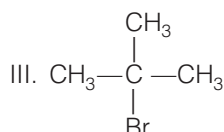
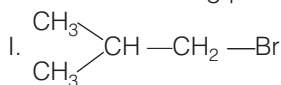


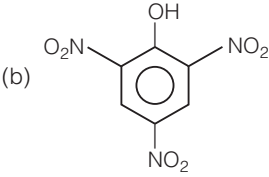
## DAY THIRTY SEVEN

# Unit Test 7

## (Organic Chemistry II)

- 1 Arrange the following compounds in the increasing order of their boiling points.



- (a)  $\text{II} < \text{I} < \text{III}$  (b)  $\text{I} < \text{II} < \text{III}$   
(c)  $\text{III} < \text{I} < \text{II}$  (d)  $\text{III} < \text{II} < \text{I}$
- 2 Which halide among the following is used as methylating agent?  
(a)  $\text{CH}_3\text{I}$  (b)  $\text{C}_2\text{H}_5\text{Br}$  (c)  $\text{C}_2\text{H}_5\text{Cl}$  (d)  $\text{C}_6\text{H}_5\text{Cl}$
- 3 Which of the following is not an antiseptic drug?  
(a) Iodoform (b) Dettol  
(c) Lindane (d) Gentian violet
- 4 Disadvantage of DDT as a pesticide is  
(a) It is not easily biodegradable  
(b) Its high cost  
(c) It becomes ineffective after some time  
(d) It is less effective than others
- 5 Reaction of  $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$  with aqueous sodium hydroxide follows [NCERT Exemplar]  
(a)  $\text{S}_{\text{N}}1$  mechanism  
(b)  $\text{S}_{\text{N}}2$  mechanism  
(c) any of the above two depending upon the temperature of reaction  
(d) Saytzeff rule
- 6 A set of compounds in which reactivity of halogen atoms in the ascending order is  
(a) chloroethane < chlorobenzene < vinyl chloride  
(b) chlorobenzene < vinyl chloride < chloroethane  
(c) vinyl chloride < chlorobenzene < chloroethane  
(d) vinyl chloride < chloroethane < chlorobenzene
- 7 Ethyl alcohol gives ethyl chloride with the help of  
(a)  $\text{SOCl}_2$  (b)  $\text{NaCl}$  (c)  $\text{Cl}_2$  (d)  $\text{KCl}$
- 8 Among the following, the one that gives positive iodoform test upon reaction, with  $\text{I}_2$  and  $\text{NaOH}$  is  
(a)  $\text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{CH}_3$  (b)  $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{OH}$   
(c)  $\begin{array}{c} \text{CH}_3 \\ \diagup \\ \text{CH} - \text{OH} \\ \diagdown \end{array}$  (d)  $\text{Ph}-\text{CHOHCH}_3$
- 9 The correct order of solubility of different alcohols in water is  
(a) ethyl alcohol > *n*-propyl alcohol > *n*-butyl alcohol  
(b) *n*-propyl alcohol > ethyl alcohol > *n*-butyl alcohol  
(c) ethyl alcohol > *n*-butyl alcohol > *n*-propyl alcohol  
(d) *n*-butyl alcohol > *n*-propyl alcohol > ethyl alcohol
- 10 In manufacture of ethanol from sugar, the enzymes are  
(a) diastase and zymase (b) maltase and zymase  
(c) diastase and invertase (d) invertase and zymase
- 11 Benzyl alcohol is obtained from benzaldehyde by  
(a) Fittig reaction (b) Clemmensen reduction  
(c) Kolbe's reaction (d) Reduction with  $\text{LiAlH}_4$
- 12 Which of the following compounds will not react with  $\text{NaOH}$ ?  
(a)  $\text{CH}_3\text{COOH}$  (b)   
(c)  $\text{C}_2\text{H}_5\text{OH}$  (d)  $\text{CH}(\text{CN})_3$
- 13 During dehydration of alcohols to alkenes by heating with concentrated  $\text{H}_2\text{SO}_4$ , the initiation step is  
(a) protonation of alcohol molecule  
(b) formation of carbocation  
(c) elimination of water  
(d) formation of an ester

**14** A fruity smell is produced by the reaction of  $C_2H_5OH$  with

- (a)  $PCl_5$  (b)  $CH_3COCH_3$   
(c)  $CH_3COOH$  (d) None of these

**15** The best reagent to convert pent-3-en-2-ol into pent-3-en-2-one is

- (a) pyridinium chloro chromate  
(b) acidic dichromate  
(c) chromic anhydride in glacial acetic acid  
(d) acidic permanganate

**16** Which of the following reagents may be used to distinguish between phenol and benzoic acid?

- (a) Aqueous NaOH (b) Tollen's reagent  
(c) Molisch reagent (d) Neutral  $FeCl_3$

**17** Phenol  $\xrightarrow{NaNO_2/H_2SO_4} B \xrightarrow{H_2O} C \xrightarrow{NaOH} D$

The above reaction is

- (a) Liebermann's reaction  
(b) Phthalein fusion test  
(c) Reimer-Tiemann reaction  
(d) Schotten-Baumann reaction

**18** Etherates are

- (a) ethers  
(b) solution in ether  
(c) complexes of ethers with Lewis acid  
(d) complexes of ethers with Lewis base

**19** Oxidation of toluene to benzaldehyde by the use of chromyl chloride is called

- (a) Wurtz reaction (b) Etard reaction  
(c) Fittig reaction (d) Rosenmund's reaction

**20** Acetaldehyde is produced from which of the following in the presence of aqueous  $KMnO_4$  solution?

- (a) Ethane (b) Ethyl alcohol  
(c) Methyl alcohol (d) Ethyl chloride

**21** Trichloroacetaldehyde was subjected to Cannizzaro reaction by using NaOH. The mixture of the products contains sodium trichloroacetate ion and another compound. The other compound is

- (a) 2,2,2-trichloroethanol  
(b) trichloromethanol  
(c) 2,2,2-trichloropropanol  
(d) chloroform

**22** The increasing order of the rate of HCN addition to compounds I-IV is

- I. HCHO II.  $CH_3COCH_3$   
III.  $PhCOCH_3$  IV.  $PhCOPh$   
(a)  $I < II < III < IV$  (b)  $IV < II < III < I$   
(c)  $IV < III < II < I$  (d)  $III < IV < II < I$

**23** Acetone is oxidised with

- (a) Tollen's reagent (b) acidic dichromate solution  
(c) Fehling's solution (d) Benedict's solution

**24** Wolff-Kishner reduction is used for the reduction of

- (a) nitro compounds (b) carboxylic acids  
(c) carbonyl compounds (d) olefins

**25** Ketones and  $1^\circ$  amines form

- (a) amides (b) oximes (c) urea (d) imine

**26** Which of the following alcohols cannot be produced by treatment of aldehydes or ketones with  $NaBH_4$  or  $LiAlH_4$ ?

- (a) 1-propanol (b) 2-propanol  
(c) 2-methyl-2-propanol (d) Ethanol

**27** Acetyl chloride cannot be obtained by treating acetic acid with

- (a)  $CHCl_3$  (b)  $PCl_3$  (c)  $PCl_5$  (d)  $SOCl_2$

**28** The acid showing salt like character in aqueous solution is

- (a) formic acid (b) acetic acid  
(c) benzoic acid (d)  $\alpha$ -amino acid

**29** Which one of the following is the strongest base in aqueous solution?

- (a) Trimethylamine (b) Aniline  
(c) Dimethylamine (d) Methyl

**30** On reaction with  $HNO_2$ ,  $C_2H_5NH_2$  produces

- (a)  $C_2H_5OH$  (b)  $C_2H_5NO_2$   
(c)  $CH_3CHO$  (d)  $CH_3COOH$

**31** Nitrobenzene on electrolytic reduction in strongly acidic medium gives

- (a) aniline (b) *p*-aminophenol  
(c) *m*-nitroaniline (d) nitroso benzene

**32** *o*-methoxy bromobenzene is treated with sodamide and then with ammonia. The product formed is

[NCERT Exemplar]

- (a) *o*-methoxy bromobenzene  
(b) methoxy benzene  
(c) *m*-methoxy aniline  
(d) aniline

**33** Aniline on heating with conc.  $HNO_3$  + conc.  $H_2SO_4$  mixture yields

- (a) *o* and *p*-nitroaniline (b) *m*-nitroaniline  
(c) a black tarry material (d) no reaction

**34** The decreasing order of reactivity of *m*-nitro bromobenzene (I); 2, 4, 6-trinitro bromobenzene (II); *p*-nitro bromobenzene (III); 2, 4-dinitro bromobenzene (IV) towards  $OH^-$  ions is

- (a)  $I > II > III > IV$  (b)  $II > IV > III > I$   
(c)  $IV > I > III > II$  (d)  $II > IV > I > III$

**35** Enzymes are made up of

- (a) carbohydrates  
(b) nitrogen containing carbohydrates  
(c) edible proteins  
(d) proteins with specific structure

**36**  $\alpha$ -helix is found in

- (a) DNA (b) RNA  
(c) carbohydrates (d) fats

**37** The number of amino acids found in proteins that a human body can synthesise is

- (a) 5 (b) 10 (c) 14 (d) 20

**38** The function of enzymes in living system is to

- (a) transport oxygen  
(b) provide energy  
(c) catalyse biochemical reactions  
(d) provide immunity

**39** The polymer containing strong intermolecular forces, e.g. hydrogen bonding, is

- (a) teflon (b) nylon-6, 6  
(c) polystyrene (d) natural rubber

**40** Which of the following is pheromone?

- (a) Linalool (b) Disparlure (c) BHA (d) Alitame

**Direction** (Q. Nos. 41-42) *In the following questions more than one of the answers given may be correct. Select the correct answers and mark it according to the codes.*

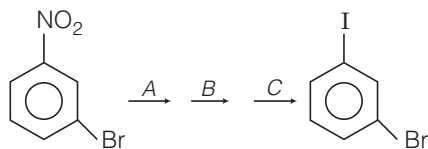
**Codes**

- (a) 1, 2 and 3 are correct (b) 1 and 2 are correct  
(c) 2 and 4 are correct (d) 1 and 3 are correct

**41** Which of the following compounds will react with acetone to give a product containing  $\text{C}=\text{N}$ —?

- (a)  $(\text{CH}_3)_3\text{N}$  (b)  $\text{C}_6\text{H}_5\text{NH}_2$   
(c)  $\text{C}_6\text{H}_5\text{NHC}_6\text{H}_5$  (d)  $\text{C}_6\text{H}_5\text{NHNH}_2$

**42** In the following reaction, reagents used are



1. KI 2. Sn/HCl 3.  $\text{NaNO}_2/\text{HCl}$  4.  $\text{H}_2$

**43** Match haloalkane/haloarenes (in Column I) with their application (in Column II) and choose the correct codes given below.

Column I	Column II
A. Iodoform	1. Termite pesticide
B. BHC	2. Inhalative anaesthetic
C. <i>p</i> -dichlorobenzene	3. Antiseptic
D. Halothanes	4. Moth repellent

**Codes**

- A B C D  
(a) 3 1 4 2  
(b) 1 3 2 4  
(c) 4 2 3 1  
(d) 2 4 1 3

**Direction** (Q. Nos. 44-45) *Each of these questions contains two statements : Assertion and Reason. Each of these questions also has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.*

- (a) Assertion is true, Reason is true; Reason is the correct explanation for Assertion  
(b) Assertion is true, Reason is true; Reason is not the correct explanation for Assertion  
(c) Assertion is true, Reason is false  
(d) Assertion is false, Reason is true

**44 Assertion** Tetracycline is a broad spectrum antibiotic.

**Reason** Tetracycline is effective against a number of types of bacteria, large viruses, etc.

**45 Assertion** Grignard reagent are alkyl or aryl magnesium halides.

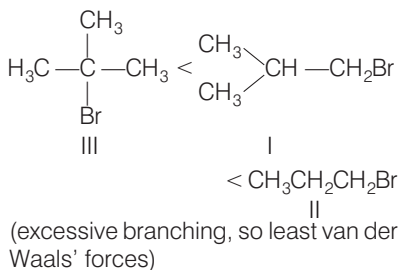
**Reason** Alcohols can be used as solvent for Grignard reagent.

## ANSWERS

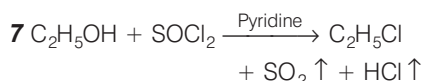
1 (c)	2 (a)	3 (c)	4 (a)	5 (a)	6 (b)	7 (a)	8 (d)	9 (a)	10 (d)
11 (d)	12 (c)	13 (a)	14 (c)	15 (a)	16 (d)	17 (a)	18 (c)	19 (b)	20 (b)
21 (a)	22 (c)	23 (b)	24 (c)	25 (d)	26 (c)	27 (a)	28 (d)	29 (c)	30 (a)
31 (b)	32 (c)	33 (c)	34 (b)	35 (d)	36 (a)	37 (b)	38 (c)	39 (b)	40 (b)
41 (b)	42 (a)	43 (a)	44 (a)	45 (c)					

# Hints and Explanations

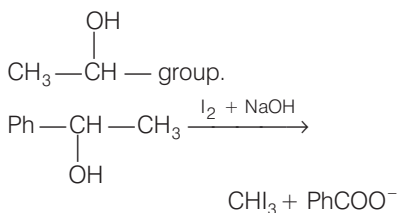
- 1** Increasing order of the boiling points of the given compounds are



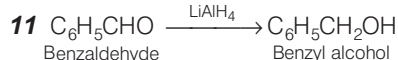
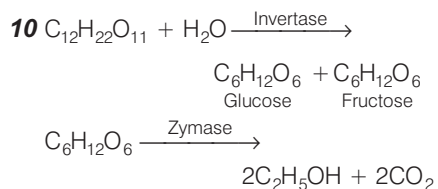
- 2**  $\text{CH}_3\text{I}$  is used as a methylating agent.  
**3** Lindane is an insecticide instead of antiseptic drug.  
**4** DDT is non-biodegradable pesticide.  
**5** Reaction of  $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$  with aqueous sodium hydroxide follows  $\text{S}_\text{N}1$  mechanism as  $\text{C}_6\text{H}_5\text{CH}_2^+$  is a more stable carbocation which is involved as an intermediate.  
**6** Chlorobenzene < vinyl chloride < chloroethane



- 8** For positive iodoform test, alcohol molecule should have

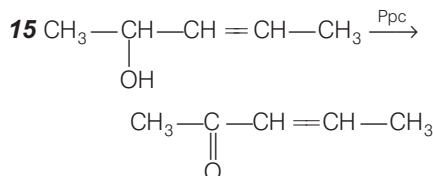
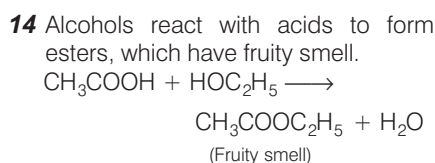


- 9** Solubility of alcohols in water decreases as the size of alkyl group increases because tendency to form H-bonding decreases so, the order of solubility is as  
 ethyl alcohol > *n*-propyl alcohol > *n*-butyl alcohol



- 12** Ethanol is a very weak acid therefore, it does not react with NaOH. However, it reacts with metallic sodium.

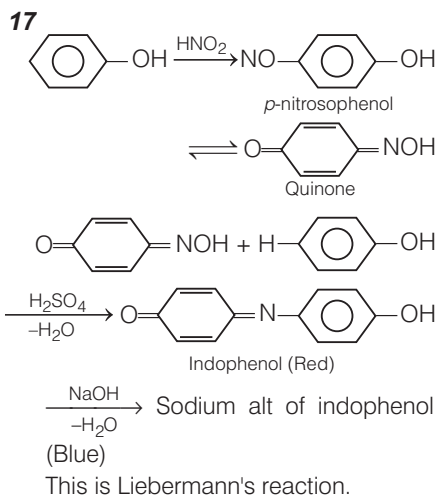
- 13** Protonation of  $-\text{OH}$  is the first step. It involves conversion of poor leaving group ( $-\text{OH}$ ) into good leaving group ( $-\text{OH}_2^+$ ).



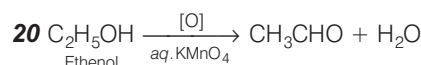
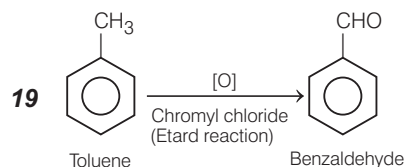
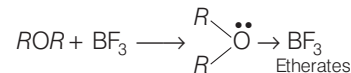
Pyridinium chloro chromate (PCC) oxidises an alcoholic group selectively in the presence of carbon-carbon double bond.

**16**

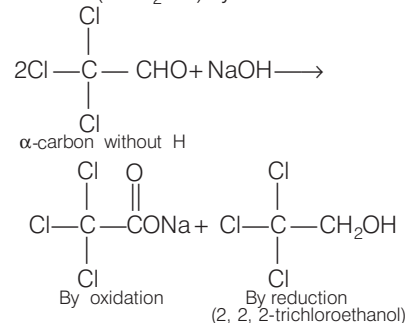
Reagent	Phenol	Benzoic acid	Conclusion
a. Aqueous NaOH		Salt formation	No specific colour change
b. Tollen's reagent	No effect	No effect	
c. Molisch reagent	No effect	No effect	
d. Neutral $\text{FeCl}_3$	Violet colour	Coloured precipitate	Thus, $\text{FeCl}_3$ can be used to make distinction



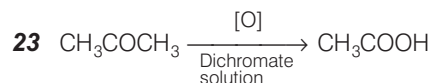
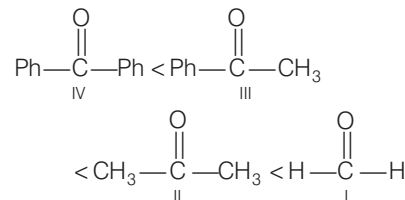
- 18** Etherates are the complexes of ethers with Lewis acid.



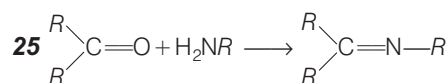
- 21** Cannizzaro reaction is given by aldehydes ( $\text{RCHO}$ ) lacking H at  $\alpha$ -carbon or lacking  $\alpha$ -carbon (as in  $\text{HCHO}$ ). With NaOH, there is formation of acid salt ( $\text{RCOO}^-$ ) by oxidation and alcohol ( $\text{RCH}_2\text{OH}$ ) by reduction.



- 22** Addition of HCN is a nucleophilic reaction. Greater the electron deficiency of carbonyl group, higher the rate of reaction. Hence,



- 24** In Wolff Kishner reduction, hydrazine in presence of KOH at 473 K reduces  $>\text{C}=\text{O}$  to  $>\text{CH}_2$ .



**26** 2-methyl-2-propanol cannot be prepared from aldehydes/ketones by reduction.

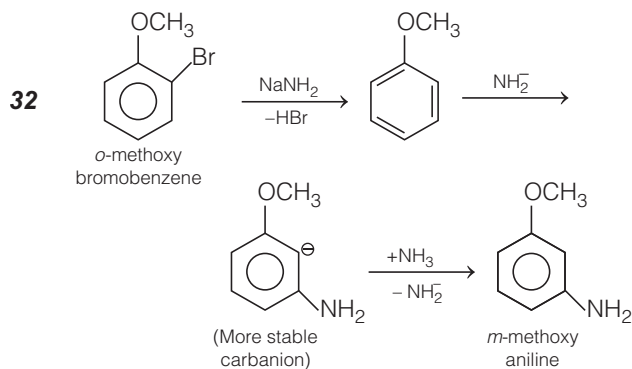
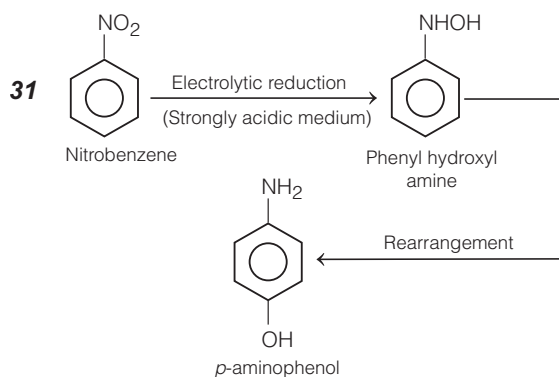
**27** Acetyl chloride cannot be obtained by treating acetic acid with chloroform ( $\text{CHCl}_3$ ).

**28**  $\alpha$ -amino acids exist as Zwitter ion (i.e. salt like character in aqueous solution).

**29** In aqueous solution, basicity order is

Dimethylamine > methylamine > trimethylamine > aniline

**30**  $\text{C}_2\text{H}_5\text{NH}_2 + \text{HONO} \longrightarrow \text{C}_2\text{H}_5\text{OH} + \text{N}_2 + \text{H}_2\text{O}$



**33** Aniline forms black tarry product along with some oxidation products.

**34** Reactivity decreases with the decrease in number of  $-\text{NO}_2$  groups. *m*-nitrobenzene is less reactive than *o*- and *p*-derivatives because  $-\text{NO}_2$  group at *m*-position cannot stabilise the carbocation.

**35** Enzymes are made up of proteins with specific structure.

**36**  $\alpha$ -helix structure is found in DNA.

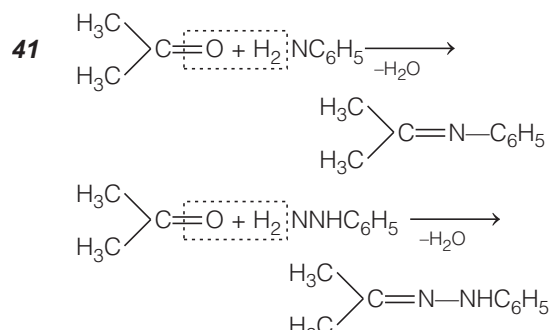
**37** Out of the 20 amino acids needed for a human body, only 10 can be synthesised in the body.

**38** Enzymes in living system is to catalyse biochemical reactions.

**39** Nylon-6, 6 contains strong intermolecular forces like

hydrogen bonds that are formed between  $-\text{C}(=\text{O})-\text{NH}$  group of successive chains.

**40** Disparlure is an example of pheromone (sex attractants).



**43**

S.No.	Haloalkane/Haloarene	Application
A.	Iodoform	Antiseptic
B.	BHC	Termite pesticide
C.	<i>p</i> -dichlorobenzene	Moth repellent
D.	Halothanes	Inhalative anaesthetic

**44** Broad spectrum antibiotics are effective against several different types of harmful microorganisms.

**45** Alcohols cannot be used as a solvent for Grignard reagent because alcohols react with Grignard reagent due to the presence of acidic hydrogen atom.

