



# 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.  $-\text{R}$  effect**
- c. + E effect**
- d.  $-\text{I}$  effect**



**4. Orbital interaction between sigma bonds of a substituent group and a neighboring  $\pi$ -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**



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

a.  $-\text{NO}_2$

b.  $-\text{NHR}$

c.  $-\text{NO}$

d.  $-\text{OCH}_3$



**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



9. In the reaction



a chiral centre is produced. Thus product would be

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



**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**



**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**



**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**



**15. The reactivity of alkyl halides follows the following order**

- a)  $\text{C}_2\text{H}_5\text{Cl} > \text{C}_2\text{H}_5\text{Br} > \text{C}_2\text{H}_5\text{I}$
- b)  $\text{C}_2\text{H}_5\text{I} > \text{C}_2\text{H}_5\text{Br} > \text{C}_2\text{H}_5\text{Cl}$
- c)  $\text{C}_2\text{H}_5\text{Br} > \text{C}_2\text{H}_5\text{I} > \text{C}_2\text{H}_5\text{Cl}$
- d)  $\text{C}_2\text{H}_5\text{Cl} > \text{C}_2\text{H}_5\text{I} > \text{C}_2\text{H}_5\text{Br}$





**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  $\text{KMnO}_4$ , the gas is**

- a.  $\text{CH}_4$
- b.  $\text{C}_2\text{H}_6$
- c.  $\text{C}_2\text{H}_4$
- d.  $\text{C}_2\text{H}_2$



## 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



**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**



**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**



**23.  $S_N1$  reaction of alkyl halides leads to**

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





**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**



**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**



**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



**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**



## 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.  $-\text{COOR}$



**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



**42. The ratio of  $\pi$  to  $\sigma$  bonds in benzene is**

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



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

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



**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  $\pi$  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.  $\text{AlCl}_3$
- b.  $\text{BF}_3$
- c. Both
- d. None



**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**



**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  $\text{Br}_2$**





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

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



**49. A compound that undergoes bromination more easily is**

**a. Benzoic acid**

**b. Toluene**

**c. Benzene**

**d. Phenol**





**THANK  
YOU**

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