
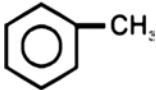



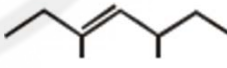
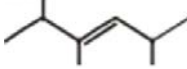
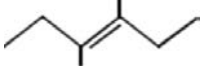
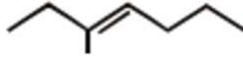


TEST - 01

Ultimate KCET Crash Course 2026

CHEMISTRY

- Q1** Choose the one out of the following having the highest mass,
 (A) 10 mL of water
 (B) 3.011×10^{22} atoms of oxygen
 (C) $\frac{1}{2}$ mole of CH_4
 (D) 1 g atom of C
- Q2** When excess of CO is used for the reaction,
 $\text{Fe}_2\text{O}_3(\text{s}) + 3\text{CO}(\text{g}) \rightarrow 2\text{Fe} + 3\text{CO}_2$ the limiting reagent is ____.
 (A) Fe (B) CO
 (C) Fe_2O_3 (D) CO_2
- Q3** What is the mass percent of carbon in carbon dioxide?
 (A) 3.4% (B) 0.034%
 (C) 28.7% (D) 27.27%
- Q4** Significant figures are:
 (A) digits after the decimal point
 (B) digits before the decimal point
 (C) meaningful digits which are known with certainty
 (D) first three digits after the decimal point
- Q5** Write the state of hybridisation of carbon in $\text{H}_2\text{C} = \text{O}$ and mention the molecular geometry also.
 (A) sp hybridised carbon, linear
 (B) sp^3 hybridised carbon, trigonal pyramidal
 (C) sp^3 hybridised carbon, tetrahedral
 (D) sp^2 hybridised carbon, trigonal planar
- Q6**  + $\text{CH}_3 - \text{Cl} \xrightarrow{\text{Anhy. AlCl}_3}$ A Product A is :
 (A) 
 (B) 
 (C) 
 (D) 
- Q7** Which is a not correct match?
 (A) Carius method - Halogens
 (B) Lassaigne's test - O_2
 (C) Leibig's method - C and hydrogen
 (D) Kjeldahl's method - N_2
- Q8** Which of the following alkenes is most suitable for the preparation butanone by ozonolysis:
 (A) 
 (B) 
 (C) 
 (D) 
- Q9** Which product is obtained by passing ethanol vapours over heated alumina ?
 (A) C_2H_4 (B) CH_4
 (C) C_2H_6 (D) C_2H_2



Q10 An optically active alkene (X) has the molecular formula C_6H_{12} . The catalytic hydrogenation of (X) gives an achiral product. The structure of (X) would be:

- (A)
$$\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH} = \text{CH} - \text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$$
- (B)
$$\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH}_2 - \text{CH} = \text{CH}_2 \\ | \\ \text{CH}_3 \end{array}$$
- (C)
$$\begin{array}{c} \text{CH}_3 - \text{CH} - \text{C} \equiv \text{CH} \\ | \\ \text{C}_2\text{H}_5 \end{array}$$
- (D)
$$\begin{array}{c} \text{CH}_3 - \text{CH} - \text{CH} = \text{CH}_2 \\ | \\ \text{C}_2\text{H}_5 \end{array}$$

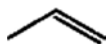
Q11 An aqueous solution of compound A gives ethane on electrolysis. The compound A is

- (A) Sodium ethoxide
(B) Ethyl acetate
(C) Sodium acetate
(D) Sodium propionate

Q12 What product is obtained by heating ethylidene chloride with alcoholic KOH ?

- (A) Ethyne (B) Ethane
(C) Methane (D) Ethene

Q13 Assertion (A): Addition of HBr on



in presence of peroxide give

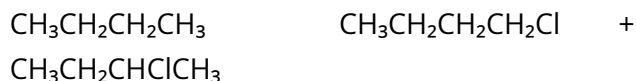


as major product.

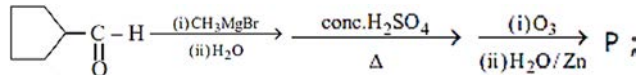
Reason (R): Addition of HBr on alkene proceed by carbocation intermediate.

- (A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true but R is not the correct explanation of A.
(C) A is true but R is false.
(D) A is false but R is true.

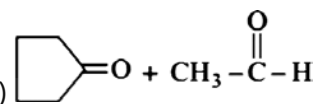
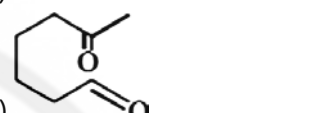
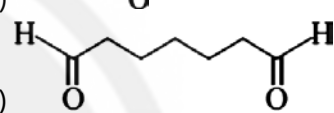

Q14 Which reagent will you use for the following reaction ?



- (A) Cl_2 gas in dark
(B) Cl_2 / UV light
(C) $\text{NaCl} + \text{H}_2\text{SO}_4$
(D) Cl_2 gas in the presence of iron in dark

Q15 

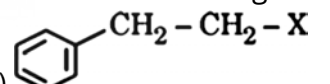
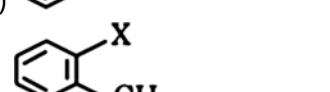
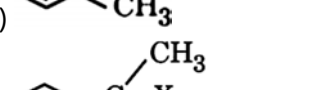
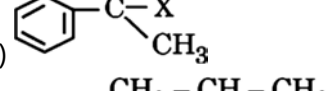
P is / are :

- (A) 
- (B) 
- (C) 
- (D) 

Q16 Which one of the following halides contains $\text{Csp}^2 - \text{X}$ bond ?

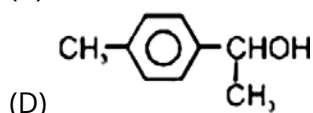
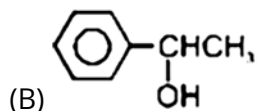
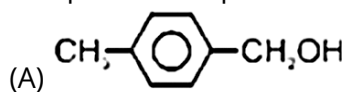
- (A) Vinyl halide (B) Alkyl halide
(C) Allyl halide (D) enyl halide

Q17 Which of the following is a benzylic halide?

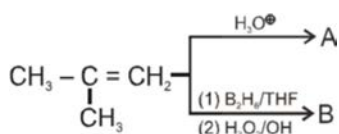
- (A) 
- (B) 
- (C) 
- (D) 



Q18 An organic compound having the molecular formula $C_8H_{10}O$ on being heated with I_2 and dilute $NaOH$ gives a yellow precipitate. The compound is expected to be :



Q19



Product (A) and (B) can be distinguished by

- (A) Esterification reaction
 (B) Neutral $FeCl_3$
 (C) Lucas reagent
 (D) Sodium metal

Q20 Which of the following reagents can be used to oxidise primary alcohols to aldehydes?

- (A) CrO_3 in an anhydrous medium.
 (B) Pyridinium chlorochromate.
 (C) All of these
 (D) Heat in the presence of Cu at $573K$.

Q21 Assertion (A): With $Br_2 - H_2O$, phenol gives 2,4,6-tribromophenol but with $Br_2 - CS_2$ it gives 4 bromophenol as the major product.

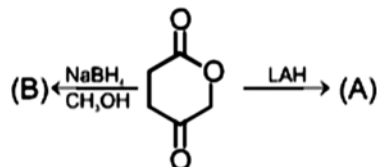
Reason (A): In water ionization of phenol is enhanced but in CS_2 , it is greatly suppressed.

- (A) Both A and R are true and R is the correct explanation of A.
 (B) Both A and R are true but R is not the correct explanation of A.
 (C) A is true but R is false.
 (D) A is false but R is true.

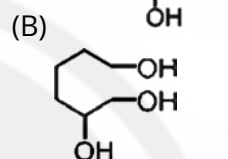
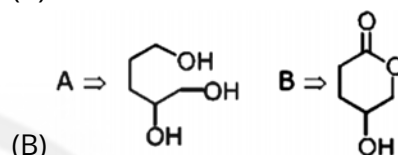
Q22 Which of the following compounds will undergo self-condensation in the presence of dilute $NaOH$ solution ?

- (A) C_6H_5CHO (B) CH_3CH_2CHO
 (C) $H-CHO$ (D) $(CH_3)_3C-CHO$

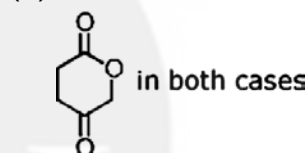
Q23 The products (A) and (B) are :



(A) No reaction in both cases



(C) in both cases



(D) in both cases

Q24 Which of the following is most reactive in nucleophilic addition reactions ?

- (A) CH_3COCH_3 (B) $CH_3COC_2H_5$
 (C) $HCHO$ (D) CH_3CHO

Q25 Assertion (A): Benzaldehyde gives a positive test with Benedict's and Fehling solution.

Reason (R): Benzaldehyde forms black precipitate or silver mirror with Tollen's reagent.

- (A) Both A and R are true and R is the correct explanation of A.
 (B) Both A and R are true but R is not the correct explanation of A.
 (C) A is true but R is false.
 (D) A is false but R is true.



Q26 Assertion (A): Halogen acids do not add on to carbonyl bond.

Reason (R): Addition depends upon the polarisation of HX and carbonyl bond.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Q27 Benzylamine may be alkylated as shown in the following equation: $C_6H_5CH_2NH_2 + R-X \rightarrow C_6H_5CH_2NHR$

Which of the following alkyl halides is best suited for this reaction through S_N1 mechanism?

(A) C_2H_5Br

(B) CH_3Br

(C) C_6H_5Br

(D) $C_6H_5CH_2Br$

Q28 The strongest base in aqueous solution among the following amines is:

(A) $(C_2H_5)_3N$

(B) $(C_2H_5)_2NH$

(C) $C_6H_5NH_2$

(D) $C_2H_5NH_2$

Q29 The end-product in the reaction sequence would be: Ethyl amine $\xrightarrow{HNO_2} A \xrightarrow{PCl_5} B \xrightarrow{NH_3} C$

(A) Ethyl amine

(B) Methyl amine

(C) Ethyl cyanide

(D) Acetamide

Q30 Aniline does not undergo Friedel - Crafts reaction because:

(A) All of these

(B) $AlCl_3$ act as a catalyst

(C) Aluminium chloride reacts with Aniline

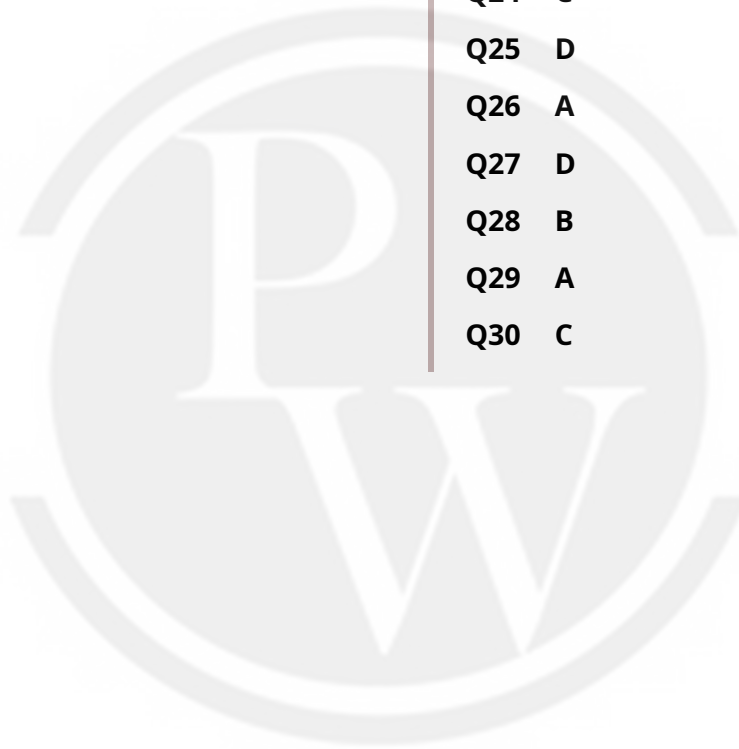
(D) Anilium ion deactivates any further reaction



Answer Key

Q1 D
Q2 C
Q3 D
Q4 C
Q5 D
Q6 A
Q7 B
Q8 C
Q9 A
Q10 D
Q11 C
Q12 A
Q13 B
Q14 B
Q15 B

Q16 A
Q17 C
Q18 B
Q19 C
Q20 C
Q21 A
Q22 B
Q23 B
Q24 C
Q25 D
Q26 A
Q27 D
Q28 B
Q29 A
Q30 C



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Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

Calculations & inference :

1 g atom of C

1 gm atomic mass of C

= 12.00 g

One mole of CH₄

= gram molar mass of CH₄

= 16 g

mass of $\frac{1}{2}$ mole of CH₄ = 8.0 g

Mass of 10 ml of water

= 10 gms

(since, density of water = 1 gm/ml)

Mass of 6.022×10^{22} atoms of Oxygen

Since, 6.022×10^{23} atoms of Oxygen weighs

= its gm atomic mass (i.e. 16 g)

mass of 3.011×10^{23} atoms of O

= 8.0 g

mass of 3.011×10^{22} atoms of O

= 0.80 g

Thus, the mass of 1 g atom of Carbon is highest out of the above.

Video Solution:



Q2 Text Solution:

As per stoichiometry of the reaction, $\text{Fe}_2\text{O}_3(\text{s}) + 3\text{CO}(\text{g}) \rightarrow 2\text{Fe} + 3\text{CO}_2$

Fe_2O_3 is the limiting reagent for the given reaction as it would be consumed first, because the other reagent i.e. $\text{CO}(\text{g})$ is used in excess.

Video Solution:



Q3 Text Solution:

Mass percent of C in CO_2

$$= \frac{\text{Molar mass of carbon} \times 100}{\text{Molar mass of } \text{CO}_2}$$

Mass of C = 12 g

$$\text{Molar Mass of } \text{CO}_2 = 12 \times 1 + 16 \times 2 = 44 \text{ g}$$

$$\text{Therefore, \% of C in } \text{CO}_2 = \frac{12}{44} \times 100 = 27.27\%$$

Video Solution:



Q4 Text Solution:

Significant digits are certain digits that have significance or meaning to certain digits in a number.

Such digits help scientists to use them with more precise information about measurement and other numeric data. These digits also help them in rounding off a very large or very small number

Video Solution:**Q5 Text Solution:**

Due to the presence of a double bond in the carbonyl carbon ($>C=O$), carbon is sp^2 hybridised.

This hybridization leads to a trigonal planar geometry which means a bond angle of 120° around the C.

Video Solution:**Q6 Text Solution:**

Given example is of Friedel crafts alkylation of benzene. Reaction of benzene with alkyl halide in presence of Anhyd $AlCl_3$ lead to formation of alkyl benene. In this case, it is Toluene.

Video Solution:**Q7 Text Solution:**

Lassaigne's test is used to detect the presence of nitrogen and halogens in organic compounds, not oxygen.

The other methods listed correctly correspond to their respective elements or compounds: Carius method for halogens, Liebig's method for carbon and hydrogen, and Kjeldahl's method for nitrogen.

Video Solution:

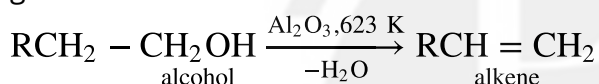
Q8 Text Solution:

Ozonolysis of alkenes breaks the double bond and forms carbonyl compounds.

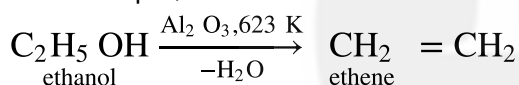
To prepare butanone, the starting alkene must have the right structure to yield a four carbon ketone after ozonolysis. Option C likely has the appropriate carbon skeleton that, when cleaved, results in 2 moles butanone.

Video Solution:**Q9 Text Solution:**

It is an example of dehydration of alcohols to give alkenes.



For example,



Thus, when ethanol vapours are passed over heated alumina, the alcohol gets dehydrated to form ethene, as given above.

Video Solution:**Q10 Text Solution:**

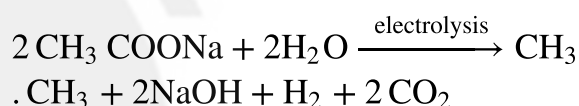
1. The alkene is optically active, meaning it has chirality and can exist in two enantiomeric forms.

2. Upon catalytic hydrogenation, it yields an achiral product, indicating that the addition of hydrogen removes the chirality.

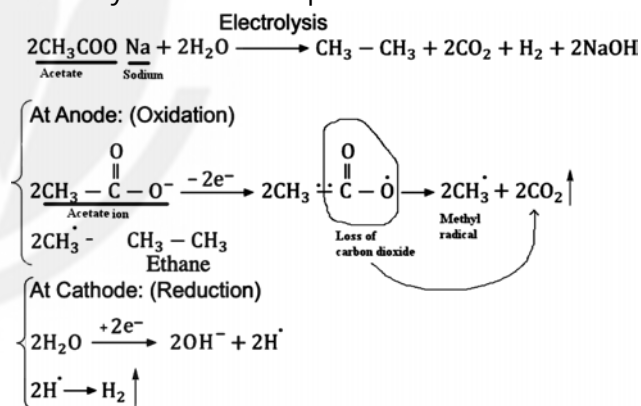
Option D fulfills these 2 criteria.

Video Solution:**Q11 Text Solution:**

This is an example of Kolbe's electrolysis method. The reaction is:

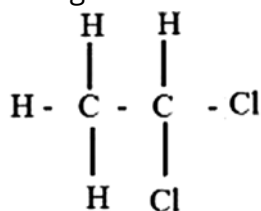


The step-wise redox reactions occurring in the electrolytic cell are depicted as under

**Video Solution:**

Q12 Text Solution:

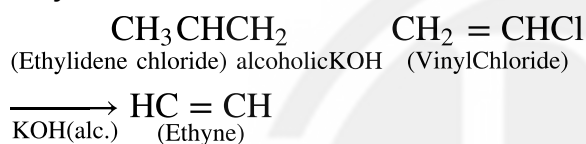
Ethylidene chloride is 1,1 - dichloroethane having the structural formula,



Structural formula of Ethylidene di chloride or 1,1-dichloro ethane

Ethylidene chloride, when treated with alcoholic KOH forms ethyne.

The reaction takes place in two steps giving vinyl chloride in the first step, which further undergoes an elimination reaction to form ethyne. as shown below,



Video Solution:

**Q13 Text Solution:**

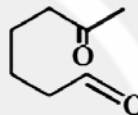
Both A and R are true but R is not the correct explanation of A.

Video Solution:

**Q14 Text Solution:**

Production of alkyl chlorides from alkanes can be carried out by chlorination under the presence of UV light. Chlorine molecule (Cl_2) under the influence of UV light forms free radicals, which react with alkanes to form a mixture of isomeric monohaloalkane and polyhaloalkanes.

Video Solution:

**Q15 Text Solution:**

Video Solution:

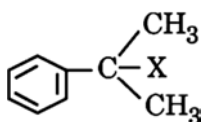
**Q16 Text Solution:**

Vinyl halide

Video Solution:



Q17 Text Solution:

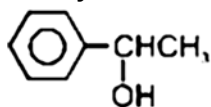


Video Solution:



Q18 Text Solution:

Iodine and NaOH form yellow ppt with either methylcarbinols or methyl ketones.



is a methyl carbinol with the suggested molecular formula

Video Solution:



Q19 Text Solution:

A is tertiary alcohol and B is primary alcohol and these can be distinguished by Lucas reagent

Video Solution:



Q20 Text Solution:

Oxidation of alcohols to aldehydes is partial oxidation; aldehydes are further oxidized to carboxylic acids. Conditions required for making aldehydes are heat and distillation.

In aldehyde formation, the temperature of the reaction should be kept above the boiling point of the aldehyde and below the boiling point of the alcohol.

These include:

- Chromium-based reagents, such as Collins reagent ($\text{CrO}_3 \cdot \text{Py}_2$)
- PDC or PCC.
- Heat in the presence of Cu at 573K.

Video Solution:



Q21 Text Solution:

Both assertion and reason are true and reason is the correct explanation of assertion.

Video Solution:



Q22 Text Solution:

$\text{CH}_3\text{CH}_2\text{CHO}$ undergoes self condensation as it has α – carbon

Video Solution:



Q23 Text Solution:

NaBH_4 does not reduce esters. It only reduces Ketones $\text{C}=\text{O}$ to $\text{CH}-\text{OH}$

LiAlH_4 reduces ester to alcohol and ketone to alcohol

Video Solution:**Q24 Text Solution:**

HCHO is most reactive towards nucleophilic addition reaction.

Video Solution:**Q25 Text Solution:**

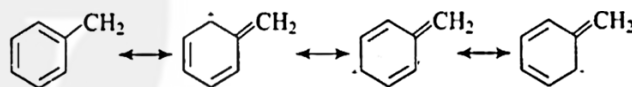
Benedict's solution (Cu^{2+} + citric acid + base) and Fehling solution (Cu^{2+} + tartaric acid + base) are weaker oxidising agents than Tollen's reagent $[\text{Ag}(\text{NH}_3)_2]^+$; they oxidise aliphatic aldehydes but are not capable of oxidising aromatic aldehydes.

Video Solution:**Q26 Text Solution:**

The high degree of polarity in HX as well as in carbonyl bond shows the easy addition of HX on carbonyl bond but as soon as the addition products are formed, the products loses HX to show the backward reaction.

Video Solution:**Q27 Text Solution:**

$\text{S}_{\text{N}}1$ substitution reaction occurs in two steps. In the first step, $\text{R}-\text{X}$ bond is broken to produce a carbocation that is attacked by the nucleophile. The greater the stability of carbocation, the greater will be the rate of reaction. Benzylic halides show high reactivity towards $\text{S}_{\text{N}}1$ reaction.

**Video Solution:****Q28 Text Solution:**

$(\text{C}_2\text{H}_5)_2\text{NH}$

In aq. solutions the basic nature follows the order $2^\circ > 1^\circ > 3^\circ$

Video Solution:

Q29 Text Solution:

Ethyl amine $\xrightarrow{\text{HNO}_2}$ ethyl alcohol

$\xrightarrow{\text{PCl}_5}$ ethyl chloride $\xrightarrow{\text{NH}_3}$ Ethyl amine

Video Solution:**Q30 Text Solution:**

AlCl_3 being a lewis acid reacts with the lone pair of $-\text{NH}_2$ group of aniline forming an adduct ($\text{C}_6\text{H}_4\text{NH}_2^+\text{AlCl}_3$) which deactivates the benzene system hence no friedal craft reaction occurs.

Video Solution:[Android App](#)[iOS App](#)[PW Website](#)

PW