



# INDIAN SCHOOL MUSCAT

## SECOND PERIODIC TEST

### CHEMISTRY

CLASS: XII

Sub. Code: 043

Time Allotted: 50mts.

01.06.2022

Max. Marks: 20

#### GENERAL INSTRUCTIONS:

- All questions are compulsory.*
- Mark for each question is indicated against the question.*

#### MULTIPLE CHOICE QUESTIONS

- The reagent that will convert carboxylic acid to alcohol is 1  
(a) Cu at 573K (b)  $\text{LiAlH}_4$  (c) PCC (d)  $\text{NaBH}_4$
- Which of the following cannot be cleaved by HI 1  
(a) Phenetole (b) Diphenylether (c) Di-tert-butylether (d) Dicyclohexyl ether
- Aniline on diazotization followed by hydrolysis gives 1  
(a) Benzene (b) Chlorobenzene (c) Bromobenzene (d) Phenol

**II. In the following questions, a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.**

- Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
- Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is *not* the correct explanation of the Assertion (A).
- Assertion (A) is correct, but Reason (R) is incorrect statement.
- Assertion (A) is incorrect, but Reason (R) is correct statement

4. Assertion: Cresols have lower pK<sub>a</sub> value than that of phenols. 1  
Reason: In cresols the presence of electron withdrawing group increases the acidic strength.
5. Assertion: Bond angle in ethers is slightly less than the tetrahedral angle. 1  
Reason: The steric repulsion between the alkyl groups in ethers is stronger than that of lone pair –lone pair repulsion.

FILL IN THE BLANKS

6. The major product formed on mononitration of phenyl ethanoate is \_\_\_\_\_. 1
7. The reaction of propanone with methyl magnesium bromide followed by hydrolysis gives \_\_\_\_\_. 1

ANSWER THE FOLLOWING QUESTIONS

8. Write the IUPAC name of ethyl sec-butyl ether 1
9. Write equation to show how would you synthesise 2-phenylethanol from a suitable alkene. 1
10. Give a chemical test to distinguish between ethanol and phenol. 1
11. Illustrate Kolbe's reaction. 1
12. Explain the following: 2  
(a) Bimolecular dehydration is not appropriate to prepare ethers with secondary and tertiary alkyl groups.  
(b) o-nitrophenol is more acidic than o-methoxyphenol
13. Write the major product(s) in the following: 2  
(a)  $\text{C}_6\text{H}_5\text{OC}_2\text{H}_5 + \text{HI} \rightarrow$   
(b) Phenol is treated with  $\text{CH}_3\text{COCl}$  in the presence of pyridine.
14. Convert the following: 2  
(a) Methanal to propan-1-ol  
(b) Phenol to 2,4,6-tribromophenol
15. Write the mechanism of acid dehydration of ethanol at 443 K. 3

**END OF THE QUESTION PAPER**



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**GENERAL INSTRUCTIONS:**

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**MULTIPLE CHOICE QUESTIONS**

1. Which one of the following alcohols is expected to have the lowest pKa value? 1  
(a) Ethanol (b) tert-butyl alcohol  
(c) isopropyl alcohol (d) isobutyl alcohol
2. Which among the following produces violet color when treated with neutral ferric chloride? 1  
(a) 2-Methylpropan-2-ol (b) Ethanol (c) Phenol (d) Propan-2-ol
3. The compound  $\text{CH}_3\text{COCH}_2\text{COOH}$  when treated with  $\text{NaBH}_4$  will give 1  
(a)  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{CH}_2\text{OH}$  (b)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$   
(c)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{COOH}$  (d)  $\text{CH}_3\text{CH}(\text{OH})\text{CH}_2\text{COOH}$

**II. In the following questions, a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.**

- A. Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
- B. Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is *not* the correct explanation of the Assertion (A).
- C. Assertion (A) is correct, but Reason (R) is incorrect statement.
- D. Assertion (A) is incorrect, but Reason (R) is correct statement

4. Assertion: Phenol gives a mixture of o- and p-nitrophenol on nitration with conc.HNO<sub>3</sub> 1  
Reason: —OH group in phenol is ortho-para directing.
5. Assertion: Bond angle in alcohols is slightly less than the tetrahedral angle. 1  
Reason: The lone pair lone pair repulsions are stronger than lone pair bond pair repulsions.

#### FILL IN THE BLANKS

6. The major product(s) formed on mononitration of 3-methyl phenol is \_\_\_\_\_ 1
7. The reaction of propanal with methyl magnesium bromide followed by hydrolysis gives \_\_\_\_\_ 1

#### ANSWER THE FOLLOWING QUESTIONS

8. Write the IUPAC name of isooctyl phenyl ether 1
9. Write equation to show how would you synthesise 2-phenylethanol from a suitable alkyl halide 1
10. Give a chemical test to distinguish between propan-2-ol and 2-Methylpropan-2-ol. 1
11. Illustrate Williamson synthesis using a suitable example 1
12. Explain the following: 2  
(a) Alcohols have much higher boiling points than ethers of similar molar mass.  
(b) Commercially, acids are converted to esters and then reduced to alcohols.
13. Write equations to show what happens when phenol is treated with 2  
(a) Acidified sodium dichromate  
(b) CH<sub>3</sub>COCl/Pyridine.
14. Effect the following conversions: 2  
(a) Aniline to phenol  
(b) Anisole to 4-Methoxytoluene
15. Write the mechanism of acid catalyzed dehydration of ethanol at 413 K 3

END OF THE QUESTION PAPER



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### GENERAL INSTRUCTIONS:

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### MULTIPLE CHOICE QUESTIONS

- What is the correct order of reactivity of alcohols in the following reaction? 1  

$$\text{R-OH} + \text{HCl} \xrightarrow{\text{ZnCl}_2} \text{R-Cl} + \text{H}_2\text{O}$$
  - $1^\circ > 2^\circ > 3^\circ$
  - $1^\circ < 2^\circ > 3^\circ$
  - $3^\circ > 2^\circ > 1^\circ$
  - $3^\circ > 1^\circ > 2^\circ$
- Reaction of 3-methylbutan-2-ol with HBr would give 1  
  - 2-Bromo-3-methylbutane
  - 2-Bromo-2-methylbutane
  - 2-Methylbut-1-ene
  - 2-Methylbut-2-ene
- Which of the following cannot be cleaved by HI 1  
  - Phenetole
  - Diphenylether
  - Di-tert-butylether
  - Dicyclohexyl ether

### II. In the following questions, a statement of assertion followed by a statement of reason is given.

Choose the correct answer out of the following choices.

- Both Assertion (A) and Reason (R) are correct statements, and Reason (R) is the correct explanation of the Assertion (A).
- Both Assertion (A) and Reason (R) are correct statements, but Reason (R) is **not** the correct explanation of the Assertion (A).
- Assertion (A) is correct, but Reason (R) is incorrect statement.
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4. Assertion: In aryl alkyl ethers the alkoxy group activates the benzene ring towards electrophilic substitution. 1  
Reason: It directs the incoming electrophiles to ortho and para positions in benzene ring
5. Assertion: o- and p-nitrophenols can be separated by steam distillation. 1  
Reason: para-isomer is steam volatile whereas ortho isomer is non-volatile in steam

#### FILL IN THE BLANKS

6. The major product formed on monobromination of phenyl ethanoate is \_\_\_\_\_. 1
7. The reaction of ethanal with isopropyl magnesium bromide followed by hydrolysis gives \_\_\_\_\_. 1

#### ANSWER THE FOLLOWING QUESTIONS

8. Write the IUPAC name of benzyl phenyl ether 1
9. Write equation to show how would you synthesise 1-phenylethanol from a suitable alkene. 1
10. Give a chemical test to distinguish between phenol and cyclohexanol. 1
11. Illustrate Reimer-Tiemann reaction. 1
12. Explain the following: 2  
(a) Alcohols are highly soluble in water whereas hydrocarbons of comparable molecular mass are almost insoluble.  
(b) Bimolecular dehydration is not appropriate to prepare ethers with secondary and tertiary alkyl groups.
13. Give equations of the following reactions : 2  
(a) Benzyl alcohol is treated with alkaline  $\text{KMnO}_4$  solution followed by acidification.  
(b) Phenol is treated with  $\text{CH}_3\text{COCl}$  in the presence of pyridine.
14. Convert the following : 2  
(a) Propanone to tert-butyl alcohol.  
(b) Benzene to phenol.
15. Write the mechanism of acidic dehydration ethanol at 413 K 3

END OF THE QUESTION PAPER