

# JEE Main 2024 Chemistry Question Paper April 9 Shift 1

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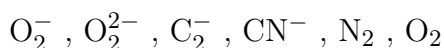
## General Instructions

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 are paramagnetic?



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2. What will be the increasing order of energy?

- (i)  $n = 4, \ell = 0$
- (ii)  $n = 4, \ell = 2$
- (iii)  $n = 4, \ell = 1$
- (iv)  $n = 3, \ell = 2$
- (v)  $n = 3, \ell = 1$

- (1) v | i | iv | iii | ii
- (2) v | ii | iv | iii | i
- (3) iv | i | v | iii | ii

(4) v ; i ; iii ; iv ; ii

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**3. Which of the following is ambident ligand?**

$\text{NO}_2^-$  ,  $\text{CN}^-$  ,  $\text{SCN}^-$  ,  $\text{H}_2\text{O}$  ,  $\text{NH}_3$  ,  $\text{C}_2\text{O}_4^{2-}$

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**4. PbS when react with dil.  $\text{HNO}_3$  then which of the following will not formed?**

- (1) S
  - (2)  $\text{N}_2\text{O}$
  - (3) NO
  - (4)  $\text{Pb}(\text{NO}_3)_2$
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**5. In the light of the given statements, choose the most appropriate answer:**

Statement-I:  $[\text{Co}(\text{en})_2\text{Cl}_2]^{+1}$  have 3 G.I.

Statement-II:  $[\text{Co}(\text{en})_2\text{Cl}_2]^{+1}$  have octahedral geometry

- (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
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**6. Which of the following are colourless?**

$\text{La}^{3+}$  ,  $\text{Eu}^{3+}$  ,  $\text{Sm}^{3+}$  ,  $\text{Nd}^{2+}$  ,  $\text{Lu}^{3+}$

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**7. Correct pair of  $\text{sp}^2$  hybridised molecule**

- (1)  $\text{BF}_3, \text{NO}_2^-$
  - (2)  $\text{BF}_3, \text{NH}_2^-$
  - (3)  $\text{BF}_3, \text{H}_2\text{O}$
  - (4)  $\text{H}_2\text{O}, \text{NO}_2^-$
- 

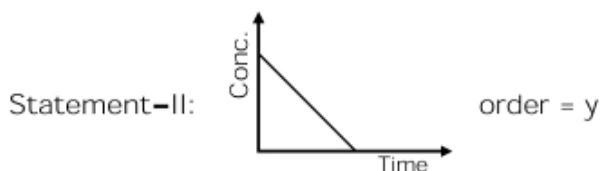
8. In the light of the given statements, choose the most appropriate answer:

Statement-I: Sulphur exists as monoclinic and rhombic form having  $\text{S}_8$  unit but  $\text{O}_2$  do not have.

Statement-II: Because  $\pi n-\pi n$  bond is present in  $\text{O}_2$  but not present in sulphur.

- (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
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9. Statement-I:  $r = k[\text{A}]^2[\text{B}]$  on doubling concentration rate becomes x times.



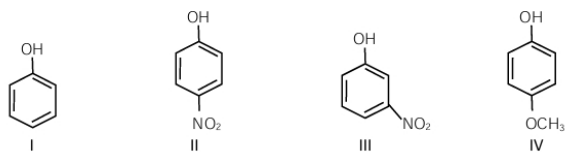
Find the value of  $x + y$ .

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10. Equal volume of 1 M HCl and 1 M  $\text{H}_2\text{SO}_4$  neutralized by dilute NaOH and heat released is x and y kcal respectively. Which is correct?

- (1)  $x = y$
  - (2)  $x = 0.5 y$
  - (3)  $x = 0.4 y$
  - (4)  $x = 2y$
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11. What is the decreasing order of pKa value for the given phenolic compounds?



- (1) I > II > III > IV
- (2) IV > III > I > II
- (3) IV > III > I > II
- (4) I > II > IV > III

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12. How many of the following are essential  $\alpha$ -amino acids?

- (1) Histidine
- (2) Arginine
- (3) Lysine
- (4) Valine
- (5) Proline
- (6) Glutamic acid
- (7) Phenyl alanine
- (8) Tryptophan
- (9) Glycine

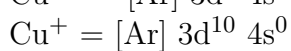
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13. Chemical formula of compound present in tooth enamel?

- (1)  $\text{Ca}_{10}(\text{PO}_4)_6\text{F}_2$
- (2)  $\text{Ca}_8(\text{PO}_4)_4\text{F}_2$
- (3)  $\text{Ca}_6(\text{PO}_4)_2\text{F}_2$
- (4)  $\text{Ca}_8(\text{PO}_4)_6\text{F}_2$

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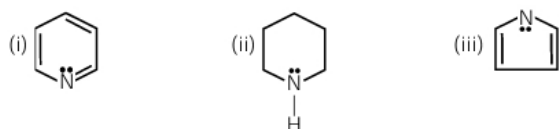
14. Consider the following electronic configurations:



Which option is correct?

- (1)  $\text{Cu}^{2+}$  is more stable in aqueous solution
  - (2)  $\text{Cu}^+$  is more stable in aqueous solution
  - (3)  $\text{Cu}^+$  and  $\text{Cu}^{2+}$  are equally stable in aqueous solution
  - (4) Depends upon copper salt
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15. Predict the basic strength order:

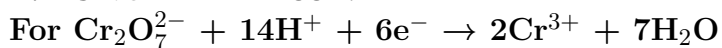


- (1) iii < i < ii
  - (2) i < iii < ii
  - (3) iii < ii < i
  - (4) ii < i < iii
- 

16. Heat of solution of  $\text{CuSO}_4(\text{s})$  and  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}(\text{s})$  is  $-72$  and  $12$  kJ/mol respectively. Molar heat of hydration of anhydrous  $\text{CuSO}_4$  is:

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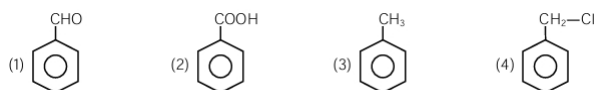
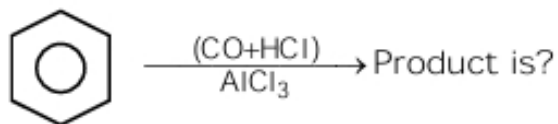
17. Given  $E^\circ = 1.33$  V.



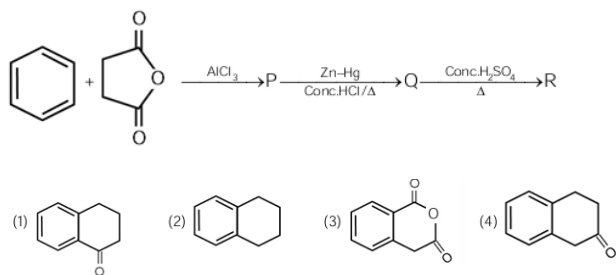
How many of the following will oxidise: Fe, Ni, Cr, Cu, Ag, Au?

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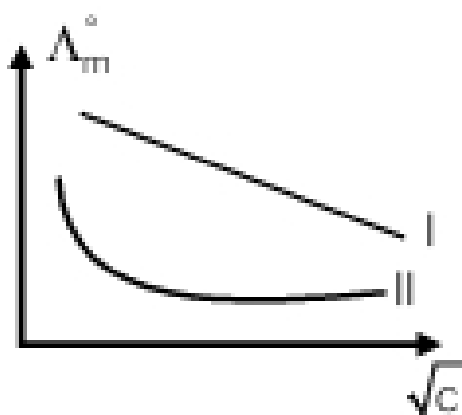
18.



19. Identify the correct product for the below given reaction:



20. Identify electrolyte type for curves I and II from the given graph.

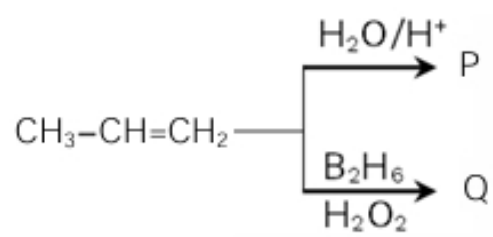


- (1) Strong electrolyte    Weak electrolyte  
 (2) Weak electrolyte    Strong electrolyte  
 (3) Strong electrolyte    Strong electrolyte  
 (4) Weak electrolyte    Weak electrolyte

21. Method of purification of compounds depends on:

- (1) Impurity  
 (2) Nature of compound and impurity  
 (3) Nature of compound  
 (4) Does not depend on impurity

22. Identify products P and Q.



- | P   | Q |
|-----|---|
| (1) |   |
| (2) |   |
| (3) |   |
| (4) |   |