

# Preparing for **JEE Exam** ?



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## SECTION – I

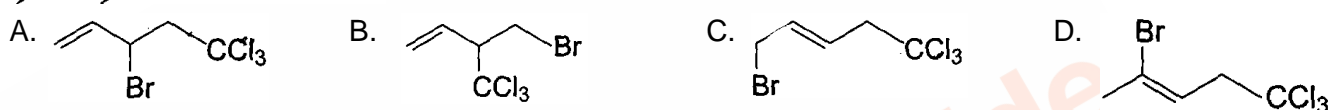
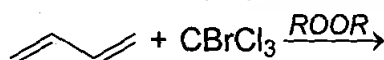
## SINGLE CORRECT CHOICE TYPE

This section contains 4 multiple choice questions. Each question has 4 choices A, B, C and D for its answer, out of which **ONLY ONE** is correct. (+3, -1) 4 x 3 = 12M

1. The increasing order of reactivity of the following compounds towards electrophilic aromatic substitution reaction is



- A. I < II < III < IV      B. IV < III < II < I      C. II < IV < I < III      D. II < IV < III < I
2. What is the major product in the reaction below



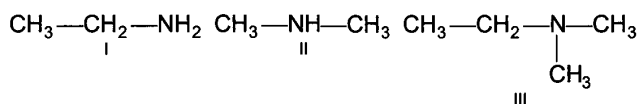
3. An organic compound contains C, H, N, S and Cl. For the detection of chlorine the sodium extract of compound is first heated with few drops of fuming  $\text{H}_2\text{SO}_4$  and then  $\text{AgNO}_3$  is added to get a white precipitate of  $\text{AgCl}$ . The digestion with  $\text{HNO}_3$  before addition of  $\text{AgNO}_3$  is
- A. To prevent the formation of  $\text{NO}_2$   
 B. To create a common ion effect  
 C. To convert  $\text{CN}^-$ ,  $\text{S}^{2-}$  to volatile  $\text{HCN}$ ,  $\text{H}_2\text{S}$ , else they will interfere with the test forming  $\text{AgCN}$  or  $\text{Ag}_2\text{S}$   
 D. To prevent the hydrolysis of  $\text{NaCN}$  and  $\text{Na}_2\text{S}$
4. In the vinyl cation, the positively charged carbon is  $\text{sp}$  hybridized. Which statement about the hybridization type of the negatively charged carbon in the vinyl carbanion is correct?
- A. The carbon is  $\text{sp}$  hybridized to help to stabilize the orbital with the lone pair  
 B. The carbon is  $\text{sp}$  hybridized to maximize s-character in the orbital with the lone pair  
 C. The carbon is  $\text{sp}$  hybridized to minimize repulsion between the bonding and non-bonding electrons  
 D. The carbon is  $\text{sp}^2$  hybridised to minimize angle strain around  $\pi$ -bond

## SECTION – II

## MULTIPLE CORRECT CHOICE TYPE

This section contains 5 multiple choice questions. Each question has 4 choices A, B, C and D for its answer, out of which **ONE OR MORE** is/are correct. (+4, -1) 5 x 4 = 20M

5. Consider the following amines



Which of the following statements is/are correct regarding their basicity?

- A. In aqueous solution, the increasing basicity is I < II < III  
 B. In gas phase, the basic strength follows the order I < II < III  
 C. The  $\text{pK}_b$  values of these amines in gas phase is in the order III < II < I  
 D. In an aqueous solution, II evolve maximum heat on the basis of per mol when neutralized by adding excess of  $\text{HCl}$
6. Which of the following sets of reagent when applied sequentially, on 2-butyne will produce a meso

product?

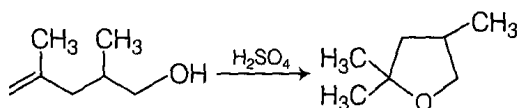
A.  $\text{CCl}_4/\text{Cl}_2$  then  $\text{Br}_2/\text{CCl}_4$

C.  $\text{Pd}/\text{BaSO}_4/\text{H}_2$  then  $\text{Br}_2\text{-CCl}_4$

B.  $\text{Na}/\text{NH}_3(\text{l})$  then  $\text{Br}_2/\text{CCl}_4$

D.  $\text{Pd}/\text{BaSO}_4/\text{H}_2$  then  $\text{OsO}_4/\text{NaHSO}_3$

7. Consider the following reaction



Which of the following is/are true statement?

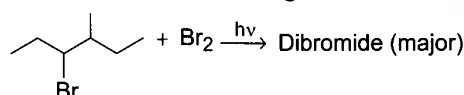
A. Reaction initiates by protonation of  $-\text{OH}$  followed by formation of carbocation

B. Reaction is initiated at  $\text{C}=\text{C}$  forming a tertiary carbocation

C. Here intramolecular reaction is favoured by entropy of reaction

D. The same reaction can also be accomplished using  $\text{NaOH}$  as catalyst

8. Consider the following bromination reaction



If a pure enantiomer of reactant is taken in the above reaction, the correct statement concerning product dibromide is/are

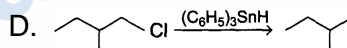
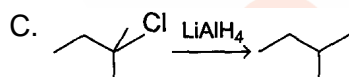
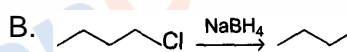
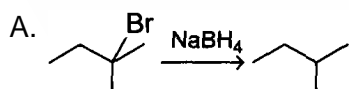
A. A racemic mixture is formed

B. Two optically active isomers are formed

C. A pair of diastereomers in equal amount is formed

D. A pair of enantiomers but in unequal amounts is formed

9. Which of the following reduction reaction and their product is/are correctly matched?



### SECTION – III

Matrix Match type.

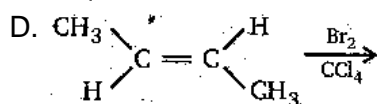
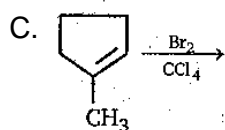
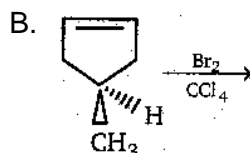
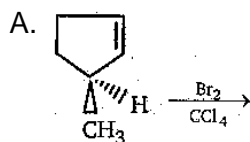
This section contains 2 questions. Each question contains statements given in two columns which have to be matched statements (A, B, C, D) in column I have to be matched with statements (P, Q, R, S) in column II.

(+8, 0)

2 x 8 = 16M

10.

#### Column – I



#### Column – II

P. Racemic mixture

Q. Meso

R. Diastereomer

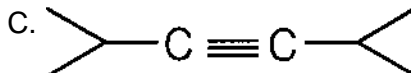
S. Vicinal dihalide

11. Column – I has some alkynes and column – II has their corresponding reaction products. Match them appropriately.

**Column – I**

A. 1-pentyne

B. 2-pentyne



D.  $\text{C}_6\text{H}_5-\text{C}\equiv\text{C}-\text{CH}_3$

**Column – II**

- P. Gives two carbonyls when treated with  $\text{H}_2\text{SO}_4/\text{HgSO}_4$  (major product)
- Q. Gives a single carbonyls when treated with  $\text{H}_2\text{SO}_4/\text{HgSO}_4$  (major products)
- R. Decolourises brown colour of  $\text{Br}_2-\text{H}_2\text{O}$  solution
- S. First on reaction with  $\text{Na}/\text{NH}_3(\text{l})$  then addition of  $\text{Br}_2$  gives racemic dibromides

**SECTION – IV**  
**COMPREHENSION TYPE**

This section contains 1 group of questions. Each group has 3 multiple choice questions based on a paragraph. Each question has 4 choices (1), (2), (3) and (4) for its answer, out of which **ONLY ONE OR MORE THAN ONE** is correct.

(+4, -1)

3 x 4 = 12M

**Paragraph for Question No.s 12 to 14**

A number of unsaturated hydrocarbons have the same molecular formula  $\text{C}_{11}\text{H}_{22}$ . All of these hydrocarbons on catalytic hydrogenation gives the same 3,4,6- trimethyloctane

12. How many structural isomers of the starting hydrocarbon, on catalytic hydrogenation can give the mentioned alkane?
1. 4                                      2. 6                                      3. 8                                      4. 10
13. How many of the above unsaturated hydrocarbons of exhibiting geometrical isomerism?
1. 3                                      2. 4                                      3. 5                                      4. 6
14. If the product alkane is 3,6-dimethyloctane, how many different isomers (structural plus geometrical only) of alkenes can give this product?
1. 6                                      2. 8                                      3. 9                                      4. 11

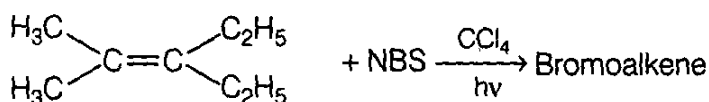
**INTEGER ANSWER TYPE**

This section contains 5 questions. The answer to each of the questions is a single-digit integer, ranging from 0 to 9. The appropriate bubbles below the respective question numbers in the ORS have to be darkened.

(+4, -1)

5 x 4 = 20M

15. How many geometrical isomers exist in 1,2,4-trichlorocyclopentane?
16. In the list below, how many of them is/are stronger acid than formic acid ( $\text{HCOOH}$ )?
- I.  $\text{CH}_3\text{COOH}$                       II.  $\text{CF}_2\text{HCOOH}$                       III.  $\text{C}_6\text{H}_5\text{COOH}$                       IV.  $(\text{COOH})_2$
- V.  $\text{Cl}_3\text{CCOOH}$                       VI.  $(\text{CH}_3)_2\text{CHOOH}$                       VII.                      VIII.  $\text{Br}-\text{COOH}$
- IX.  $\text{HO}-\text{CH}_2-\text{COOH}$                       X.  $\text{CH}_3-\text{SO}_3\text{H}$
17. Following is free radical allylic bromination reaction



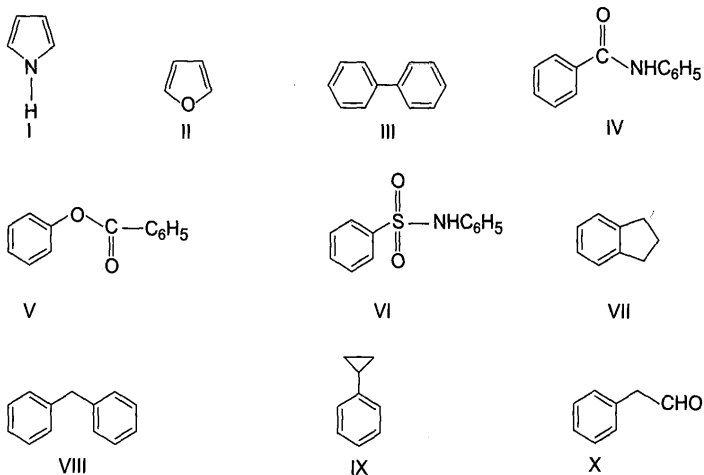
NBS : N-bromosuccinimide

How many different monobromination product(s) are expected in the above reaction?

18. How many reagents from the list below would give effervescence when reacted with 1-pentyne?

- I) NaOH      II)  $\text{CH}_3\text{CH}_2\text{ONa}$       III)  $\text{CH}_3\text{CH}_2\text{MgBr}$       IV) NaH      V)  $\text{NaNH}_2$   
VI) Na      VII)  $\text{NaHCO}_3$       VIII)  $[(\text{CH}_3)_2\text{CH}]_2\text{NLi}$       IX)  $\text{CH}_3\text{CH}_2\text{Li}$       X)  $\text{C}_6\text{H}_5\text{Li}$

19. How many of the following have an activated aromatic ring for electrophilic substitution reaction?



THE-END



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