DPP - Daily Practice Problems

Date : | **Start Time :** | **End Time :**

CHEMISTRY CC25

SYLLABUS : Alcohols, Phenols and Ethers

Max. Marks : 120 **Marking Scheme :** + 4 for correct & (–1) for incorrect **Time : 60 min.**

INSTRUCTIONS : This Daily Practice Problem Sheet contains 30 MCQ's. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.

1. Lucas reagent is
(a) Conc. HCl and anhydrous $ZnCl_2$
(b) Conc. HNO_3 and hydrous $ZnCl_2$
(c) Conc. HCl and hydrous $ZnCl_2$
(d) Conc. HNO_3 and anhydrous $ZnCl_2$

2. Diethyl ether reacts, inspite of its usual inert nature, with :
(a) Dilute suphuric acid
(b) Dilute sodium hydroxide
(c) Boron trifluoride
(d) Metallic sodium

3. Vinyl carbinol is
(a) $HO-CH_2-CH=CH_2$
(b) $CH_3C(OH)=CH_2$
(c) $CH_3-CH=CH-OH$
(d) $CH_3-C(CH_2OH)=CH_2$

4. Among the following compounds which can be dehydrated very easily is
(a) $CH_3CH_2-\underset{\displaystyle OH}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}-CH_2CH_3$
(b) $CH_3CH_2CH_2\overset{\displaystyle OH}{\overset{|}{C}}HCH_3$
(c) $CH_3CH_2CH_2CH_2CH_2OH$
(d) $CH_3CH_2\underset{\displaystyle CH_3}{\overset{|}{C}}HCH_2CH_2OH$

RESPONSE GRID	1. ⓐⓑⓒⓓ	2. ⓐⓑⓒⓓ	3. ⓐⓑⓒⓓ	4. ⓐⓑⓒⓓ

5. CH_3CH_2OH can be converted into CH_3CHO by _____
   (a) catalytic hydrogenation
   (b) treatment with $LiAlH_4$
   (c) treatment with pyridinium chlorochromate
   (d) treatment with $KMnO_4$

6. Epichlorohydrin is
   (a) 3-Chloropropane
   (b) 3-Chloropropan-1-ol
   (c) 3-Chloro-1, 2-epoxypropane
   (d) None of these

7. 2-Phenylethanol may be prepared by the reaction of phenylmagnesium bromide with
   (a) HCHO
   (b) CH_3CHO
   (c) CH_3COCH_3
   (d) 

8. HBr reacts with $CH_2 = CH - OCH_3$ under anhydrous conditions at room temperature to give
   (a) $BrCH_2 - CH_2 - OCH_3$
   (b) $H_3C - CHBr - OCH_3$
   (c) CH_3CHO and CH_3Br
   (d) $BrCH_2CHO$ and CH_3OH

9. From amongst the following alcohols the one that would react fastest with conc. HCl and anhydrous $ZnCl_2$, is
   (a) 2-Butanol
   (b) 2- Methylpropan-2-ol
   (c) 2-Methylpropanol
   (d) 1- Butanol

10. Which of the following cannot be made by using Williamson's synthesis?
   (a) Methoxybenzene
   (b) Benzyl p-nitrophenyl ether
   (c) Methyl tertiary butyl ether
   (d) Di-tert-butyl ether

11. 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) 95.87% ethyl alcohol + 4.13% water

12. Absolute alcohol (100% alcohol) is prepared by distilling rectified spirit over
   (a) Na
   (b) $CaCl_2$
   (c) Mg
   (d) $Mg(OC_2H_5)_2$

13. Reagent used to convert allyl alcohol to acrolein is
   (a) MnO_2
   (b) H_2O_2
   (c) OsO_4
   (d) $KMnO_4$

14. In Williamson synthesis of mixed ether having a primary and a tertiary alkyl group if tertiary halide is used, then :
   (a) Rate of reaction will be slow due to slow cleavage of carbon-halogen bond.
   (b) Alkene will be the main product.
   (c) Simple ether will form instead of mixed ether.
   (d) Expected mixed ether will be formed.

RESPONSE GRID					
	5. ⓐⓑⓒⓓ	6. ⓐⓑⓒⓓ	7. ⓐⓑⓒⓓ	8. ⓐⓑⓒⓓ	9. ⓐⓑⓒⓓ
	10. ⓐⓑⓒⓓ	11. ⓐⓑⓒⓓ	12. ⓐⓑⓒⓓ	13. ⓐⓑⓒⓓ	14. ⓐⓑⓒⓓ

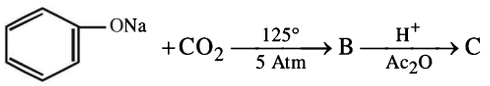
15. Arrange the following in increasing order of their acidity?
o–cresol(a), salicyclic acid(b), phenol(c)
(a) c < a < b (b) b < c < a
(c) a < b < a (d) a < c < b

16. Zerevitinov's determination of active hydrogen in a compound is based upon its reaction with
(a) Na (b) CH_3Mgl
(c) Zn (d) Al

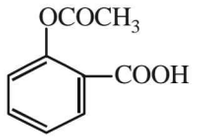
17. When wine is put in air, it becomes sour due to
(a) bacteria
(b) oxidation of C_2H_5OH to CH_3COOH
(c) virus
(d) formic acid formation

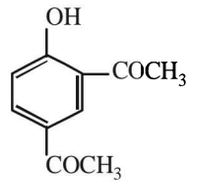
18. Osmium tetraoxide is a reagent used for
(a) hydroxylation of acetylenes
(b) hydroxylation of olefins to give *cis*-diols
(c) hydroxylation of olefins to form trans- diols
(d) hydroxylation of carbonyl compounds

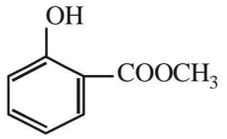
19. Sodium phenoxide when heated with CO_2 under pressure at 125°C yields a product which on acetylation produces C

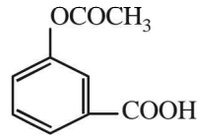


The major product C would be

(a) 

(b) 

(c) 

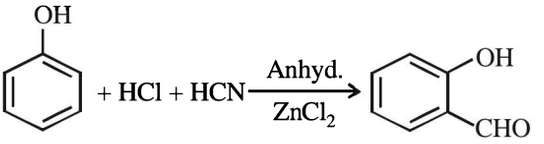
(d) 

20. Williamson's synthesis is used to prepare
(a) acetone (b) diethyl ether
(c) P.V.C. (d) bakelite

21. Aspirin is an acetylation product of
(a) p-Dihydroxybenzene
(b) o-Hydroxybenzoic acid
(c) o-Dihydroxybenzene
(d) m-Hydroxybenzoic acid

22. $o-\text{Xylene} \xrightarrow{HNO_3} X \xrightarrow[H_2SO_4]{\text{Phenol}} Y$. The product Y is
(a) Phthalic acid
(b) Isophthalic acid
(c) Phenolphthalein
(d) o-Hydroxysulphonic acid

23. The following reaction



is known as:
(a) Perkin reaction
(b) Gatterman-Koch Formylation
(c) Kolbe's reaction
(d) Gattermann reaction

24. Denaturation of alcohol is the
(a) mixing of $CuSO_4$ (a foul smelling solid) and pyridine (to give the colour) to make the commercial alcohol unfit for drinking
(b) mixing of $CuSO_4$ (to give the colour) and pyridine (a foul smelling solid) to make the commercial alcohol unfit for drinking
(c) mixing of $Cu(OAc)_2$ and ammonia to make the commercial alcohol unfit for drinking
(d) mixing of $Cu(OAc)_2$ and pyridine to make the commercial alcohol unfit for drinking

RESPONSE GRID					
	15. ⓐⓑⓒⓓ	**16.** ⓐⓑⓒⓓ	**17.** ⓐⓑⓒⓓ	**18.** ⓐⓑⓒⓓ	**19.** ⓐⓑⓒⓓ
	20. ⓐⓑⓒⓓ	**21.** ⓐⓑⓒⓓ	**22.** ⓐⓑⓒⓓ	**23.** ⓐⓑⓒⓓ	**24.** ⓐⓑⓒⓓ

- -

25. Formation of which compound given below from 1 - butanol needs an oxidising agent?

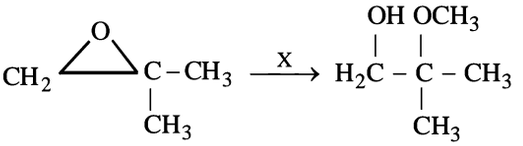
(a) $CH_3CH_2CH_2CH_2Br$

(b) $CH_3CH_2CH_2CH=O$

(c) $(CH_3CH_2CH_2CH_2)_2O$

(d) $CH_3-CH_2CH=CH_2$

26. What is X in the following reaction ?



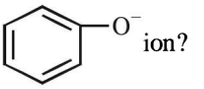
(a) CH_3OH, H_2SO_4

(b) $CH_3OH, CH_3O^-\overset{+}{Na}$

(c) H_2O/H_2SO_4 followed by CH_3OH

(d) CH_3MgBr / ether followed by H_3O^+

27. Which one of the following substituents at *para*-position is most effective in stabilizing the phenoxide



ion?

(a) $-CH_3$ (b) $-OCH_3$

(c) $-COCH_3$ (d) $-CH_2OH$

28. Williamson synthesis of ether is an example of:

(a) Nucleophilic addition

(b) Electrophilic addition

(c) Electrophilic substitution

(d) Nucleophilic substitution

29. Widespread deaths due to liquor poisoning occurs due to

(a) presence of carbonic acid in liquor

(b) presence of ethyl alcohol in liquor

(c) presence of methyl alcohol in liquor

(d) presence of lead compounds in liquor

30. Which of the following diols would cleave into two fragments with HIO_4

(a) 1, 3-hexanediol (b) 2, 4-hexanediol

(c) 1, 6-hexanediol (d) 3, 4-hexanediol

RESPONSE GRID	25. ⓐⓑⓒⓓ	26. ⓐⓑⓒⓓ	27. ⓐⓑⓒⓓ	28. ⓐⓑⓒⓓ	29. ⓐⓑⓒⓓ
	30. ⓐⓑⓒⓓ				

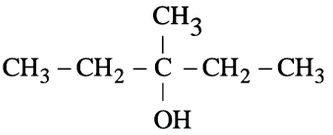
DAILY PRACTICE PROBLEM DPP CHAPTERWISE 25 - CHEMISTRY			
Total Questions	30	Total Marks	120
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	36	Qualifying Score	52
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

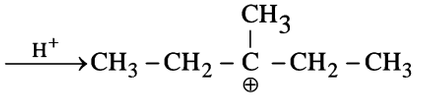
1. **(a)** Lucas reagent is conc. HCl + anhyd. $ZnCl_2$.

2. **(c)**

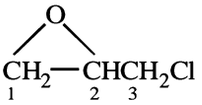
3. **(a)** Methyl alcohol (CH_3OH) is also known as carbinol. Hence vinyl carbinol is $CH_2 = CH - CH_2OH$

4. **(a)** 3-methyl pentanol-3 will be dehydrated most readily since it produces tertiary carbonium ion as intermediate.

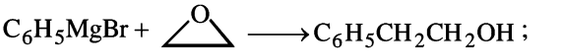




5. **(c)**

6. **(c)** 

7. **(d)** 2-Phenylethanol, $C_6H_5CH_2CH_2OH$, is a 1° alcohol which can be prepared from C_6H_5MgBr by treating with ethylene oxide (note that HCHO will introduce only one carbon atom, i.e. it will give $C_6H_5CH_2OH$ and not $C_6H_5CH_2CH_2OH$).

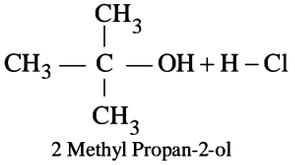


$C_6H_5MgBr + HCHO \longrightarrow C_6H_5CH_2OH$

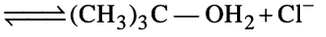
8. **(b)** Methyl vinyl ether under anhydrous condition at room temperature undergoes addition reaction.

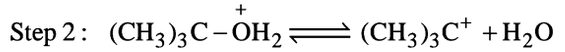
9. **(b)** Tertiary alcohols react fastest with conc. HCl and anhydrous $ZnCl_2$ (lucas reagent) as its mechanism proceeds through the formation of stable tertiary carbocation.

Mechanism

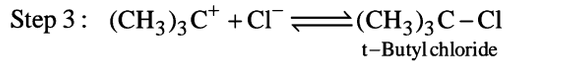


2 Methyl Propan-2-ol



Step 2 : 

3° Carbocation

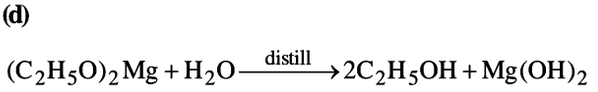
Step 3 : 

t–Butyl chloride

10. **(d)** The two components should be $(CH_3)_3CONa$ + $(CH_3)_3CBr$. However, tert-alkyl halides tend to undergo elimination reaction rather than substitution leading to the formation of an alkene, $Me_2C = CH_2$

11. **(d)**

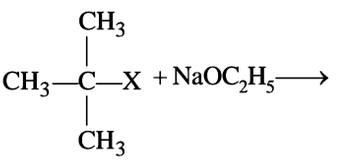
12. **(d)**

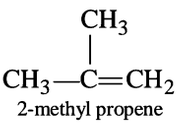


(distillate) (residue)

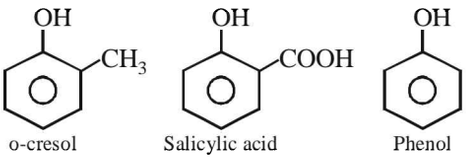
13. **(a)** MnO_2 being a mild oxidising agent stops the oxidation of – CH_2OH group at aldehyde stage.

14. **(b)** The tertiary alkyl halide undergo elimination reaction to give alkenes





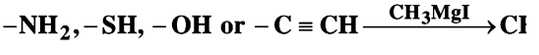
2-methyl propene

15. **(d)** 

o-cresol Salicylic acid Phenol

Electron releasing groups (–CH_3, –OCH_3, –NCH_3 etc) intensify the negative charge of phenoxide ion, i.e., destablises it hence decrease ionization of parent phenol. Therefore decreases acidity while electron donating groups (–NO_2, –COOH, –CHO etc.) increases acidity.

16. **(b)** Number of active hydrogen in a compound corresponds to the number of moles of CH_4 evolved per mole of the compound.

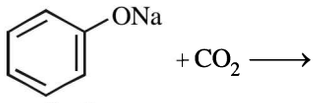


$CH_4 \uparrow$ ($2CH_4$ from $-NH_2$)

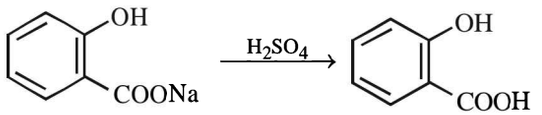
17. (b)

18. (b)

19. (a)

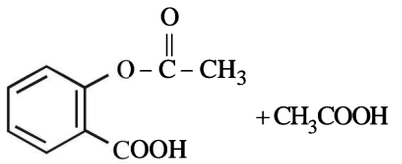


Sodium Phenoxide



Salicylic acid

$\downarrow (CH_3CO)_2O$

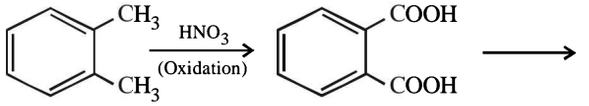


Aspirin
(Acetyl Salicylate)

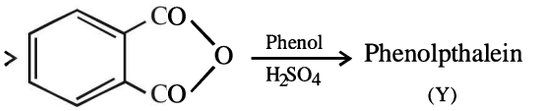
20. (b) $C_2H_5Br + C_2H_5ONa \xrightarrow[-NaBr]{} C_2H_5 - O - C_2H_5$
Sod. ethoxide — diethyl ether

21. (b)

22. (c)



o-Xylene



(Y)

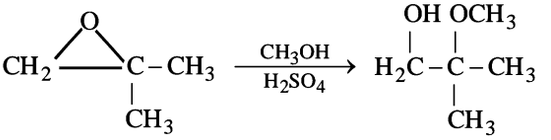
Phthalic anhydride, X

23. (b)

24. (b) The commercial alcohol is made unfit for drinking by mixing in it some copper sulphate (to give it colour) and pyridine (a foul smelling liquid). It is known as denaturation of alcohol.

25. (b) $CH_3CH_2CH_2CH_2OH \xrightarrow{\text{Oxidation}} CH_3CH_2.CH_2CHO$

26. (a)



27. (c) Electron withdrawing group stabilises the benzene ring due to delocalisation of charge.
$-CH_3$ and $-CH_2OH$ are electron donating group and hence decrease the stability of benzene ring $-OCH_3$ is weaker electron withdrawing group than $-COCH_3$. Hence $-COCH_3$ group more stabilize the phenoxide ion at *p*-position.

28. (d) This method is suitable for the preparation of a wide variety of unsymmetrical ethers. The nucleophilic substitution of halides with alkoxide leads to desired product.

29. (c) Due to presence of methyl alcohol in liquor.

30. (d) $CH_3 - CH_2 - \underset{OH}{CH} - \underset{OH}{CH} - CH_2 - CH_3 \xrightarrow{HIO_4}$

$2CH_3 - CH_2 - CHO$