CHEMISTRY HOLIDAY HOMEWORK FOR CLASS XII- 2019-20

I. Investigatory Project

Prepare an investigatory project of chemistry which should be experiment based. It should be a research based project where every aspect of the topic selected should be discussed in terms of chemistry. The project should have the following key aspects:

- Certificate
- Acknowledgement
- Why this was selected? (related to daily life)
- Introduction
- Details of the project(research related to the topic)
- Experiment (detailed manner including procedure)
- Observations
- Analysis
- Result
- Bibliography (mention the links)

  Project should be aesthetically prepared. No print out of content is allowed, only data or pictures can be printed. It has to be first approved.

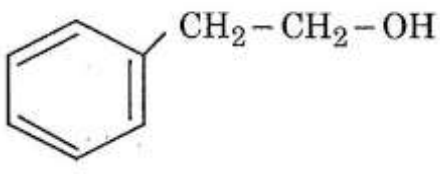
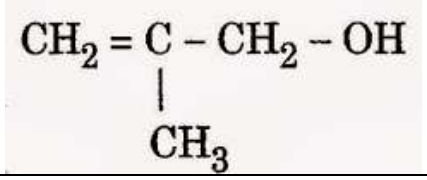
II. Complete the assignment and back exercise questions of the chapters 10-14 in your notebook. Assignments are already provided to you.

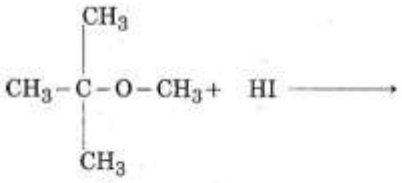
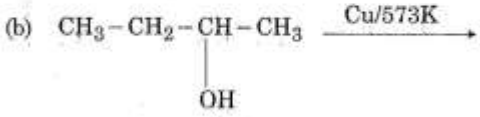
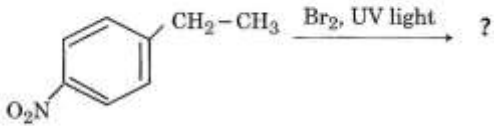
III. Attempt both sets of May assessment paper in chemistry notebook only.

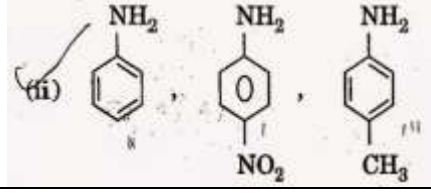
IV. Practice for the following topics in chemistry notebook:

a) Nomenclature (30 organic compounds)
b) Mechanisms done in organic
c) Minimum 15 pairs of compounds for distinguishing between covering all the chemical tests done(Hinsberg, Lucas, Carbylamine, Iodoform, 2,4-DNP , Neutral $FeCl_3$ test, bromine water test, Tollens' Test, Fehling Test etc)
d) Complete the reactions (minimum 20)
e) Word problems (minimum 10)

V. Attempt all the below given CBSE board questions in your notebook.

V	**CBSE BOARD PAPER QUESTIONS**
1	Write the structure of an isomer of compound C_4H_9Br which is most reactive towards S_N1 reaction.
2	Write the IUPAC names for the following-  

3	Complete the following reactions- (a)  (b)  (c) $C_6H_5-OH \xrightarrow[(ii)]{(i)\ CHCl_3 + aq.NaOH,\ H^+}$
4	Give reasons for the following : (i) Aniline does not undergo Friedal-Crafts reaction. (ii) $(CH_3)_2$ NH is more basic than $(CH_3)_3$ N in an aqueous solution. (iii) Primary amines have higher boiling point than tertiary amines.
5	Write the major product(s) in the following : (i)  (ii) $2CH_3-\underset{\underset{Cl}{|}}{CH}-CH_3 \xrightarrow[dry\ ether]{Na}$ (iii) $CH_3-CH_2-Br \xrightarrow{AgCN}$?
6	(i) Write the structural difference between starch and cellulose. (ii) What type of linkage is present in Nucleic acids ? (iii) Give one example each for fibrous protein and globular protein.

7	(a) Write the structures of A and B in the following reactions : (i) $CH_3COCl \xrightarrow{H_2, Pd-BaSO_4} A \xrightarrow{H_2N-OH} B$ (ii) $CH_3MgBr \xrightarrow[2.\ H_3O^+]{1.\ CO_2} A \xrightarrow{PCl_5} B$ (b) Distinguish between : (i) $C_6H_5-COCH_3$ and C_6H_5-CHO (ii) CH_3COOH and $HCOOH$ (c) Arrange the following in the increasing order of their boiling points : CH_3CHO, CH_3COOH, CH_3CH_2OH
8	(a) Write the chemical reaction involved in Wolff-Kishner reduction. (b) Arrange the following in the increasing order of their reactivity towards nucleophilic addition reaction : $C_6H_5COCH_3$, CH_3-CHO, CH_3COCH_3 (c) Why carboxylic acid does not give reactions of carbonyl group ? (d) Write the product in the following reaction $CH_3CH_2CH=CH-CH_2CN \xrightarrow[2.\ H_2O]{1.\ (i-Bu)_2AlH}$ (e) A and B are two functional isomers of compound C_3H_6O. On heating with NaOH and I_2, isomer B forms yellow precipitate of iodoform whereas isomer A does not form any precipitate. Write the formulae of A and B.
9	Which would undergo S_N1 reaction faster in the following pair : CH_3-CH_2-Br and $CH_3-\underset{\displaystyle Br}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-CH_3$
10	Arrange the following in increasing order of their basic strength : (i) $C_6H_5-NH_2$, $C_6H_5-CH_2-NH_2$, $C_6H_5-NH-CH_3$ (ii) 

11	Write the structure of the major product in each of the followi reactions : (i) $CH_3-CH=\underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}-CH_3 + HBr \longrightarrow$ (ii) $CH_3-CH_2-CH_2-\underset{\displaystyle Br}{\overset{\displaystyle |}{CH}}-CH_3 + KOH \xrightarrow{\text{ethanol/heat}}$ (iii)  $+ CH_3Cl \xrightarrow{\text{anhyd. } AlCl_3}$
12	Give reasons for the following : (i) Phenol is more acidic than ethanol. (ii) Boiling point of ethanol is higher in comparison to methoxymethane. (iii) $(CH_3)_3C-O-CH_3$ on reaction with HI gives CH_3OH and $(CH_3)_3C-I$ as the main products and not $(CH_3)_3C-OH$ and CH_3I.
13	How do you convert the following : (i) $C_6H_5CONH_2$ to $C_6H_5NH_2$ (ii) Aniline to phenol (iii) Ethanenitrile to ethanamine
14	Write the chemical equations involved when aniline is treated with the following reagents : (i) Br_2 water (ii) $CHCl_3 + KOH$ (iii) HCl
15	(i) Write the product obtained when D-glucose reacts with H_2N-OH. (ii) Amino acids show amphoteric behaviour. Why ? (iii) Why cannot vitamin C be stored in our body ?

16	(a) A compound 'A' of molecular formula C_2H_3OCl undergoes a series of reactions as shown below. Write the structures of A, B, C and D in the following reactions : $(C_2H_3OCl)\ A \xrightarrow{H_2/Pd-BaSO_4} B \xrightarrow{\text{dil. NaOH}} C \xrightarrow{\text{Heat}} D$ (b) Distinguish between the following : (i) $C_6H_5-COCH_3$ and C_6H_5-CHO (ii) Benzoic acid and methyl benzoate (c) Write the structure of 2-methylbutanal.
17	(a) Write the structures of the main products when acetone $(CH_3-CO-CH_3)$ reacts with the following reagents : (i) Zn – Hg/conc. HCl (ii) $H_2N-NHCONH_2/H^+$ (iii) CH_3MgBr and then H_3O^+ (b) Arrange the following in the increasing order of their boiling points : $C_2H_5OH,\ CH_3-CHO,\ CH_3-COOH$ (c) Give a simple chemical test to distinguish between the following pair of compounds : CH_3CH_2CHO and $CH_3CH_2COCH_3$
18	Following compounds are given to you: 2-Bromopentane, 2-Bromo-2-methylbutane , 1-Bromopentane i) Write the compound which is most reactive towards SN2 reaction? ii) Write the compound which is optically active ? iii) Write the compound which is most reactive towards β-elimination reaction
19	Identify A, B and C i) $CH_3Br \xrightarrow{Mg/\text{dry ether}} A \xrightarrow{a)CO_2,\ b)H_3O^+} B \xrightarrow{PCl_5} C$ ii) $CH_3CN \xrightarrow{a)SnCl_2/HCl\ ,\ b)\ H_3O^+} A \xrightarrow{\text{dil NaOH}} B \xrightarrow{\text{Heat}} C$
20	Give reasons- a) Acetylation of aniline reduces its activation effects b) Although –NH2 group is o/p directing yet aniline on nitration gives a significant amount of m-nitroaniline. c) CH3NH2 is more basic than C6H5NH2,.

The entire holiday homework is to be submitted in the first week of July.