1. The products formed in the following reaction

$C_6H_5-O-CH_3+HI \xrightarrow{\text{heat}}$ are

(a) C_6H_5-I and CH_3-OH

(b) C_6H_5-OH and CH_3-I

(c) $C_6H_5-CH_3$ and HOI

(d) C_6H_6 and CH_3OI

2. A substance $C_4H_{10}O$ yields on oxidation a compound C_4H_8O which gives an oxime and a positive iodoform test. The original substance on treatment with conc. H_2SO_4 gives C_4H_8. The structure of the compound is

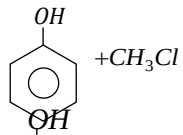
(a) $CH_3CH_2CH_2CH_2OH$

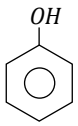
(b) $CH_3CH(OH)CH_2CH_3$

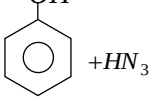
(c) $(CH_3)_3COH$

(d) $CH_3CH_2-O-CH_2CH_3$

3. In Friedal-Crafts acylation, besides $AlCl_3$, the other reactants are

(a)  $+CH_3Cl$

(b)  $+CH_3COCl$

(c)  $+HN_3$

(d)  $+CH_3Cl$

4. Ethyl alcohol is heated with conc. H_2SO_4. The product formed is

(a) $CH_3-\overset{\overset{O}{\|}}{C}-OC_2H_5$ (b) C_2H_6

(c) C_2H_4 (d) C_2H_2

5. Which alcohol reacts with fatty acids to form fats

(a) Ethanol (b) Glycerol

(c) Methanol (d) Isopropanol

6. Which of the following compound is most acidic

(a) CH_4 (b) C_2H_6

(c) $CH\equiv CH$ (d) C_2H_5OH

7. In which of the following reactions carbon carbon bond formation takes place

(a) Cannizzaro (b) Reimer-Tiemann

(c) HVZ reaction (d) Schmidt reaction

8. Cresol is

(a) A mixture of three cresols with little phenol

(b) Used as dye for wood

(c) A soapy solution of cresols

(d) Having an aldehyde group

9. Rectified spirit is a mixture of

(a) 95% ethyl alcohol + 5% water

(b) 94% ethyl alcohol + 4.53% water
(c) 94.4% ethyl alcohol + 5.43 % water
(d) 95.57% ethyl alcohol + 4.43% water

10. Denatured spirit is mainly used as a
(a) Good fuel
(b) Drug
(c) Solvent in preparing varnishes
(d) Material in the preparation of oil

11. Tonics in general contain
(a) Ether (b) Methanol
(c) Ethanol (d) Rectified spirit

12. Ether can be used
(a) As a general anaesthetic (b) As a refrigerant
(c) In perfumery (d) All of these

13. Glycerol boils at $290^{o}C$ with slight decomposition. Impure glycerine can be purified by
(a) Steam distillation (b) Simple distillation
(c) Vacuum distillation (d) Extraction with a solvent

14. Distinction between primary, secondary and tertiary alcohol is done by
(a) Oxidation method
(b) Lucas test
(c) Victor Meyer method
(d) All of these

15. In the following groups

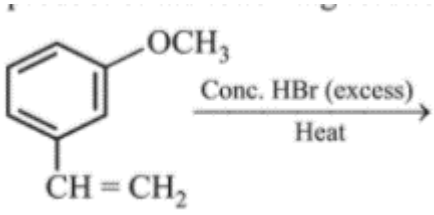
$-OAc$	$-OMe$	$-OSO_2Me$	$-OSO_2CF_3$
I	II	III	IV

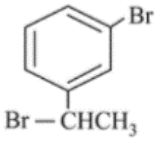
The order of leaving group ability is
(a) I > II > III > IV
(b) IV > III > I > II
(c) III > II > I > IV
(d) II > III > IV > I

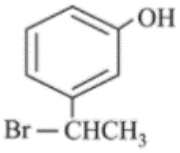
16. The best reagent to convert pent-3-en-2-ol into pent-3-in-2-one is
(a) Acidic permanganate
(b) Acidic dichromate
(c) Chromic anhydride in glacial acetic acid
(d) Pyridinium chloro-chromate

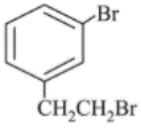
17. The correct order of the solubility of the different alcohols in water is
(a) *n*-propyl alcohol > ethyl alcohol > *n*-butyl alcohol
(b) Ethyl alcohol > *n*-butyl alcohol > *n*-propyl alcohol
(c) *n*-butyl alcohol > *n*-propyl alcohol > ethyl alcohol
(d) Ethanol > *n*-propanol > *n*-butyl alcohol

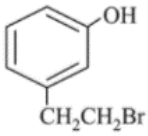
18. The major product of the following reaction is:



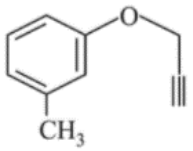
(a) 

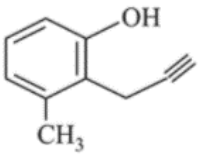
(b) 

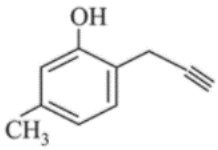
(c) 

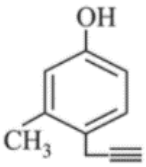
(d) 

19. What will be the major product when m-cresol is reacted with propargyl bromide ($HC \equiv C - CH_2Br$) in presence of K_2CO_3 in acetone?

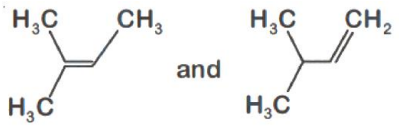
(a) 

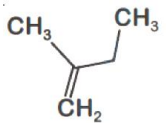
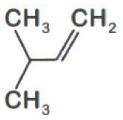
(b) 

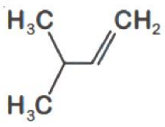
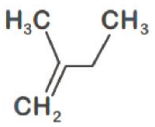
(c) 

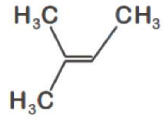
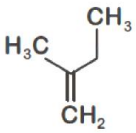
(d) 

20. When neopentyl alcohol is heated with an acid, it slowly converted into an 85: 15 mixture of alkenes A and B, respectively. What are these alkenes?

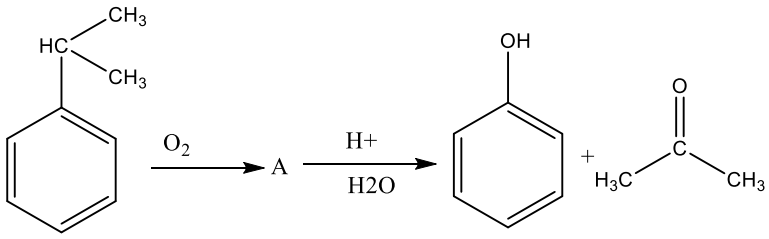
(a)  and

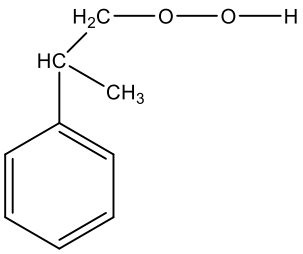
(b)  and 

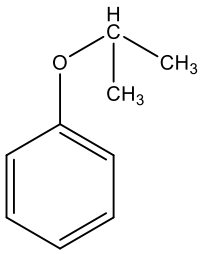
(c)  and 

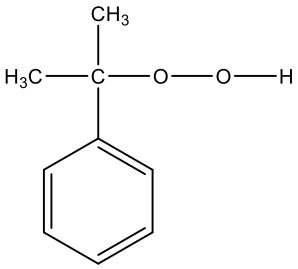
(d)  and 

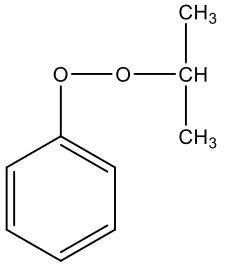
21. The structure of intermediate *A* in the following reaction is



(a) 

(b) 

(c) 



(d)

22. Which of the following reaction(s) can be used for the preparation of alkylhalides?.

(I) $CH_3CH_2OH + HCl \xrightarrow{Anh.ZnCl_2}$

(II) $CH_3CH_2OH + HCl \rightarrow$

(III) $(CH_3)_3COH + HCl \rightarrow$

(IV) $(CH_3)_2CHOH + HCl \xrightarrow{Anh.ZnC1_2}$

(a) (1) and (11) only

(b) (IV) only

(c) (111) and (1V) only

(d) (I), (III) and (IV) only (*2015*)

23. Given are cyclohexanol (I), acetic acid (II), 2,4,6 - trinitrophenol (III) and phenol (IV). In these the order of decreasing acidic character will be

(a) $III > II > IV > I$

(b) $II > III > I > IV$

(c) $II > III > IV > I$

(d) $III > IV > II > I$ (*2010*)

24. In the reaction: $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2 - O - CH_2 - CH_3 + HI \xrightarrow{Heated}$ which of the following compounds will be formed?.

(a) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_3 + CH_3CH_2OH$

(b) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2OH + CH_3CH_3$

(c) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2OH + CH_3CH_2I$

(d) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - CH_2 - I + CH_3CH_2OH$ (*2007*)

25. Ethyl chloride is converted into diethyl ether by

(a) Perkins reaction

(b) Grignard reaction

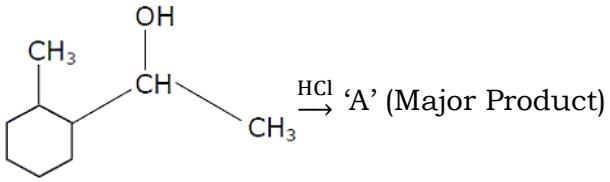
(c) Wurtz synthesis

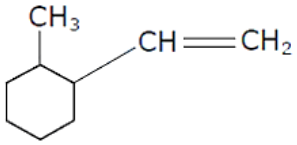
(d) Williamson's synthesis. (1999)

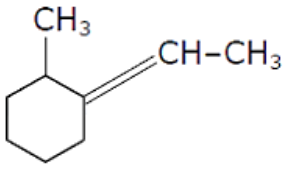
26. HBr reacts fastest with
(a) $2-methylpropan-1-ol$
(b) $methylpropan-2-ol$
(c) $propan-2-ol$
(d) $propan\text{-}1\text{-}ol$.(*1992*)

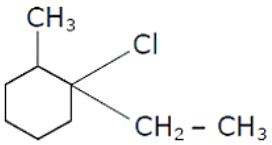
27. Propene, $CH_3CH=CH_2$ can be converted into 1 - propanol by oxidation. Indicate which set ofreagents amongst the following is ideal for the above conversion?.
(a) $KMnO_4$ (alkaline)
(b) Osmium tetroxide (OsO_4/CH_2Cl_2)
(c) B_2H_6 and $alk.H_2O_2$
(d) O_3/Zn (1989)

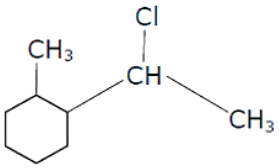
28. Which is the final product (major) 'A' in the given reaction?



(a) 

(b) 

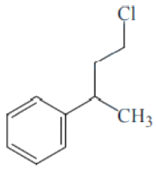
(c) 

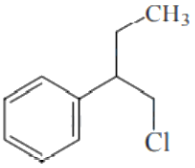
(d) 

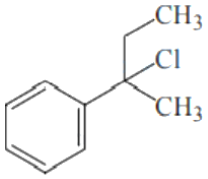
29. $\underset{(C_4H_8Cl_2)}{A} \xrightarrow[373K]{\text{Hydrolysis}} \underset{(C_4H_8O)}{B}$
B reacts with Hydroxyl amine but does not give Tollen's test. Identify A and B.
(a) 1, 1-Dichlorobutane and 2-Butanone
(b) 2, 2- Dichlorobutane and Butan-2-one
(c) 2,2 - Dichlorobutane and Butanal
(d) 1,1 - Dichlorobutane and Butanal

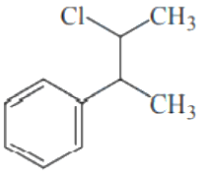
30. Reaction of Grignard reagent, C_2H_5MgBr with C_8H_8Ofollowed hy hydrolysis gives compound "A" whichreacts instantly with Lucas reagent to give compound $B, C_{10}H_{13}Cl$.

The Compound Bis:

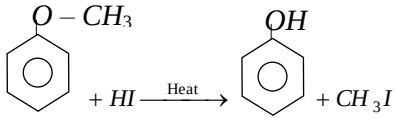
(a) 

(b) 

(c) 

(d) 

1. (b)



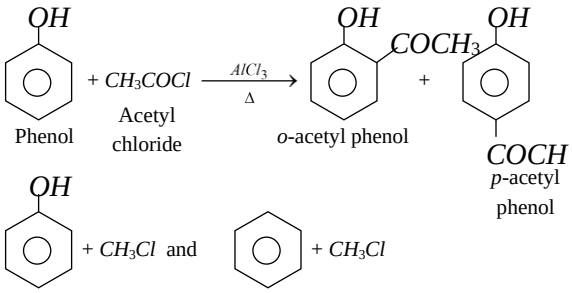
2. (b) $CH_3CH(OH)CH_2CH_3 \xrightarrow{\text{Conc. } H_2SO_4}$

$$CH_3CH=CHCH_3$$
$$(C_4H_8)$$

$$\underset{2-\text{Butanol}}{CH_3CHOHCH_2CH_3} \xrightarrow{[O]} \underset{\text{Butanone}}{CH_3COCH_2CH_3}$$

Butanone gives both an oxime and positive iodoform test, therefore, the original compound is 2-butanol.

3. (b) In friedal craft acylation, aromatic compounds such as benzene, phenol etc. undergo acylation with CH_3COCl in the presence of anhydrous $AlCl_3$ and gives ortho and para derivatives. Intermediate is $CH_3C^+=O$ (acylium ion) of this reaction.



In fact denotes friedel craft alkylation.

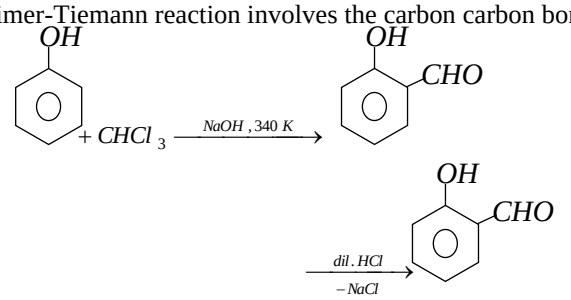
4. (a) Ethyl alcohol on dehydration with conc. H_2SO_4 at 170°C gives ethylene.

$$\underset{\text{Ethyl alcohol}}{CH_3CH_2OH} \xrightarrow[\text{conc. } H_2SO_4]{170\,^\circ C} \underset{\text{Ethylene}}{CH_2=CH_2} + H_2O$$

5. (b)

6. (d)

7. (b)Reimer-Tiemann reaction involves the carbon carbon bond formation.



salicylaldehyde

8. (a)

9. (d)

10. (c)

11. (c)Tonics have generally contains ethyl alcohol.

12. (d)

13. (c)The liquids which decompose at its boiling point can be purified by vacuum distillation. Glycerol which decomposes at its boiling point (–563*K*) can be distilled without decomposition at 453*K* under 12*mm Hg* pressure.

14. (d) Distinction between primary, secondary and tertiary alcohol is done by all three methods : oxidation, Victormeyer and Lucas test.

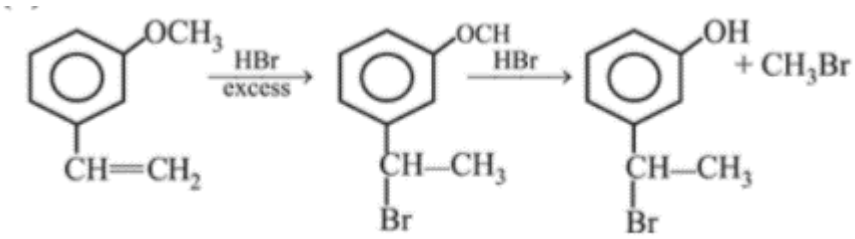
15. (b) IV > III > I > II.

16. (c)Chromic anhydride in glacial acetic acid is the best reagent to convert pen-3-en-2-ol into pent-3-in-2-one.

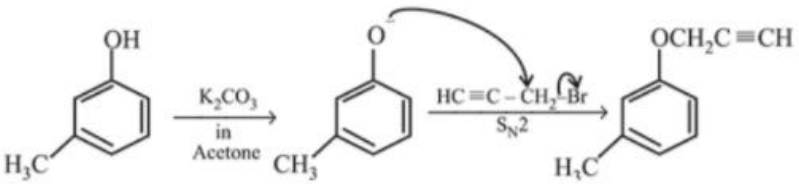
17. (d)Ethanol > *n*-propanol > *n*-butyl alcohol

Solubility of alcohols in water decreases as the size of alkyl group increases because tendency to form hydrogen bonding decreases.

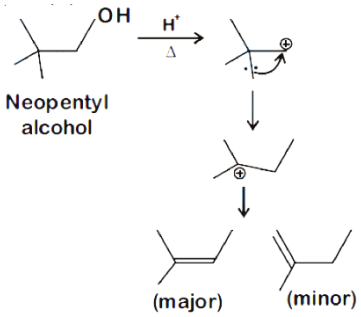
18. (b) **JEE Main 2019**



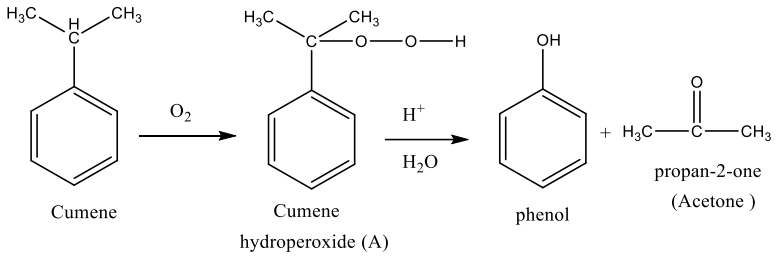
19. (a) **JEE Main 2019**



20. (d)JEE Main 2020



21. (c) :



22. (d): 1o and 2o alcohols react with HC1 in presence of anhydrous $ZnCl_2$ as catalyst while in case of 3o alcohols $ZnCl_2$ is not required.

23. (a): III $> II > IV > I$

Since, phenols and carboxylic acids are more acidic than aliphatic alcohols, we find that cyclohexanol (I) is least acidic. Out of the two given phenols, III is more acidic than IV This is because of the presence of three highly electron withdrawing $-NO_2$ groups on the benzene ring which makes the $O-H$ bond extremely polarized. This facilitates the release of H as H^+. Thus, III $> IV$

In acetic acid, the electron withdrawing $-\overset{O}{\overset{\|}{C}}-$ in the $-COOH$ group polarises the $O-H$ bond and increases the acidic strength. Acetic acid is therefore more acidic than phenol or cyclohexanol.

$\therefore$ The order is $III > II > IV > I$.

24. (c): The alkyl iodide produced depends on the nature ofthe $alk\gamma 1$ groups. If one group is Me and the other a primary or secondary alkyl group, it is methyl iodide which is produced. This can be explained on the assumption that the mechanism is $S_N 2$, and because of the steric effect of the larger group, I^- attacks the smaller methyl group.

When the substrate is a methyl t - alkyl ether, the products are t - RI and MeOH. This can be explained by an $S_N 1$ mechanism, the carbonium ion produced being the $t-alk)^{\gamma}1$ since tertiary carbonium ion is more stable than a primary or secondary carbonium ion.

25. (d): $C_2H_5-Cl+Na-O-C_2H_5 \rightarrow C_2H_5-O-C_2H_5+NaCl$

The above reaction is called as Williamson' s synthesis.

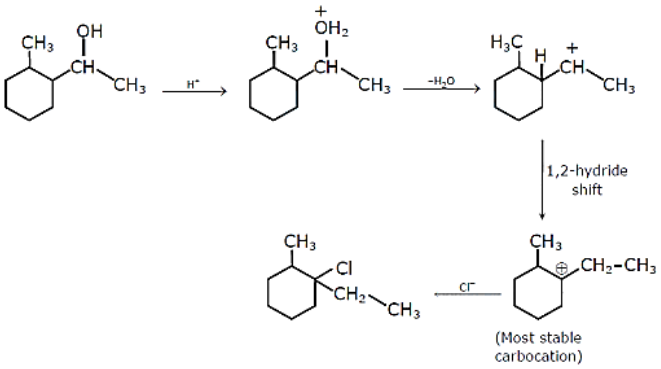
26. (b) : $CH_3-\underset{OH}{\overset{CH_3}{C}}-CH_3$' generates 3^o carbocation OH

which is very stable intermediate, thus it will react more rapidly with HBr.

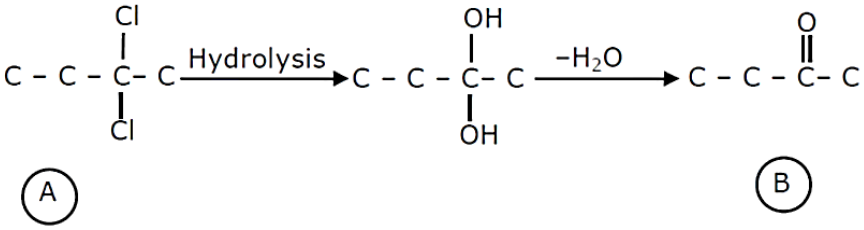
27. (c) :

$$CH_3CH=CH_2 \xrightarrow[Hydroboration]{BH_3,THF} \underset{Tripropyl\ borane}{(CH_3CH_2CH_2)_3B} \xrightarrow[OH^-]{H_2O_2} 3\underset{Propan-1-ol}{CH_3CH_2CH_2OH}$$

28. (c) JEE Main 2021



29. (d) JEE Main 2021



Compound 'B' does not gives Tollen's test due to presence of kenotic group but react with hydroxyl amine.

30. c JEE Main 2021