

# JEE Main 2024 Chemistry Question Paper April 4 Shift 1

Time Allowed :3 Hours	Maximum Marks :300	Total Questions :90
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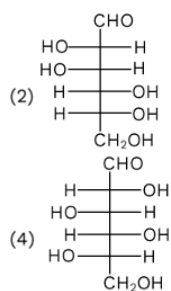
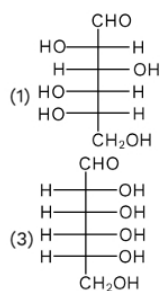
## General Instructions

Read the following instructions very carefully and strictly follow them:

1. The test is of 3 hours duration.
2. The question paper consists of 90 questions, out of which 75 are to attempted. The maximum marks are 300.
3. There are three parts in the question paper consisting of Physics, Chemistry and Mathematics having 30 questions in each part of equal weightage.
4. Each part (subject) has two sections.
  - (i) Section-A: This section contains 20 multiple choice questions which have only one correct answer. Each question carries 4 marks for correct answer and -1 mark for wrong answer.
  - (ii) Section-B: This section contains 10 questions. In Section-B, attempt any five questions out of 10. The answer to each of the questions is a numerical value. Each question carries 4 marks for correct answer and -1 mark for wrong answer. For Section-B, the answer should be rounded off to the nearest integer

## Chemistry

1. Which of the following is the correct structure of L-Glucose?



2. How many structural isomers are there in  $C_7H_{16}$ ?

- (1) 5
- (2) 6
- (3) 8
- (4) 9

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3. Which of the following has the maximum dipole moment?

- (1) NH<sub>3</sub>
- (2) NF<sub>3</sub>
- (3) PCl<sub>5</sub>
- (4) CH<sub>4</sub>

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4. Which of the following shows only one oxidation state except its elemental state?

- (1) Ti
- (2) Sc
- (3) Co
- (4) Ni

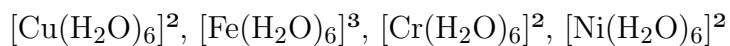
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5. Number of species having sp<sup>3</sup> hybridised central atom.

- (1) NO<sup>-</sup>
- (2) BCl<sub>3</sub>
- (3) ClO<sup>-</sup>
- (4) ClO<sub>3</sub><sup>-</sup>

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6. Number of complexes having even number of unpaired electrons in d-orbital.



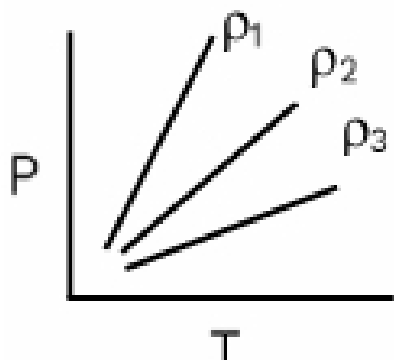
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7. If emf of hydrogen electrode at 25°C is zero in pure water then pressure of H<sub>2</sub> in bar

- (1) 10<sup>-14</sup>
- (2) 10<sup>-7</sup>

- (3) 1  
 (4) 0.5

8. Pressure v/s temperature graph of an ideal gas of equal number of moles of different density is given below:



- (1)  $\rho_1 = \rho_2 = \rho_3$   
 (2)  $\rho_1 > \rho_2 > \rho_3$   
 (3)  $\rho_1 < \rho_2 < \rho_3$   
 (4)  $\rho_1 > \rho_2 < \rho_3$

9. Total number of species having single unpaired electron in  $\text{NO}^-$ ,  $\text{CN}^-$ ,  $\text{O}_2^-$ ,  $\text{O}_2$ ,  $\text{O}_2^{2-}$ .

10. Which of the following is the correct order of 1st ionisation enthalpy?

- (1) B  $\uparrow$  Be  $\uparrow$  O  $\uparrow$  F  $\uparrow$  N  
 (2) B  $\downarrow$  Be  $\downarrow$  O  $\downarrow$  F  $\downarrow$  N  
 (3) B  $\downarrow$  Be  $\downarrow$  N  $\downarrow$  F  $\downarrow$  O  
 (4) Be  $\downarrow$  B  $\downarrow$  N  $\downarrow$  F  $\downarrow$  O

11. For any reaction  $K = \frac{K_1 K_2}{K_3}$  and  $E_{a1} = 400$ ,  $E_{a2} = 300$ ,  $E_{a3} = 200$ , hence  $E_{\text{overall}}$ ?

- (1) 400
  - (2) 200
  - (3) 500
  - (4) 600
- 

12. If weight of NaCl in 500 ml aqueous solution is 5.85 gm, hence calculate the molarity?

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13. 2M, 2 ml solution of  $\text{KMnO}_4$  is neutralised with 20 ml  $\text{H}_2\text{C}_2\text{O}_4$ . Calculate molarity of  $\text{H}_2\text{C}_2\text{O}_4$

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14. De-Broglie wavelength of electron in the 4<sup>th</sup> orbit of H-Atom is  $x\pi r_0$ , where  $r_0$  is Bohr's 1<sup>st</sup> orbit radius of H-Atom is

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15. Among which of the following decreasing order of basic strength will be (i)  $\text{OH}^-$ , (ii)  $\text{H}^-$ , (iii)  $\text{HCOO}^-$ , (iv)  $\text{CH}_3\text{COO}^-$ , (v)  $-\text{OR}$

- (1) II > V > II > I > IV
  - (2) II > V > I > III > IV
  - (3) III > VI > I > V > II
  - (4) V > I > VI > II > III
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16. What type of electrode is calomel?

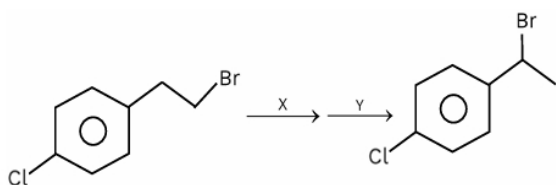
- (1) Redox electrode
- (2) Metal-metal insoluble salt-its anion
- (3) Gas-ion
- (4) Metal-metal ion

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17. Total number of elements which do not use all valence electrons in bonding as per their group number among them O, S, F, N, Al, C, Si

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18. Identify the suitable reagents X and Y for the given below reaction respectively.



- (1) dil. NaOH/20°C; HBr/CHCOOH
  - (2) dil. NaOH/20°C; Br/CHCOOH
  - (3) Alcoholic NaOH/80°C; HBr/CHCOOH
  - (4) Alcoholic NaOH/80°C; HBr/Peroxide
- 

19. Compare ligand strength of  $F^-$ ,  $OH^-$ ,  $SCN^-$ , CO

- (1)  $CO > OH^- > F^- > SCN^-$
  - (2)  $CO > F^- > OH^- > SCN^-$
  - (3)  $SCN^- > OH^- > F^- > CO$
  - (4)  $F^- > CO > OH^- > SCN^-$
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20. Which of the following compound will not give the test of nitrogen by the help of Lassaigne's extract?

- (1) Hydrazine
  - (2) Phenyl hydrazine
  - (3) Glycine
  - (4) Urea
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21.  $\text{K}_2\text{MnO}_4$  (alkaline medium)  $\rightarrow$   $\text{KMnO}_4 + \text{MnO}_2$  Find the sum of spin-only magnetic moment of central metal ion in both the products (nearest integer).

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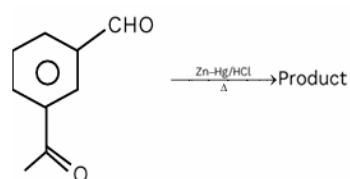
22. During the test of group IV,  $\text{NH}_4\text{Cl}$  is added with  $\text{NH}_4\text{OH}$ . Why?

- (1) To increase the concentration of  $\text{OH}^-$  ion
  - (2) To decrease the concentration of  $\text{OH}^-$  ion
  - (3) To increase the concentration of  $\text{H}^+$  ion
  - (4) To decrease the concentration of  $\text{H}^+$  ion
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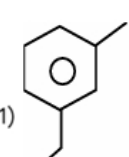
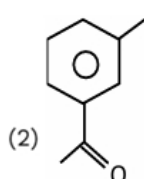
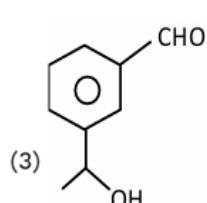
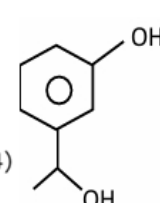
23. Statement-I:  $\alpha$ -H is responsible for carbonyls giving aldol Statement-II: Benzaldehyde ethanal show cross aldol

- (1) Both statements are correct
  - (2) Statement-I is correct and statement-II is incorrect
  - (3) Statement-II is correct and statement-I is incorrect
  - (4) Both statements are incorrect
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24. What is the correct product in the below given reaction?



The reaction shows 3-(3-formylphenyl)propan-2-one reacting with  $\text{Zn-Hg/HCl}$  and heat ( $\Delta$ ) to form a product.

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