A, B, C, D & E

(2) A, C & D Only

(3) B & C Only

(4) B, C & D Only

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Ans. Official answer NTA (3)

Sol.

Question ID : 444792581

63. At $27^{\circ}C$ in presence of a catalyst, activation energy of a reaction is lowered by $10\,kJ\,mol^{-1}$. The logarithm of ratio of $\frac{k\ (catalysed)}{k\ (uncatalysed)}$ is....

(Consider that the frequency factor for both the reactions is same)

(1) 3.482

(2) 17.41

(3) 0.1741

(4) 1.741

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Ans. Official answer NTA (4)

Sol.

Question ID : 444792583

64. Given below are two statements:

Statement I: $K > Mg > Al > B$ is the correct order in terms of metallic character.

Statement II: Atomic radius is always greater than the ionic radius for any element.

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

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Ans. Official answer NTA (2)

Sol. Question ID : 444792577

65. Match the LIST-I with LIST-II

List-I	List-II
Isothermal process for ideal gas system	Work done ($V_f > V_i$)
A. Reversible expansion	I. $w = 0$
B. Free expansion	II. $w = -nRT \ln \frac{V_f}{V_i}$
C. Irreversible expansion	III. $w = -p_{ex}\left(V_f - V_i\right)$
D. Irreversible compression	IV. $w = -p_{ex}\left(V_i - V_f\right)$

Choose the correct answer from the options given below:

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

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

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

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

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Ans. Official answer NTA (3)

Sol.

Question ID : 444792595

66. Consider three metal chlorides x, y and z, where x is water soluble at room temperature, y is sparingly soluble in water at room temperature and z is soluble in hot water. x, y and z are respectively

(1) $AlCl_3, PbCl_2$ and $BaCl_2$

(2) $AgCl, Hg_2Cl_2$ and $PbCl_2$

(3) $CuCl_2, AgCl$ and $PbCl_2$

(4) $MgCl_2, AgCl$ and $AlCl_3$

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Ans. Official answer NTA (3)

Sol.

Question ID : 444792586

67. Given below are two statements:

Statement I: The number of paramagnetic species among $[CoF_6]^{3-}$, $[TiF_6]^{3-}$, V_2O_5 and $[Fe(CN)_6]^{3-}$ is

Statement II: $K_4[Fe(CN)_6] < K_3[Fe(CN)_6] < [Fe(H_2O)_6]SO_4 \cdot H_2O < [Fe(H_2O)_6]Cl_3$ is the correct order in terms of number of unpaired electron(s) present in the complexes.

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

(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

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Ans. Official answer NTA (4)

Sol.

Question ID : 444792594

68. A hydroxy compound (X) with molar mass $122\,g\,mol^{-1}$ is acetylated with acetic anhydride, using a large excess of the reagent ensuring complete acetylation of all hydroxyl groups. The product obtained has a molar mass of $290\,g\,mol^{-1}$. The number of hydroxyl groups present in compound (X) is:

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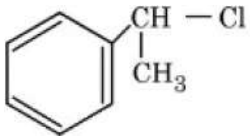
(1) 5 (2) 2 (3) 4 (4) 3

Ans. Official answer NTA (3)

Sol.

Question ID : 444792591

69. Match the LIST-I with LIST-II

List-I Chloro derivative	List-II Example
A. Vinyl Chloride	I. $CH_2=CH-CH_2Cl$
B. Benzyl Chloride	II. $CH_3-CH(Cl)CH_3$
C. Alkyl Chloride	III. $CH_2=CHCl$
D. Allyl Chloride	IV. 

Choose the correct answer from the options given below:

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

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

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

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

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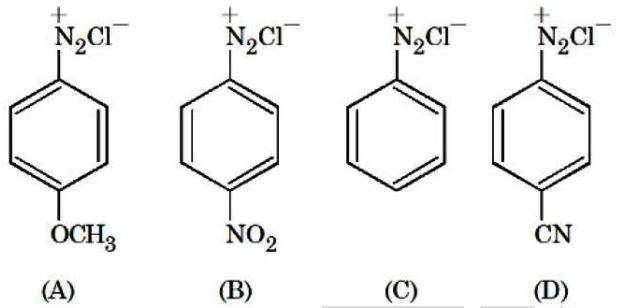
Ans. Official answer NTA (2)

Sol.

Question ID : 444792593

70. The correct stability order of the following diazonium salts is



(A) (B) (C) (D)

(1) C > A > D > B

(2) A > B > C > D

(3) C > D > B > A

(4) A > C > D > B

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Ans. Official answer NTA (4)

Sol.

SECTION – B

Question ID : 444792598

71. The hydrogen spectrum consists of several spectral lines in Lyman series $(L_1, L_2, L_3 \ldots; L_1$ has lowest energy among Lyman series). Similarly it consists of several spectral lines in Balmer series $(B_1, B_2, B_3 \ldots; B_1$ has lowest energy among Balmer lines). The energy of L_1 is x times the energy of B_1. The value of x is ____$\times 10^{-1}$.

(Nearest integer)

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Ans. Official answer NTA (54)

Sol.

Question ID : **444792597**

72. In Dumas method for estimation of nitrogen, 0.50 g of an organic compound gave 70 mL of nitrogen collected at 300 K and 715 mm pressure. The percentage of nitrogen in the organic compound is _____%.

(Aqueous tension at 300 K is 15 mm).

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Ans. Official answer NTA (15)

Sol.

Question ID : 444792599

73. Consider two Group IV metal ions X^{2+} and Y^{2+}.

A solution containing $0.01MX^{2+}$ and $0.01MY^{2+}$ is saturated with H_2S. The pH at which the metal sulphide YS will form as a precipitate is _____. (Nearest integer)

(Given: $K_{sp}(XS)=1\times10^{-22}$ at $25^{\circ}C, K_{sp}(YS)=4\times10^{-16}$ at $25^{\circ}C$, $[H_2S]=0.1M$ in solution, $K_{a1}\times K_{a2}(H_2S)=1.0\times10^{-21}, \log 2=0.30, \log 3=0.48, \log 5=0.70$)

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Ans. Official answer NTA (4)

Sol.

Question ID : 444792600

74. Electricity is passed through an acidic solution of Cu^{2+} till all the Cu^{2+} was exhausted, leading to the deposition of 300 mg of Cu metal. However, a current of 600 mA was continued to pass through the same solution for another 28 minutes by keeping the total volume of the solution fixed at 200 mL. The total volume of oxygen evolved at STP during the entire process is _____mL.

(Nearest integer)

[Given: $Cu^{2+}(aq)+2e^{-}\rightarrow Cu(s) E^{0}_{red}=+0.34\,V$

$O_2(g)+4H^{+}+4e^{-}\rightarrow 2H_2O E^{0}_{red}=+1.23\,V$

Molar mass of $Cu=63.54\,g\,mol^{-1}$

Molar mass of $O_2 = 32\,g\,mol^{-1}$

Faraday Constant $= 96500 C mol^{-1}$

Molar volume at $STP = 22.4\,L$]

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Ans. Official answer NTA (111)

Sol.

Question ID : 444792596

75. X and Y are the number of electrons involved, respectively during the oxidation of I^- to I_2 and S^{2-} to S by acidified $K_2Cr_2O_7$. The value of $X + Y$ is _____ .

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Ans. Official answer NTA (12)

Sol.