ACADEMIC WORLD SCHOOL™
BEMETARA

SUMMER VACATION ASSIGNMENT
SESSION 2020-21
CLASS: XII

SUBJECT- CHEMISTRY

General Instructions

(i) Give chemical equation wherever required.

(ii) Q1 to Q3 are objective type question and should answer in one word or one sentence.

Q1. Read the passage carefully and answer the following questions.

Since halogen atoms are more electronegative than carbon, the carbon halogen bond of alkyl halide is polarized; the carbon atom bears a partial positive charge whereas the halogen atom bears a partial negative charge Since the size of halogen atom increases as we go down the group in the periodic table,fluorine atom is the smallest and iodine atom, the largest. Consequently the carbon-halogen bond length also increases from C—F to C—I.

(i) Why the polarity of C-I bond is less than C-F bond.

(ii) although R-X is polar in nature it is less soluble in water.

(iii) out of haloalkanes and haloarenes which one is more polar and why?

(iv) Write the structure of the following 1-Chloro-2-phenylethane.

(v) How vinylic group is different from allylic group?

Q2. Choose the correct option

(i) In unimolecular substitution reaction alkyl halide react with carbocation intermediate the order of reactivity of the carbocations is;

(a) $3^0 > 2^0 > 1^0$ (b) $1^0 > 2^0 > 3^0$

(c) $2^0 > 1^0 > 3^0$ (d) $3^0 = 2^0 > 1^0$

(ii) Rubber is a

(a) Conducting polymer (b) Oriented polymer

(c) elastomers (d) commercial febric

(iii) Nylon 6,6 is so named because it is a polyamide formed from a

(a) 6 carbon of dibase and diamine. (b) 6 carbon of diacid and diamine

(c) 6 carbon of diacid and diamide (d) 6 carbon of caprolactum and diamine.

(iv) Which of the following has the highest dipole moment

(a) o-dichlorobenzene (b) m-dichlorobenzene

(c) p-dichlorobenzene (d) none of these

(v) The fusion of chlorobenzene with solid NaOH gives

(a) benzene (b) benzoic acid

(c) No reaction (d) Phenol

Q3. From the following options of assertion and reason select the correct option.

(A) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.

(B) Both assertion and reason are correct statements but reason is not the correct explanation of the assertion

(C) Assertion is correct, but reason is wrong statement.

(D) Assertion is wrong, but reason is correct statement.

(i) Assertion; In vulcanization sulphur crosslinks are introduced.

Reason; It is a free radical initiated chain reactions.

(ii)Assertion; Chloroform is heavier than water.

Reason; H atom of chloroform is basic.

(iii) Assertion; Thermoplastics are three dimensional polymers.

Reason; Crosslinks are present in thermoplastics

(iv) Assertion; Bakelite is a thermosetting polymers

Reason; It can be melted again and again without any change

(v) Assertion; polar solvent slows down SN_2 reaction

Reason; CH_3Br is less reactive than ; CH_3Cl

Q4. What are ambident nucleophiles? Explain with an example.

Q5. How is Nylon 6, 6 different from Nylon 6?

Q6. What is the difference between a homopolymer and a copolymer?

Q7. Complete the following reactions;

(i) $CH_3CH_2CH=CH_2 + HBr \xrightarrow{\text{Peroxide}}$

(ii) $CH_3CH=C(CH_3)_2 + HBr \longrightarrow$

Q8. Arrange the compounds of each set in order of reactivity towards SN2 displacement:

(i) 2-Bromo-2-methylbutane, 1-Bromopentane, 2-Bromopentane

(ii) 1-Bromo-3-methylbutane, 2-Bromo-2-methylbutane, 3-Bromo-2- methylbutane

Q9. In which classes, the polymers are classified on the basis of molecular forces?

Q10. Write the free radical mechanism for the polymerisation of ethene.

Q11. Out of $C_6H_5CH_2Cl$ and $C_6H_5CHClC_6H_5$, which is more easily hydrolysed by aqueous KOH?

Q12. How the following conversions can be carried out?

(i) Benzene to diphenyl

(ii) *tert*-Butyl bromide to isobutyl bromide

(iii) Aniline to phenylisocyanide

Q13 Write the name and the structure of monomers used for getting the following polymers.

(i) Polyvinyl chloride

(ii) Teflon

(iii) Bakelite

Q14. The treatment of alkyl chlorides with aqueous KOH leads to the formation of alcohols but in the presence of alcoholic KOH, alkenes are major products. Explain.

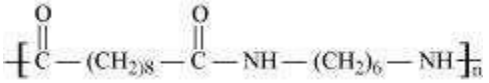
Q15. What happens when

(i) n-butyl chloride is treated with alcoholic KOH.

(ii) bromobenzene is treated with Mg in the presence of dry ether.

Q16. Write the names of monomers of the following polymers:

(i)



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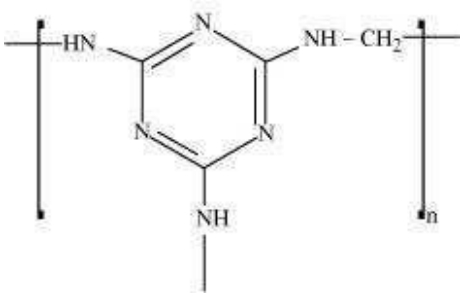


Q17.Write the reaction involved in following naming reaction.

(i) Wurtz Fittig (ii) Fittig (iii) Sandemeyers

Q18. Name the following halides according to IUPAC system and classify them as alkyl, allyl, benzyl (primary, secondary, tertiary), vinyl or aryl halides:

(i) $(CH_3)_2CHCH(Cl)CH_3$

(ii) $CH_3CH_2CH(CH_3)CH(C_2H_5)Cl$

(iii) $CH_3CH_2C(CH_3)_2CH_2I$

(iv) $(CH_3)_3CCH_2CH(Br)C_6H_5$

(v) $CH_3CH(CH_3)CH(Br)CH_3$

Q19. Write the free radical mechanism for the polymerisation of ethane with all chemical reactions involved.

Q20. Discuss the main purpose of vulcanisation of rubber with the help of structure.

Q21. Write the names and structures of the monomers of the following polymers:

(i) Buna-S (ii) Buna-N

(iii) Dacron (iv) Neoprene (v) Melamine

Q22. Write the structures of the following organic halogen compounds.

(i) 2-Chloro-3-methylpentane (ii) *p*-Bromochlorobenzene

(iii) 1-Chloro-4-ethylcyclohexane (iv) 2-(2-Chlorophenyl)-1-iodooctane

(v) Perfluorobenzene

Q23. Explain why

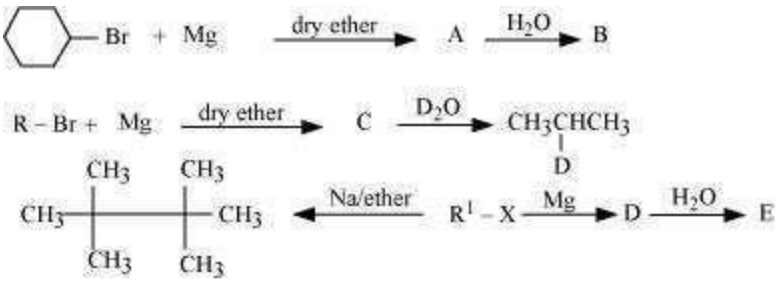
(i) the dipole moment of chlorobenzene is lower than that of cyclohexyl chloride?

(ii) alkyl halides, though polar, are immiscible with water?

(iii) Grignard reagents should be prepared under anhydrous conditions?

Q24. Primary alkyl halide C4H9Br (a) reacted with alcoholic KOH to give compound (b). Compound (b) is reacted with HBr to give (c) which is an isomer of (a). When (a) is reacted with sodium metal it gives compound (d), C8H18 which is different from the compound formed when n-butyl bromide is reacted with sodium. Give the structural formula of (a) and write the equations for all the reactions.

Q25. Identify A, B, C, D, E, R and R1 in the following:



Q26. How is dacron obtained from ethylene glycol and terephthalic acid?

Q27. Differentiate between the following (3 points with example)

(i) HDP and LDP

(ii) Homopolymer and Copolymer

(iii) Addition and Condensation polymer

Q28.How the following conversions can be carried out?

(i) Propene to propan-1-ol

(ii) Ethanol to but-1-yne

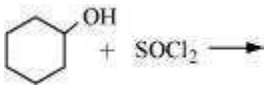
(iii) 1-Bromopropane to 2-bromopropane

(iv) Toluene to benzyl alcohol

(v) Benzene to 4-bromonitrobenzene

Q29. Draw the structures of major monohalo products in each of the following reactions:

(i)



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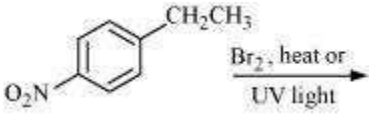

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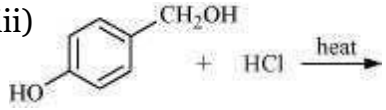

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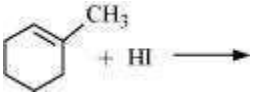

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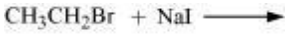
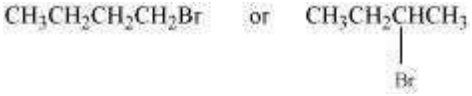


Q30. Which alkyl halide from the following pairs would you expect to react more rapidly by an SN2 mechanism? Explain your answer.

(i)



(ii)