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| **PT1/CHAK/1223/A 10-APR-2023** | | | |
| **PERIODIC TEST - I (2023-24)** | | | |
| **Subject: Chemistry (Answer Key)**  **Grade: XII** | | Max. Marks: 35Time: 1 Hr 15 Mins | |
| 1. | 1. They have the same specific rotation | | 1 |
| 2 | 1. p- Dichlorobenzene | | 1 |
| 3 | 1. CH2=CH-CH(Cl) -CH3 | | 1 |
| 4 | 1. 1-bromoethane < 1-bromopropane < 1-bromobutane < Bromobenzene | | 1 |
| 5 | c) C6H5C(CH3)(C6H5)Br | | 1 |
| 6 | KCN is predominantly ionic and provides cyanide ions in solution. Although both carbon and nitrogen atoms are in a position to donate electron pairs, the attack takes place mainly through carbon atom and not through nitrogen atom since C—C bond is more stable than C—N bond. However, AgCN is mainly covalent in nature and nitrogen is free to donate electron pair forming isocyanide as the main product | | 2 |
| 7 | 1. Resonance effect : C—Cl bond acquires a partial double bond character due to resonance. 2. Difference in hybridisation of carbon atom in C—X bond: The sp2 hybridised carbon with a greater s-character is more electronegative and can hold the electron pair of C—X bond more tightly than sp3-hybridised carbon in haloalkane with less s-chararcter. 3. Instability of phenyl cation: In case of haloarenes, the phenyl cation formed as a result of self-ionisation will not be stabilised by resonance 4. Because of the possible repulsion, it is less likely for the electron rich nucleophile to approach electron rich arenes. | | 2 |
| 8 | Aq KOH is ionized and produces OH- ions, a strong nucleophile and brings about substitution. Alc KOH contains alkoxide ions RO- which is a stronger base than OH-, eliminates HCl from alkyl chloride to form alkene | | 2 |
| 9 | 1. Due to resonance, partial double bond character in chlorobenzene 2. A planar carbocation is produced which can be attacked from any side by the nucleophile giving 50:50 chances of dextro and laevo products | | 2 |
| 10 | a) B  b) carbontetrachloride < chloroform< Dichloromethane | | 2 |
| 11 | 1. Resonance stabilised carboation in allyl chloride 2. Chloroform is slowly oxidised by air in the presence of light to an extremely poisonous gas, carbonyl chloride, also known as phosgene. It is therefore stored in closed dark coloured bottles completely filled so that air is kept out.      1. The byproducts SO2 and HCl are gaseous and the pure haloalkane is obtained. | | 3 |
| 12 | 1. 2-Bromobutane (structure showing chiral carbon) 2. 1-Bromobutane (structure showing 10 carbocation) 3. 1-Bromo-2-methylpropane and 2-Bromo-2-methylpropane (equation) | | 3 |
| 13 |  | | 3 |
| 14 | 1. 2-Bromo-4-chloropentane 2. Grignard reagents are highly reactive and react with any source of proton to give hydrocarbons.      1. In order for a haloalkane to dissolve in water, energy is required to overcome the attractions between the haloalkane molecules and break the hydrogen bonds between water molecules. Less energy is released when new attractions are set up between the haloalkane and the water molecules as these are not as strong as the original hydrogen bonds in water. | | 3 |
| 15 |  | | 3 |
| 16 | 1. 1) CH3Cl + C6H5Cl + 2Na----------🡪 C6H5CH3 + 2NaCl   2) CH3Cl + NaI----dry acetone-----🡪 CH3I + NaCl  b)  c) 1) CH3CH2CH=CH2 + HBr---------🡪 CH3CH2CH(Br)-CH3  2) CH3CH2Br + KCN-----------🡪 CH3CH2CN +KBr | | 5 |

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