

JEE Main January 2026
Question Paper With Text Solution
22 January | Shift-2

CHEMISTRY



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

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JEE MAIN JANUARY 2026 | 28 JANUARY SHIFT-2**SECTION - A**

Question ID : 8606541034

51. Given below are two statements :

Statement I: Elements 'X' and 'Y' are the most and least electronegative elements, respectively among N, As, Sb and P. The nature of the oxides X_2O_3 and Y_2O_3 is acidic and amphoteric, respectively.

Statement II: BCl_3 is covalent in nature and gets hydrolysed in water. It produces $[B(OH)_4]^-$ and $[B(H_2O)_6]^{3+}$ in aqueous medium.

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

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- (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 : 8606541028

52. At T(K), 100 g of 98% H_2SO_4 (w/w) aqueous solution is mixed with 100 g of 49% H_2SO_4 (w/w) aqueous solution. What is the mole fraction of H_2SO_4 in the resultant solution?

(Given : Atomic mass H = 1u; S = 32u; O = 16u).

(Assume that temperature after mixing remains constant)

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- (1) 0.663
- (2) 0.1
- (3) 0.9
- (4) 0.337

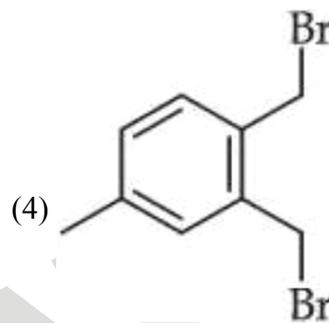
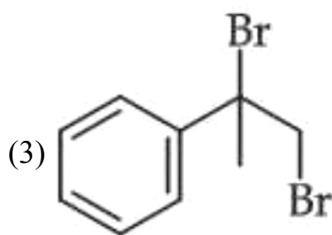
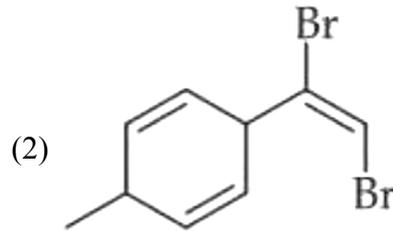
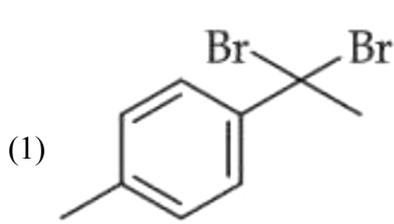
Ans. Official answer NTA (4)**Sol.**

Question ID : 8606541041

53. The dibromo compound [P] (molecular formula : $C_9H_{10}Br_2$) when heated with excess sodamide followed by treatment with dilute HCl gives [Q]. On warming [Q] with mercuric sulphate and dilute sulphuric acid yield [R] which gives positive Iodoform test but negative Tollen's test. The compound [P] is :



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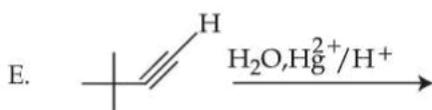
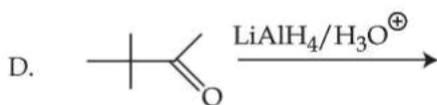
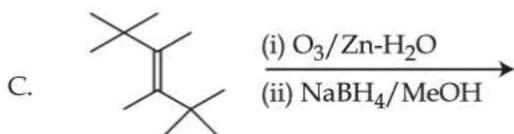
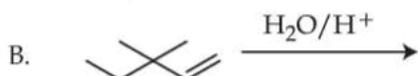
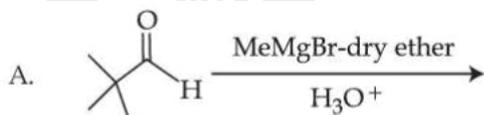


Ans. Official answer NTA (1)

Sol.

Question ID : 8606541043

54. 3,3-Dimethyl-2-butanol cannot be prepared by :



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Choose the correct answer from the options given below :

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

Ans. Official answer NTA (1)

Sol.

Question ID : 8606541029

55. Which of the following mixture gives a buffer solution with $\text{pH} = 9.25$?

Given : $\text{pK}_b(\text{NH}_4\text{OH}) = 4.75$

- (1) $0.2\text{MNH}_4\text{OH}(0.5\text{L}) + 0.1\text{MHCl}(0.5\text{L})$
(2) $0.2\text{MNH}_4\text{OH}(0.4\text{L}) + 0.1\text{MHCl}(1\text{L})$
(3) $0.5\text{MNH}_4\text{OH}(0.2\text{L}) + 0.2\text{MHCl}(0.5\text{L})$
(4) $0.4\text{MNH}_4\text{OH}(1\text{L}) + 0.1\text{MHCl}(1\text{L})$

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Ans. Official answer NTA (1)

Sol.

Question ID : 8606541036

56. $[\text{Ni}(\text{PPh}_3)_2\text{Cl}_2]$ is a paramagnetic complex. Identify the INCORRECT statements about this complex.

- A. The complex exhibits geometrical isomerism.
B. The complex is white in colour.
C. The calculated spin-only magnetic moment of the complex is 2.84 BM .
D. The calculated CFSE (Crystal Field Stabilization Energy) of Ni in this complex is $-0.8\Delta_0$.
E. The geometrical arrangement of ligands in this complex is similar to that in $\text{Ni}(\text{CO})_4$.

Choose the correct answer from the options given below :

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

Ans. Official answer NTA (1)

Sol.

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Question ID : 8606541033

57. Given below are two statements :

 Statement I : $C < O < N < F$ is the correct order in terms of first ionization enthalpy values.

 Statement II: $S > Se > Te > Po > O$ is the correct order in terms of the magnitude of electron gain enthalpy values.

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

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- (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

Ans. Official answer NTA (1)

Sol.

Question ID : 8606541042

 58. The compound A, $C_8H_8O_2$ reacts with acetophenone to form a single product via cross-Aldol condensation. The compound A on reaction with conc. NaOH forms a substituted benzyl alcohol as one of the two products. The compound A is :

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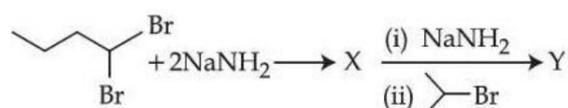
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|----------------------------|------------------------------|
| (1) 4-methoxy benzaldehyde | (2) 4-hydroxy benzylaldehyde |
| (3) 4-methyl benzoic acid | (4) 2-hydroxy acetophenone |

Ans. Official answer NTA (1)

Sol.

Question ID : 8606541040

59. Consider the following reaction :



The product Y formed is :

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- | | |
|------------------------|-----------------------|
| (1) 2-methylhex-2-yne | (2) 2-methylhex-3-yne |
| (3) Isopropylbut-1-yne | (4) 5-methylhex-2-yne |

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Ans. Official answer NTA (2)

Sol. Question ID : 8606541027

60. The energy of first (lowest) Balmer line of H atom is x J. The energy (in J) of second Balmer line of H atom is :

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- (1) $1.35x$ (2) $\frac{x}{1.35}$ (3) x^2 (4) $2x$

Ans. Official answer NTA (1)

Sol.

Question ID : 8606541032

61. Among H_2S , H_2O , NF_3 , NH_3 and $CHCl_3$, identify the molecule (X) with lowest dipole moment value. The number of lone pairs of electrons present on the central atom of the molecule (X) is :

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- (1) 1 (2) 2 (3) 3 (4) 0

Ans. Official answer NTA (1)

Sol.

Question ID : 8606541037

62. Identify the correct statements :

- A. Hydrated salts can be used as primary standard.
- B. Primary standard should not undergo any reaction with air.
- C. Reactions of primary standard with another substance should be instantaneous and stoichiometric.
- D. Primary standard should not be soluble in water.
- E. Primary standard should have low relative molar mass.

Choose the correct answer from the options given below :

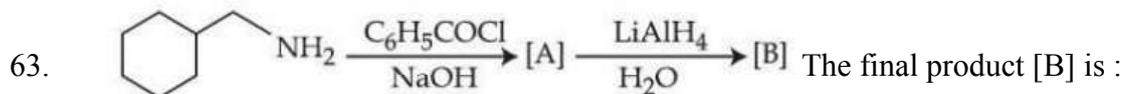
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- (1) A, B and C Only
(2) A, B, C and E Only
(3) D and E Only
(4) A, B and E Only

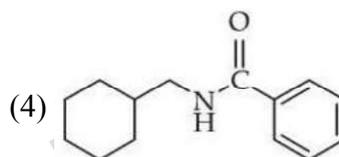
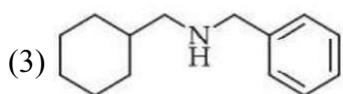
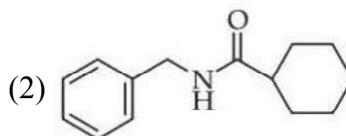
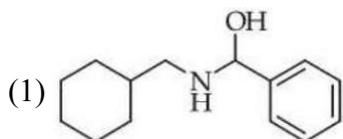
Ans. Official answer NTA (1)

**Sol.**

Question ID : 8606541044



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**Ans.** Official answer NTA (3)**Sol.**

Question ID : 8606541031

64. Correct statements regarding Arrhenius equation among the following are :

- A. Factor $e^{-E_a/RT}$ corresponds to fraction of molecules having kinetic energy less than E_a .
B. At a given temperature, lower the E_a , faster is the reaction.
C. Increase in temperature by about 10°C doubles the rate of reaction.
D. Plot of $\log k$ vs $\frac{1}{T}$ gives a straight line with slope $= -\frac{E_a}{R}$.

Choose the correct answer from the options given below :

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

Ans. Official answer NTA (2)**Sol.**

Question ID : 8606541035

65. Given below are two statements :

Statement I : The first ionization enthalpy of Cr is lower than that of Mn .

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Statement II: The second and third ionization enthalpies of Cr are higher than those of Mn .

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

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- (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 : 8606541045

66. List - I

Reaction of Glucose with

- A. Hydroxylamine
- B. Br₂ water
- C. Excess acetic anhydride
- D. Concentrated HNO₃

List - II

Product formed

- I. Gluconic acid
- II. Glucose pentacetate
- III. Saccharic acid
- IV. Glucosime

Choose the correct answer from the options given below :

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

Ans. Official answer NTA (4)

Sol.

Question ID : 8606541026

67. $A + 2B \rightarrow AB_2$

36.0 g of 'A' (Molar mass : 60 g mol^{-1}) and 56.0 g of 'B' (Molar mass : 80 g mol^{-1}) are allowed to react.

Which of the following statements are correct ?

A. 'A' is the limiting reagent.

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- B. 77.0 g of AB_2 is formed.
- C. Molar mass of AB_2 is 140 g mol^{-1} .
- D. 15.0 g of A is left unreacted after the completion of reaction.

Choose the correct answer from the options given below :“

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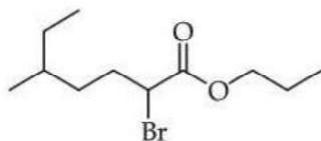
- (1) B and D Only
- (2) A and B Only
- (3) A and C Only
- (4) C and D Only

Ans. Official answer NTA (1)

Sol.

Question ID : 8606541039

68. The IUPAC name of the following compound is :



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- (1) n-propyl-2-bromo-5-methylheptanoate
- (2) 2-bromo-5-methylhexylpropanoate
- (3) n-propyl-1-bromo-4-methylhexanoate
- (4) 2-bromo-5-methylpropanoate

Ans. Official answer NTA (1)

Sol.

Question ID : 8606541038

69. When 1 g of compound (X) is subjected to Kjeldahl's method for estimation of nitrogen, 15 mL 1 M H_2SO_4 was neutralized by ammonia evolved. The percentage of nitrogen in compound (X) is :

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- (1) 0.42 (2) 0.21 (3) 21 (4) 42

Ans. Official answer NTA (4)

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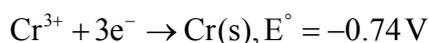
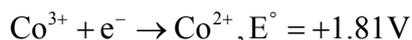
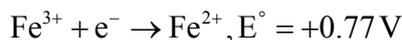
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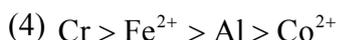
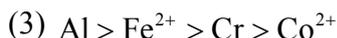
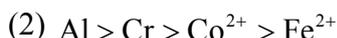
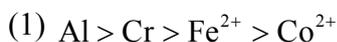
Question ID : 8606541030

70. Consider the following reduction processes :



The tendency to act as reducing agent decreases in the

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**Ans.** Official answer NTA (1)**Sol.****SECTION - B**

Question ID : 8606541048

71. Consider $\text{A} \xrightarrow{k_1} \text{B}$ and $\text{C} \xrightarrow{k_2} \text{D}$ are two reactions. If the rate constant (k_1) of the $\text{A} \rightarrow \text{B}$ reactioncan be expressed by the following equation $\log_{10} k = 14.34 - \frac{1.5 \times 10^4}{T/K}$ and activation energy of $\text{C} \rightarrow \text{D}$ reaction (E_{a_2}) is $\frac{1}{5}$ th of the $\text{A} \rightarrow \text{B}$ reaction (E_{a_1}), then the value of (E_{a_2}) is _____ kJmol^{-1} .

(Nearest Integer)

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Ans. Official answer NTA (57)**Sol.**

Question ID : 8606541047

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72. 72 Consider the following electrochemical cell : $\text{Pt}|\text{O}_2(\text{g})(1\text{bar})|\text{HCl}(\text{aq})||\text{M}^{2+}(\text{aq},1.0\text{M})|\text{M}(\text{s})$

The pH above which, oxygen gas would start to evolve at anode is _____ (nearest integer).

[Given: $E^\circ_{\text{M}^{2+}/\text{M}} = 0.994\text{ V}$
 $E^\circ_{\text{O}_2/\text{H}_2\text{O}} = 1.23\text{ V}$ } standard reduction potential

and $\frac{RT}{F}(2.303) = 0.059\text{V}$ at the given condition]

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Ans. Official answer NTA (4)

Sol.

Question ID : **8606541049**

73. Among the following oxides of 3 d elements, the number of mixed oxides are _____. $\text{Ti}_2\text{O}_3, \text{V}_2\text{O}_4, \text{Cr}_2\text{O}_3, \text{Mn}_3\text{O}_4, \text{Fe}_3\text{O}_4, \text{Fe}_2\text{O}_3, \text{Co}_3\text{O}_4$

क

Ans. Official answer NTA (3)

Sol.

Question ID : **8606541050**

74. The mass of benzanilide obtained from the benzoylation reaction of 5.8 g of aniline, if yield of product is 82%, is _____ g (nearest integer).

(Given molar mass in g mol^{-1} H:1, C:12, N:14, O:16)

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Ans. Official answer NTA (10)

Sol.

Question ID : 8606541046

75. If the enthalpy of sublimation of Li is 155 kJ mol^{-1} , enthalpy of dissociation of F_2 is 150 kJ mol^{-1} , ionization enthalpy of Li is 520 kJ mol^{-1} , electron gain enthalpy of F is -313 kJ mol^{-1} , standard enthalpy of formation of LiF is -594 kJ mol^{-1} . The magnitude of lattice enthalpy of LiF is _____ kJ mol^{-1} . (Nearest Integer)

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Ans. Official answer NTA (1034)

Sol.

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