

**JEE Main January 2026**  
**Question Paper With Text Solution**  
**28 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 : 8606541713

51. Identify the correct statements :

The presence of  $-\text{NO}_2$  group in benzene ring

- A. activates the ring towards electrophilic substitutions.  
B. deactivates the ring towards electrophilic substitutions.  
C. activates the ring towards nucleophilic substitutions.  
D. deactivates the ring towards nucleophilic substitutions.

Choose the correct answer from the options given below :

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

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

Question ID : 8606541720

52. A student has been given 0.314 g of an organic compound and asked to estimate Sulphur. During the experiment, the student has obtained 0.4813 g of barium sulphate. The percentage of sulphur present in the compound is \_\_\_\_\_ (Given Molar mass in  $\text{gmol}^{-1}$  S : 32,  $\text{BaSO}_4$  : 233)

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- (1) 65.15%      (2) 21.05%      (3) 48.24%      (4) 42.10%

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

Question ID : 8606541717

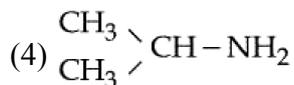
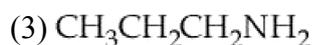
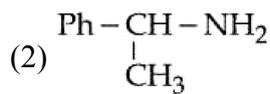
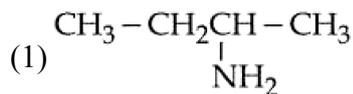
53. A student performed analysis of aliphatic organic compound 'X' which on analysis gave C = 61.01%, H = 15.25%, N = 23.74%.

This compound, on treatment with  $\text{HNO}_2/\text{H}_2\text{O}$  produced another compound 'Y' which did not contain any nitrogen atom. However, the compound 'Y' upon controlled oxidation produced another compound 'Z' that responded to iodoform test.

The structure of 'X' is :

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

**Sol.**

Question ID : 8606541708

54. Given below are two statements :

Statement I : The increasing order of boiling point of hydrogen halides is  $\text{HCl} < \text{HBr} < \text{HI} < \text{HF}$ .

Statement II : The increasing order of melting point of hydrogen halides is  $\text{HCl} < \text{HBr} < \text{HF} < \text{HI}$ .

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

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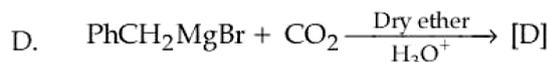
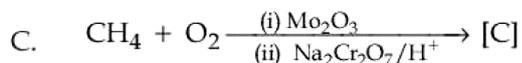
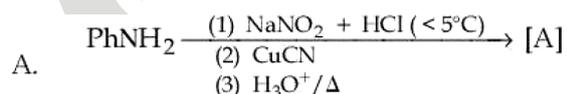
- (1) Statement I is false but Statement II is true  
 (2) Both Statement I and Statement II are false  
 (3) Statement I is true but Statement II is false  
 (4) Both Statement I and Statement II are true

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

**Sol.**

Question ID : 8606541716

55. The correct order of acidic strength of the major products formed in the given reactions, is :



Choose the correct answer from the options given below :

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- (1)  $A > D > C > B$     (2)  $C > A > D > B$     (3)  $C > B > A > D$     (4)  $A > D > B > C$

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

**Sol.**

Question ID : 8606541704

56. Consider the following aqueous solutions.

I. 2.2 g Glucose in 125 mL of solution.

II. 1.9 g Calcium chloride in 250 mL of solution.

III. 9.0 g Urea in 500 mL of solution.

IV. 20.5 g Aluminium sulphate in 750 mL of solution.

The correct increasing order of boiling point of these solutions will be :

[Given : Molar mass in  $\text{g mol}^{-1}$  :  $H = 1, C = 12, N = 14, O = 16, Cl = 35.5, Ca = 40, Al = 27$  and  $S = 32$ 

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(1)  $II < III < IV < I$     (2)  $I < II < III < IV$     (3)  $III < I < II < IV$     (4)  $II < III < I < IV$ **Ans.** Official answer NTA (2)**Sol.**

Question ID : 8606541709

57. Consider the following statements about manganate and permanganate ions. Identify the correct statements.

A. The geometry of both manganate and permanganate ions is tetrahedral.

B. The oxidation states of Mn in manganate and permanganate are +7 and +6, respectively.

C. Oxidation of Mn (II) salt by peroxodisulphate gives manganate ion as the final product.

D. Manganate ion is paramagnetic and permanganate ions is diamagnetic.

E. Acidified permanganate ion reduces oxalate, nitrite and iodide ions.

Choose the correct answer from the options given below :

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

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

Question ID : 8606541718



58. Total number of alkali insoluble solid sulphonamides obtained by reaction of given amines with Hinsberg's reagent is \_\_\_\_\_ .

Aniline, N-Methylaniline, Methanamine, N, N-Dimethylmethanamine, N-Methyl methanamine, Phenylmethanamine, N-propylaniline, N-phenylaniline, N, N-Dimethylaniline, Allyl amine, Isopropyl amine

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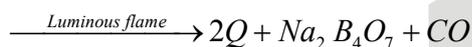
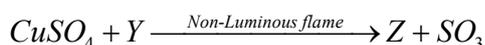
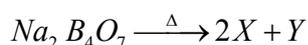
- (1) 2                      (2) 4                      (3) 8                      (4) 5

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

**Sol.**

Question ID : 8606541711

59. Consider the following reactions



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- (1) +2 and +1              (2) +1 and +2              (3) +1 and +1              (4) +2 and +2

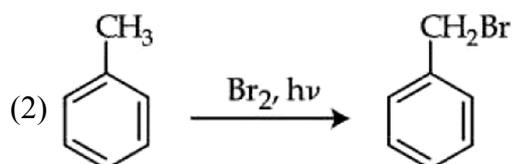
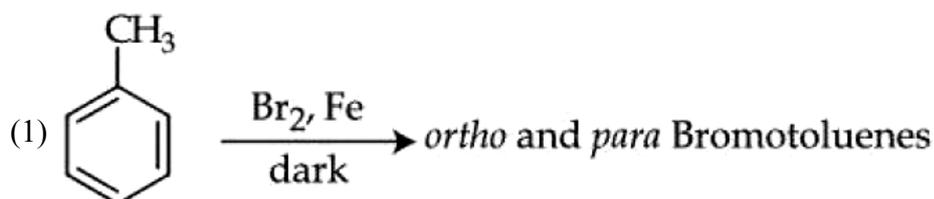
**Ans.** Official answer NTA (1)

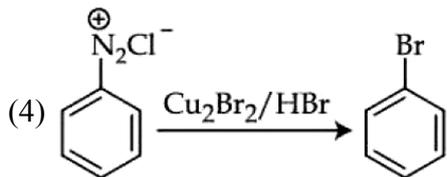
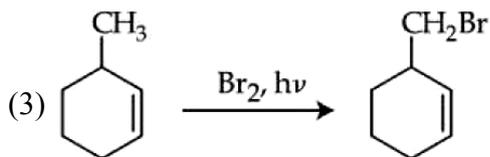
**Sol.**

Question ID : 8606541715

60. Which of the following reaction is NOT correctly represented?

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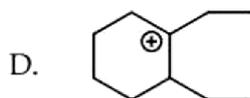
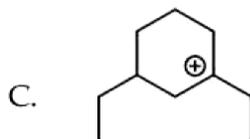
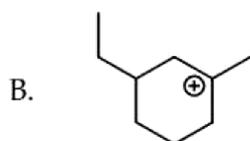
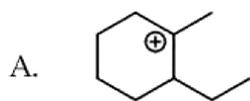


**Ans.** Official answer NTA (3)

**Sol.**

Question ID : 8606541712

61. The cyclic cations having the same number of hyperconjugation are :



Choose the correct answer from the options given below :

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

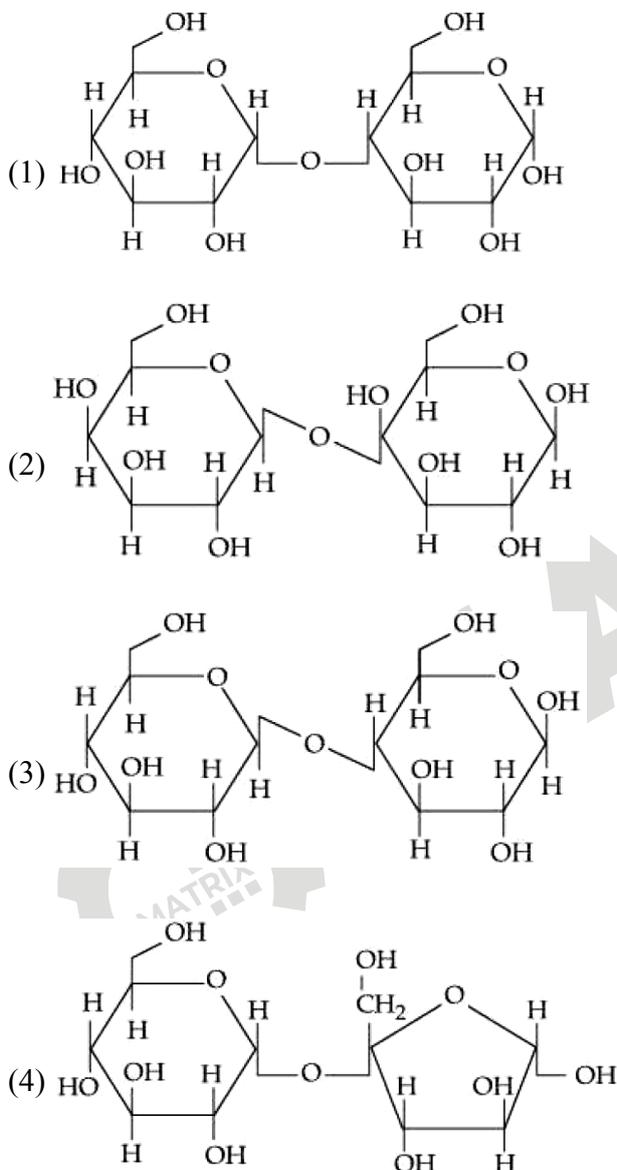
**Ans.** Official answer NTA (3)

**Sol.**

Question ID : 8606541719

62. Structures of four disaccharides are given below. Among the given disaccharides, the non-reducing sugar is :

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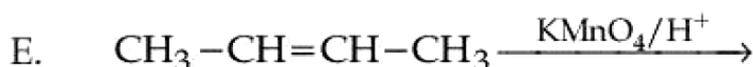
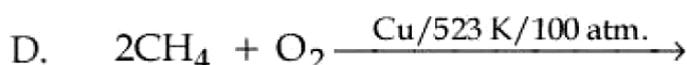
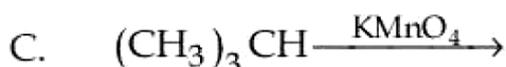
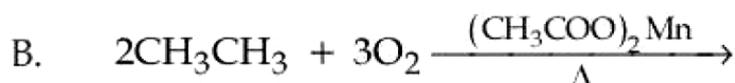
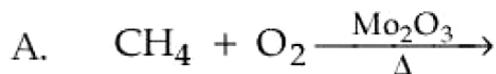
**Ans.** Official answer NTA (4)

**Sol.**

Question ID : 8606541714



63. The reactions which produce alcohol as the product are :



Choose the correct answer from the options given below :

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

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

**Sol.**

Question ID : 8606541707

64. Consider the elements N, P, O, S, Cl and F. The number of valence electrons present in the elements with most and least metallic character from the above list is respectively.

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(1) 5 and 6 (2) 7 and 5 (3) 5 and 7 (4) 6 and 7

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

**Sol.**

Question ID : 8606541705

65. The correct increasing order of spin-only magnetic moment values of the complex ions

$[\text{MnBr}_4]^{2-}$  (A),  $[\text{Cu}(\text{H}_2\text{O})_6]^{2+}$  (B),  $[\text{Ni}(\text{CN})_4]^{2-}$  (C) and  $[\text{Ni}(\text{H}_2\text{O})_6]^{2+}$  (D) is :

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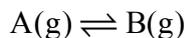
(1)  $C = D < B < A$  (2)  $A = B < D < C$  (3)  $C < B < D < A$  (4)  $A = B < C < D$

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

**Sol.**

Question ID : 8606541705

66. Observe the following equilibrium in a 1 L flask.



At T(K), the equilibrium concentrations of A and B are 0.5 M and 0.375 M respectively. 0.1 moles of A is added into the flask and heated to T(K) to establish the equilibrium again. The new equilibrium concentrations (in M) of A and B are respectively

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- (1) 0.367, 0.275      (2) 0.742, 0.557      (3) 0.53, 0.4      (4) 0.557, 0.418

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

Question ID : 8606541702

67. The wavelength of photon 'A' is 400 nm. The frequency of photon 'B' is  $10^{16} \text{ s}^{-1}$ . The wave number of photon 'C' is  $10^4 \text{ cm}^{-1}$ . The correct order of energy of these photons is :

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- (1)  $C > B > A$       (2)  $A > C > B$       (3)  $B > A > C$       (4)  $A > B > C$

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

Question ID : 8606541706

68. Match List - I with List - II according to shape.

**List - I**

- A.  $\text{XeO}_3$   
B.  $\text{XeF}_2$   
C.  $\text{XeO}_2\text{F}_2$   
D.  $\text{XeOF}_4$

**List - II**

- I.  $\text{BrF}_5$   
II.  $\text{NH}_3$   
III.  $[\text{I}_3]^-$   
IV.  $\text{SF}_4$

Choose the correct answer from the options given below :

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

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

Question ID : 8606541703

69. The plot of  $\log_{10} K$  vs  $\frac{1}{T}$  gives a straight line. The intercept and slope respectively are (where K is equilibrium constant).

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$$(1) -\frac{\Delta H^\circ}{2 \cdot 303R}, \frac{\Delta S^\circ}{2 \cdot 303R}$$

$$(2) \frac{\Delta S^\circ}{2 \cdot 303R}, -\frac{\Delta H^\circ}{2 \cdot 303R}$$

$$(3) -\frac{\Delta S^\circ R}{2 \cdot 303}, \frac{\Delta H^\circ R}{2 \cdot 303}$$

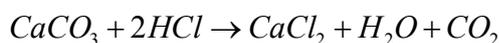
$$(4) \frac{2 \cdot 303R}{\Delta H^\circ}, \frac{2 \cdot 303R}{\Delta S^\circ}$$

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

**Sol.**

Question ID : 8606541701

70. For the given reaction;



If 90 g  $CaCO_3$  is added to 300 mL of HCl which contains 38.55% HCl by mass and has density  $1.13 \text{ g mL}^{-1}$ , then which of the following option is correct ?

Given molar mass of H, Cl Ca and O are 1, 35.5, 40 and  $16 \text{ g mol}^{-1}$  respectively.

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(1) 64.97 g of HCl remains unreacted

(2) 97.30 g of HCl reacted

(3) 60.32 g of HCl remains unreacted

(4) 32.85 g of  $CaCO_3$  remains unreacted

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

**Sol.**

### SECTION - B

Question ID : 8606541725

71. The number of isoelectronic species among  $Sc^{3+}$ ,  $Cr^{2+}$ ,  $Mn^{3+}$ ,  $Co^{3+}$  and  $Fe^{3+}$  is 'n'. If 'n' moles of AgCl is formed during the reaction of complex with formula  $CoCl_3(en)_2NH_3$  with excess of  $AgNO_3$  solution, then the number of electrons present in the  $t_{2g}$  orbital of the complex is \_\_\_\_\_.

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**Ans.** Official answer NTA (6)

**Sol.**

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Question ID : 8606541722

72. For strong electrolyte  $\Lambda_m$  increases slowly with dilution and can be represented by the equation

$$\Lambda_m = \Lambda_m^\circ - Ac^{1/2}$$

Molar conductivity values of the solutions of strong electrolyte AB at  $18^\circ\text{C}$  are given below :

$c$ [mol L <sup>-1</sup> ]	0.04	0.09	0.16	0.25
$\Lambda_m$ [S cm <sup>2</sup> mol <sup>-1</sup> ]	96.1	95.7	95.3	94.9

The value of constant A based on the above data [ in  $\text{Scm}^2 \text{mol}^{-1} / (\text{mol} / \text{L})^{1/2}$  ] unit is \_\_\_\_ .

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

Question ID : 8606541723

73. A volume of  $x \text{ mL}$  of  $5\text{MNaHCO}_3$  solution was mixed with  $10 \text{ mL}$  of  $2\text{MH}_2\text{CO}_3$  solution to make an electrolytic buffer. If the same buffer was used in the following electrochemical cell to record a cell potential of  $235.3 \text{ mV}$  , then the value of  $x =$  \_\_\_\_\_ mL (nearest integer).

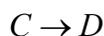
Consider upto one place of decimal for intermediate calculations

$$\left[ \begin{array}{l} \text{Given :} \quad E^\circ_{\text{HSnO}_2^- | \text{Sn}(\text{OH})_6^{2-}} = -0.9 \text{ V} \\ E^\circ_{\text{Bi}_2\text{O}_3 | \text{Bi}} = -0.44 \text{ V} \\ \text{pK}_a(\text{H}_2\text{CO}_3) = 6.11 \\ \frac{2.303 RT}{F} = 0.059 \text{ V} \\ \text{Antilog}(1.29) = 19.5 \end{array} \right]$$

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**Ans.** Official answer NTA (78)**Sol.**

Question ID : 8606541724



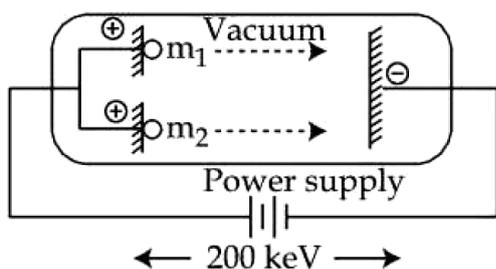
Consider the above two first-order reactions. The rate constant for first reaction at 500 K is double of the same at 300 K. At 500 K, 50% of the reaction becomes complete in 2 hour. The activation energy of the second reaction is half of that of first reaction. If the rate constant at 500 K of the second reaction becomes double of the rate constant of first reaction at the same temperature; then rate constant for the second reaction at 300 K is \_\_\_\_\_  $\times 10^{-1}$  hour<sup>-1</sup> (nearest integer).

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**Ans.** Official answer NTA (5)

**Sol.**

Question ID : 8606541721

 75. Two positively charged particles  $m_1$  and  $m_2$  have been accelerated across the same potential difference of 200 keV as shown below.

 [Given mass of  $m_1 = 1$  amu and  $m_2 = 4$  amu]

 The deBroglie wavelength of  $m_1$  will be  $x$  times of  $m_2$ . The value of  $x$  is \_\_\_\_\_ (nearest integer)

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

**Sol.**