



CET OBJECTIVE QUESTION ON

- 1. CONCEPTS IN ORGANIC CHEMISTRY**
- 2. SYNTHETIC ORGANIC CHEMISTRY**
- 3. ISOMERISM – II**
- 4. HYDROCARBONS – II**
- 5. HALOALKANES**

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1. The inductive effect

- a. Implies the atoms ability to cause bond polarization
- b. Increases with increase in distance
- c. Implies the transfer of lone pair of electrons from more electronegative atom to the lesser electronegative atom in a molecule
- d. Implies the transfer of lone pair of electrons from lesser electronegative atom to more electronegative atom in a molecule

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2. The oxygen atom in phenol

- a. Exhibits only inductive effect
- b. Exhibits only resonance effect
- c. **Has more dominating resonance effect than inductive effect**
- d. Has more dominating inductive effect than resonance effect

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3. The activating effect of $-\text{OCH}_3$ group attached to the benzene ring can be explained in terms of

a. +R effect

b. $-R$ effect

c. + E effect

d. $-I$ effect



4. Orbital interaction between sigma bonds of a substituent group and a neighboring π - orbital is known as

a. Sterric effect

b. Inductive effect

c. Electromeric effect

d. Hyperconjugation effect



5. Amongst the following the most basic compound is

- a. Aniline
- b. **Benzyl amine**
- c. p – nitroaniline
- d. Acetanilide

In Benzylamine, the lone pair of Electrons on N atom of amino group are readily available for Donation



6. The group which exerts both +R and -R effect is

a. $-\text{NO}_2$

b. $-\text{NHR}$

c. $-\text{NO}$

d. $-\text{OCH}_3$

In $-\text{NO}$ (Nitroso group) , release of lone pair of electrons of nitrogen away from substituent, is +R effect, While shift of π (pi) electron pair of $\text{N}=\text{O}$ bond is due to -R effect.

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7. For an optically active compound, which of the following requirement is necessary?

a. A double bond

b. **Presence of one chiral carbon**

c. Presence of plane of symmetry

d. none of these



8 A compound with molecular formula C_7H_{16} shows optical isomerism, the compound will be

- a. 2, 3-dimethylpentane**
- b. 2, 2-dimethylpentane**
- c. 2-methylhexane**
- d. None of these**

The molecule has a asymmetric carbon at C_3 . So it show optical activity



9. In the reaction



a chiral centre is produced. Thus product would be

- a. Meso compound
- b. **Racemic mixture**
- c. Laevorotatory
- d. Dextrorotatory

The products containing one chiral carbon are always Racemic.



10. Meso-Tartaric acid is optically inactive due to the presence of

- a. Molecular asymmetry
- b. Presence of chirality
- c. **Internal compensation**
- d. External compensation

Cancellation of optical activity due to presence of plane of symmetry



11. When Cyclohexane is poured in water, it floats because

- a. Cyclohexane is in boat form
- b. Cyclohexane is in chair form
- c. Cyclohexane is in crown form
- d. **Cyclohexane is less dense than water**



12. Alcoholic potash is used in organic chemistry to bring about

- a. Dehydrogenation
- b. Hydration
- c. **Dehydrohalogenation**
- d. Hydrohalogenation

In Alcoholic KOH, OH^- acts as a base and abstracts a proton and results in dehydrohalogenation



13. Isopropyl chloride is prepared in the laboratory by the action of dry hydrogen chloride on isopropyl alcohol in the presence of anhydrous zinc chloride. This reaction is known as

- a. Dehydration**
- b. Dehydrohalogenation**
- c. Hydrolysis**
- d. oxidation**



14. Alkyl halides on treatment with aqueous KOH give

- a. Alkanes
- b. Acids
- c. Alkenes
- d. **Alcohols**

In aqueous KOH, OH^- acts as a nucleophile which attacks the positive center giving substitution product



15. The reactivity of alkyl halides follows the following order



The alkylhalide having weaker C-X bond has greater reactivity



16. Which one of the following is an Aralkyl halide

- a. Chlorobenzene
- b. Bromobenzene
- c. **Benzyl chloride**
- d. Ethyl bromide



17. A gas formed by the action of alc. KOH on ethyl iodide, decolourises alkaline KMnO_4 , the gas is

- a. CH_4
- b. C_2H_6
- c. C_2H_4
- d. C_2H_2



18. S_N1 reaction is favored by

- a. Polar solvents
- b. Nucleophile can be mild in nature
- c. Low concentration for nucleophile
- d. **All the three**



19. Complete inversion of configuration takes place in

- a. S_N2
- b. S_N1
- c. Both
- d. None

Walden Inversion takes place

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20. The order of reactivity of alkylhalide through S_N2 mechanism is

a. $1^\circ > 2^\circ > 3^\circ$

b. $1^\circ > 2^\circ < 3^\circ$

c. $1^\circ < 2^\circ > 3^\circ$

d. $1^\circ < 2^\circ < 3^\circ$



21. Benzene reacts with acetyl chloride in presence of AlCl_3 to give

- a. Toluene
- b. Xylene
- c. **Acetophenone**
- d. Benzophenone

This is Friedel- crafts acylation

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22. In S_N2 reaction at chiral carbon of a compound always gives

- a. An Enantiomer of the substrate
- b. A product with opposite optical rotation
- c. A mixture of Diastereomers
- d. **A single stereoisomer**

Inversion of configuration takes place. Single stereoisomer is produced which need not be optically active



23. S_N1 reaction of alkyl halides leads to

- a. Retention of configuration
- b. **Racemisation**
- c. Inversion of configuration
- d. None

Because both the isomers are formed. This leads to cancellation in optical rotation

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24. The process of separation of Racemic modification into d and l isomers is called

- a. Resolution**
- b. Dehydration**
- c. Revolution**
- d. Hydration**



25. Propene is reacted with HBr in the presence of peroxide, the product is

- a. 2-Bromopropane
- b. **1-Bromopropane**
- c. 3- Bromopropane
- d. None of these

The reaction is governed by Anti-Markwonikoff's rule

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26. Which of the following alkylhalides is used as methylating agent?

- a. C_2H_5Cl
- b. C_2H_5Br
- c. C_2H_5I
- d. **CH_3I**



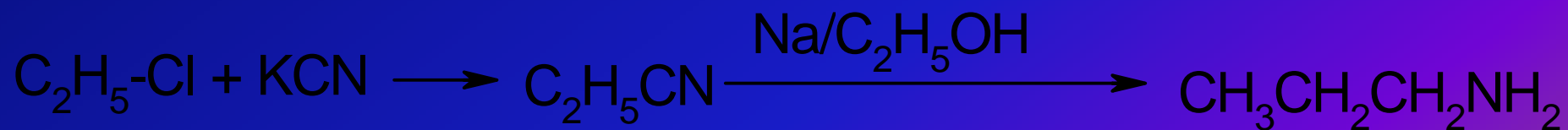
27. 1-Chlorobutane when treated with alcoholic potash gives

- a. **1-Butene**
- b. **2-Butanol**
- c. **2-Butene**
- d. **2-Butanol**



28. The product obtained on treatment of ethyl chloride with potassium cyanide was reduced by sodium and alcohol to give

- a. Propyl amine
- b. ethyl amine
- c. acetic acid
- d. butyl amine



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29. Butanenitrile may be prepared by heating

a. Propyl alcohol with KCN

b. Butyl chloride with KCN

c. **Propyl chloride with KCN**

d. Butyl alcohol with KCN



30. Most reactive halide towards S_N1 reaction is

- a. n-Butyl chloride
- b. sec-Butyl chloride
- c. **tert-Butyl chloride**
- d. Ethyl chloride

More stable carbocation



31. If methyl bromide and ethyl bromide are mixed in equal proportions and the mixture is treated with sodium, the number of possible alkanes formed is

- a. 1
- b. 2
- c. 3
- d. 4



32. Carbon—Carbon bond length in benzene is

- a. 134 pm
- b. 154 pm
- c. **139 pm**
- d. 143 pm



33. Heating a mixture of sodium benzoate or benzoic acid and soda lime gives

- a. Toluene
- b. Phenol
- c. **Benzene**
- d. Sodium chloride

Soda lime is a decarboxylating agent.



34. Catalytic hydrogenation of benzene gives

- a. Benzoic acid
- b. Toluene
- c. **Cyclohexane**
- d. Xylene



35. Benzene is converted into toluene by

- a. Friedel – crafts reaction**
- b. Grignard reaction**
- c. Wurtz reaction**
- d. Perkin reaction**



36. Nitration of toluene using fuming sulphuric acid and nitric acids give

- a. Trinitro toluene**
- b. o – nitro toluene**
- c. m – nitrobenzene**
- d. p- nitro phenol**



37. Which of the following theories can explain the stability of Cyclohexane and its higher members?

- a.. Bayer strain theory
- b. **Sachse-Mohr's theory**
- c. Arrhenius theory
- d. None of the above



38. Which of the following deactivates benzene substitution?

- a. $-\text{NHR}$
- b. $-\text{OH}$
- c. $-\text{OR}$
- d. $-\text{COOR}$

$-\text{COOR}$ is an electron withdrawing group



39. In nitration Conc. H_2SO_4 acts as

- a. Sulphonating agent
- b. Helps in producing NO_2^+**
- c. Produces SO_3
- d. Dehydrating agent



40. -COOH group present on the benzene ring directs the incoming group to

- a. o-position
- b. p-position
- c. **m-position**
- d. o and p



41. Isopropyl chloride undergoes hydrolysis by

- a. S_N1 mechanism
- b. S_N2 mechanism
- c. **S_N1 mechanism and S_N2 mechanism**
- d. None

2° halides may undergo S_N1 as well S_N2



42. The ratio of π to σ bonds in benzene is

a. 1:2

b. 1:3

c. 1:4

d. 4:1

There are 3 π and 12 σ bonds in benzene

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43. Which of the following is the most reactive Cycloalkane?

- a. **Cyclopropane**
- b. Cyclobutane
- c. Cyclopentane
- d. Cyclohexane

Because it is most strained Cycloalkane



44. Select the true statement from the following

a. Because of unsaturation benzene undergoes addition reaction.

b. There are two types of C–C bonds in benzene molecule.

c. There is a cyclic delocalization of π electrons in benzene.

d. Monosubstitution of benzene molecule gives 3 isomeric substances.

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45. Which of the following can be used as a catalyst in Friedel- Crafts reaction?

- a. AlCl_3
- b. BF_3
- c. **Both**
- d. None

Any Lewis acid can be used as a catalyst in Friedel –Crafts reaction



46. An enantiometrically pure acid is treated with a Racemic mixture of an alcohol having one chiral carbon. The ester formed is

- a. Optically active mixture**
- b. Pure enantiomer**
- c. Racemic mixture**
- d. Meso compound**

Optically active compound when treated with Racemic mixture give optically active isomers

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47. Cis-2-butene and trans-2-butene can be distinguished by

- a. Their Physical properties
- b. Their reduction properties
- c. Products on Ozonolysis
- d. **Their addition product with Br_2**

Addition of Br_2 to alkene is a trans addition . Hence products of two isomers are different

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48. The bond angle in Chair and boat form of Cyclohexane is

- a. 120°
- b. $109^{\circ} 28'$
- c. 60°
- d. 180°



49. A compound that undergoes bromination more easily is

a. Benzoic acid

b. Toluene

c. Benzene

d. Phenol

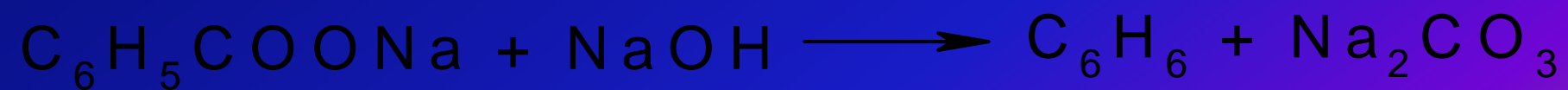
+R effect is predominant in Phenol

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50. Benzene can be obtained by heating either benzoic acid with 'X' or phenol with 'Y'. X and Y are respectively

- a. Zinc dust and NaOH
- b. Soda lime and copper
- c. Zinc dust and soda lime
- d. **Soda lime and Zinc dust**





**THANK
YOU**

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