

DAV CENTENARY PUBLIC SCHOOL, PASCHIM ENCLAVE, NEW DELHI-87

IUPAC AND COMMON NAME

Type-I : Groups of this type are treated as functional groups and represented by suffix in IUPAC nomenclature.

S.No.	Functional group	Name	Suffix	Prefix
1.	$\begin{array}{c} \text{O} \\ \\ -\text{C}-\text{OH} \end{array}$	Carboxylic acid	oic acid	Carboxy
2.	$-\text{SO}_3\text{H}$	Sulphonic acid	sulphonic acid	Sulpho
3.	$\begin{array}{c} -\text{C}-\text{O}-\text{C}- \\ \quad \quad \\ \text{O} \quad \quad \text{O} \end{array}$	Acid anhydride	oic anhydride	-
4.	$\begin{array}{c} -\text{C}-\text{OR} \\ \\ \text{O} \end{array}$	Ester	oate (alkyl+w.r.+oate)	Alkoxy carbonyl
5.	$\begin{array}{c} -\text{C}-\text{Cl} \\ \\ \text{O} \end{array}$	Acid chloride	oyl chloride	Chlorocarbonyl
6.	$\begin{array}{c} -\text{C}-\text{NH}_2 \\ \\ \text{O} \end{array}$	Amide	amide	Carbamoyl
7.	$-\text{C} \equiv \text{N}$	Cyanide	nitrile	Cyano
8.	$-\text{N} \equiv \text{C}$	Isocyanide	isonitrile	Isocyano
9.	$-\text{CHO}$	Aldehyde	al	oxo / formyl
10.	$\begin{array}{c} -\text{C}- \\ \\ \text{O} \end{array}$	Ketone	one	Oxo/Keto
11.	$-\text{OH}$	Alcohol	ol	Hydroxy
12.	$-\text{SH}$	Thio-alcohol	thiol	Mercapto
13.	$-\text{NH}_2$	Amine	amine	Amino
14.	$(=)$		ene	
15.	(\equiv)		yne	

Note : Double bond & triple bond are not true functional groups. w.r. → Word Root

Type II : Groups of this type are not considered as functional groups in IUPAC nomenclature. They are considered as substituents & therefore represented by prefix. type I functional group & their prefix are shown below:

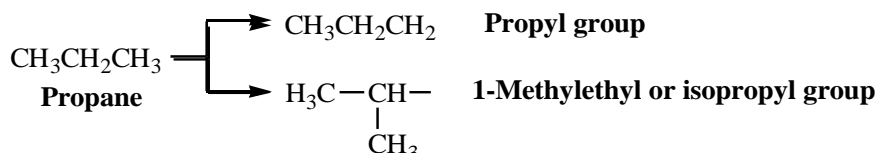
Groups	Prefix	Groups	Prefix
- F	fluoro	- NO ₂	nitro
- Cl	chloro	- NO	nitroso
- Br	bromo	- OR	alkoxy
- I	iodo	$\begin{array}{c} -C-C- \\ \diagdown \quad / \\ O \end{array}$	epoxy

If carbon group category functional group is present as principal functional group & its 'c' is not included in parent 'c' chain →

- COOH	Carboxylic acid	- COCl	Carbonyl chloride
$\begin{array}{c} -C-O-C- \\ \quad \\ O \quad O \end{array}$	Carboxylic anhydride	- CONH ₂	Carboxamide
-COOR	Carboxylate	- CN	Carbonitrile
		- CHO	Carbaldehyde

NOMENCLATURE OF BRANCHED ALKYL GROUPS .

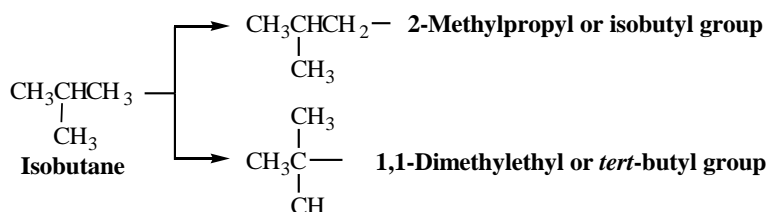
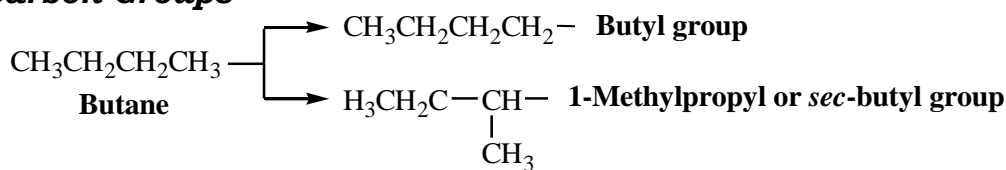
Three-Carbon Groups



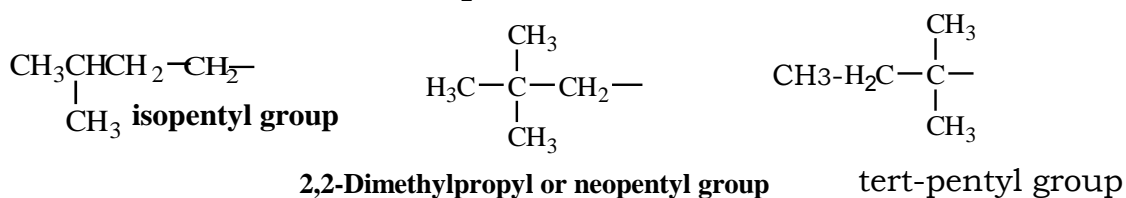
- 1) **1-Methylethyl** is the **systematic name**; **isopropyl** is a **common name**.
- 2) **Numbering always begins at the point where the group is attached to the main chain.**

The common names **isopropyl**, **isobutyl**, **sec-butyl**, **tert-butyl** are **approved by the IUPAC** for the unsubstituted groups.

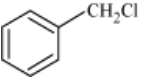

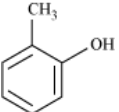
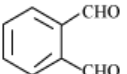
Four-Carbon Groups



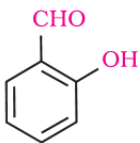
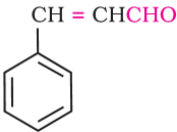
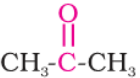
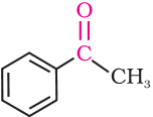
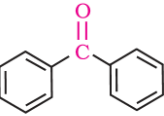
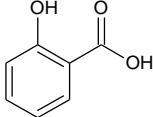
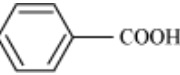
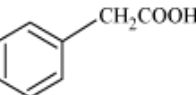
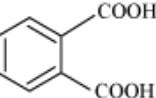
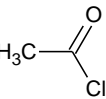
five-Carbon branch Groups



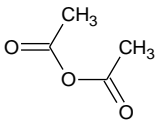
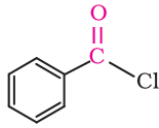
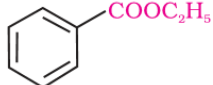
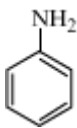
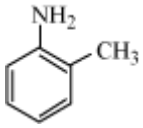
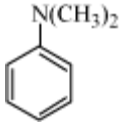
IUPAC AND COMMON NAME

Structure	Common Name	IUPAC Name
$\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Br}$	<i>n</i> -Butyl bromide	
$\begin{array}{c} \text{CH}_3 \\ \\ \text{CH}_3-\text{CH}-\text{CH}_2-\text{Cl} \end{array}$	Isobutyl chloride	
$\begin{array}{c} \text{Br} \\ \\ \text{CH}_3-\text{CH}_2-\text{CH}-\text{CH}_3 \end{array}$	<i>sec</i> -butyl bromide	
$\text{CH}_3\text{CH}_2\text{CH}(\text{Cl})\text{CH}_3$	<i>sec</i> -Butyl chloride	
$(\text{CH}_3)_3\text{CCH}_2\text{Br}$	<i>neo</i> -Pentyl bromide	
$(\text{CH}_3)_3\text{CBr}$	<i>tert</i> -Butyl bromide	
CH_2Cl_2	Methylene chloride	
	Benzyl chloride	
	Hydroquinone or Quinol	
	<i>o</i> -Cresol	
$\text{C}_6\text{H}_5\text{OCH}_2\text{CH}_3$	Ethylphenyl ether	
$\text{C}_6\text{H}_5\text{OCH}_3$	Methylphenyl ether (Anisole)	
$\text{C}_6\text{H}_5\text{O}(\text{CH}_2)_6-\text{CH}_3$	Heptylphenyl ether	
HCHO	Formaldehyde	
CH_3CHO	Acetaldehyde	
$(\text{CH}_3)_2\text{CHCHO}$	Isobutyraldehyde	
$\text{CH}_2=\text{CHCHO}$	Acrolein	
	Phthalaldehyde	

IUPAC AND COMMON NAME

	Salicylaldehyde	
	Cinnamaldehyde	
	Acetone	
	Acetophenone	
 <p>Benzophenone</p>	benzophenone	
	Salicylic acid	
HCOOH	Formic acid	
CH ₃ COOH	Acetic acid	
HOOC-COOH	Oxalic acid	
HOOC-CH ₂ -COOH	Malonic acid	
	Benzoic acid	
	Phenylacetic acid	
	Phthalic acid	
	Acetyl chloride	

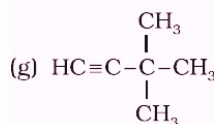
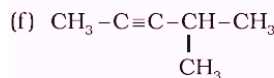
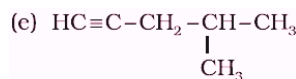
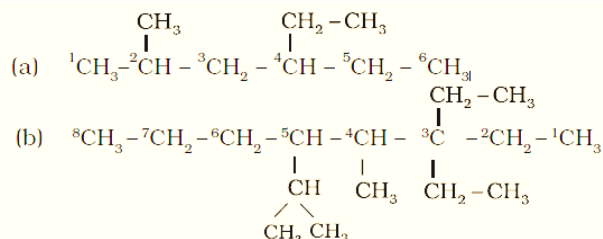
IUPAC AND COMMON NAME

	Acetic anhydride	
	Benzoyl chloride	
$(C_6H_5CO)_2O$	Benzoic anhydride	
	Ethyl benzoate	
$CH_3-CH_2-NH_2$	Ethylamine	
$\begin{array}{c} CH_3-CH-CH_3 \\ \\ NH_2 \end{array}$	Isopropylamine	
$\begin{array}{c} CH_3-N-CH_2-CH_3 \\ \\ H \end{array}$	Ethylmethylamine	
$\begin{array}{c} CH_3-N-CH_3 \\ \\ CH_3 \end{array}$	Trimethylamine	
	Aniline	
	<i>o</i>-Toluidine	
	N,N-Dimethylaniline	

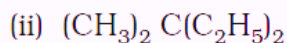
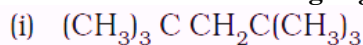
IUPAC AND COMMON NAME

NOMENCLATURE OF HYDRCARBONS

Q 1 Write the IUPAC name of the following organic compounds

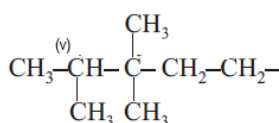
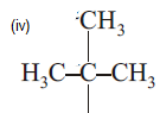
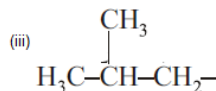
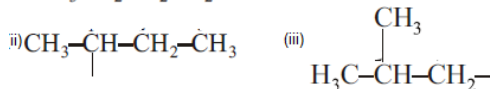
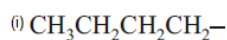


Q2 Write the IUPAC name of the following organic compounds

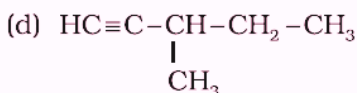
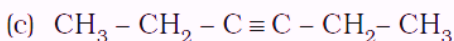
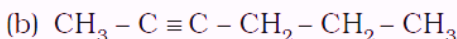
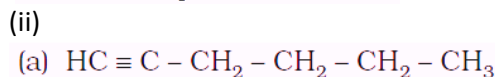
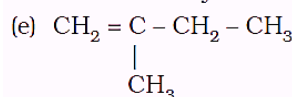
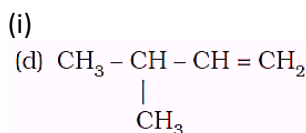


(iii) tetra - *tert*-butylmethane

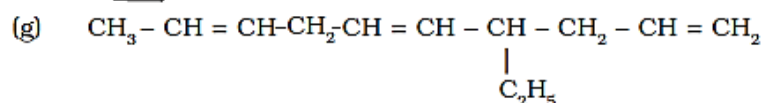
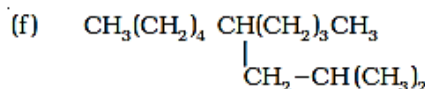
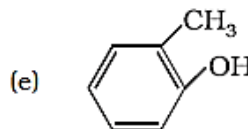
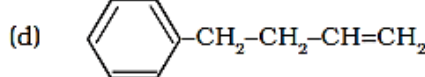
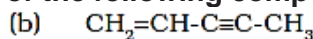
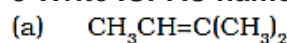
Q3 Write structures and IUPAC names of Alkyl groups



4 Write IUPAC names of following
Write IUPAC names of following



5 Write IUPAC names of the following compounds :



A1

[4 - Ethyl - 2 - methylhexane

3,3-Diethyl-5-isopropyl-4-methyloctane

A2 (i) 2, 2, 4, 4-Tetramethylpentane

(ii) 3, 3-Dimethylpentane

(iii) 3,3-Di-*tert*-butyl -2, 2, 4, 4 -tetramethylpentane

A3

(i) Butyl (ii) 1-methyl propyl (iii) 2-methyl propyl

(iv) 1,1-dimethylpropyl (v) 3,3,4-trimethyl-pentyl

A4

(i)(d) 3-Methylbut-1-ene, (e) 2-Methylbut-1-ene

(ii) Hex-1-yne, Hex-2-yne, Hex-3-yne, 3-Methylpent-1-yne, 4-Methylpent-1-yne, 4-Methylpent-2-yne, 3,3-Dimethylbut-1-yne

A5

2-Methylbut-2-ene

Pent-1-ene-3-yne

1, 3-Butadiene or Buta-1,3-diene

4-Phenyl but-1-ene

2-Methyl phenol

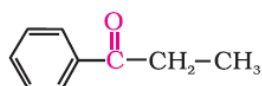
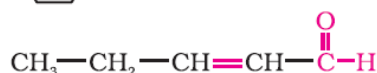
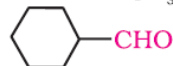
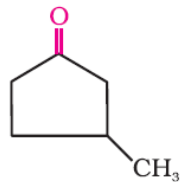
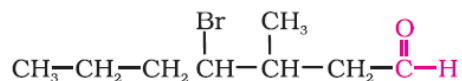
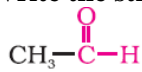
5-(2-Methylpropyl)-decane

4-Ethyldeca-1, 5, 8-triene

IUPAC AND COMMON NAME

NOMENCLATURE OF FUNCTIONAL GROUP

Q 1 Write the structures and IUPAC name

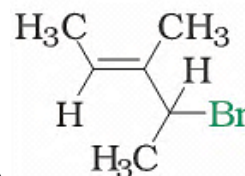
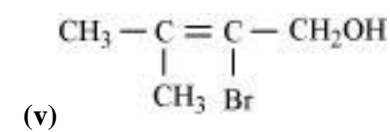
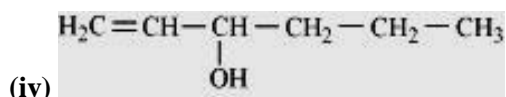
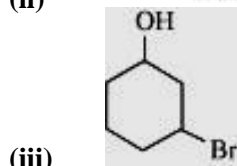
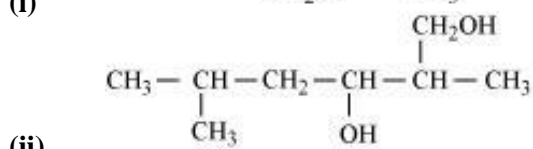
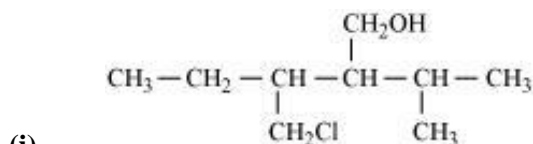


Q 2 Write the structures and IUPAC name

(i) isobutyl bromide

(ii) tertiarybutyl bromide

Q3 Name the following compounds according to IUPAC system.



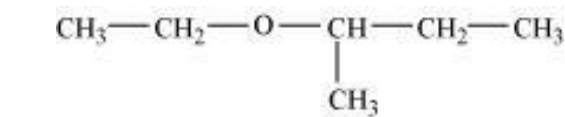
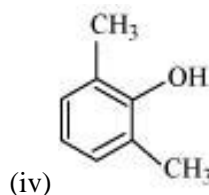
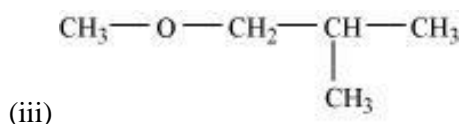
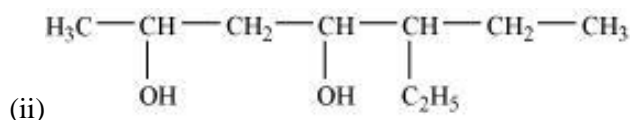
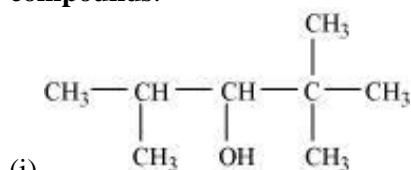
(vi)

Q4 Write the structures of the following organic halogen compounds

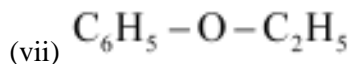
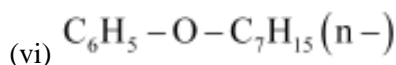
(i) 2-(2-Chlorophenyl)-1-iodooctane

(ii) 1-Bromo-4-sec-butyl-2-methylbenzene

Q 5 Write IUPAC names of the following compounds:



(v)



Q6 Write the structures of the following compounds.

(i) 3-Hydroxybutanal

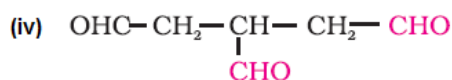
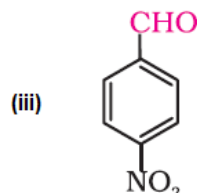
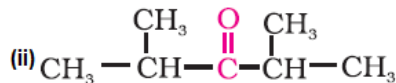
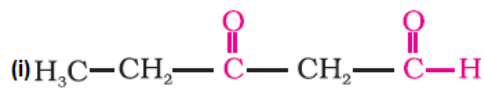
(ii) 2-Hydroxycyclopentane carbaldehyde

(iv) 4-Oxopentanal

(iv) 4-Fluoroacetophenone

Q7 write IUPAC names of following

IUPAC AND COMMON NAME



- (iv) $(\text{CH}_3)_3\text{CNH}_2$
 (v) $\text{C}_6\text{H}_5\text{NHCH}_3$
 (vi) $(\text{CH}_3\text{CH}_2)_2\text{NCH}_3$
 (vii) $m\text{-BrC}_6\text{H}_4\text{NH}_2$

12 names of monohydric phenols of molecular formula, $\text{C}_7\text{H}_8\text{O}$.

13 Name the following according to IUPAC system.

- (i) $(\text{CH}_3)_3\text{CCH}_2\text{CH}(\text{Br})\text{C}_6\text{H}_5$
 (ii) $\text{CH}_3\text{C}(\text{C}_2\text{H}_5)_2\text{CH}_2\text{Br}$
 (iii) $\text{CH}_3\text{CH}=\text{CHC}(\text{Br})(\text{CH}_3)_2$
 (iv) $o\text{-Br-C}_6\text{H}_4\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_3$
 (v) $m\text{-ClCH}_2\text{C}_6\text{H}_4\text{CH}_2\text{C}(\text{CH}_3)_3$
 (vi) $\text{CH}_3\text{C}(p\text{-ClC}_6\text{H}_4)_2\text{CH}(\text{Br})\text{CH}_3$
 (vii) $(\text{CH}_3)_3\text{CCH}=\text{CClC}_6\text{H}_4\text{I-}p$

Q8 Name the following compounds according to IUPAC system of nomenclature:

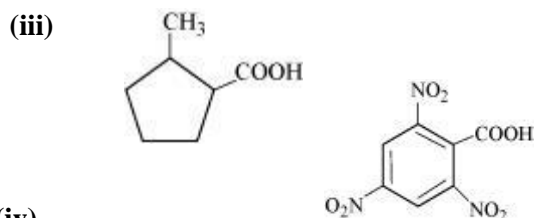
- (i) $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_2\text{CHO}$
 (ii) $\text{CH}_3\text{CH}_2\text{COCH}(\text{C}_2\text{H}_5)\text{CH}_2\text{CH}_2\text{Cl}$
 (iii) $\text{CH}_3\text{CH}=\text{CHCHO}$
 (iv) $\text{CH}_3\text{COCH}_2\text{COCH}_3$
 (v) $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_2\text{C}(\text{CH}_3)_2\text{COCH}_3$
 (vi) $(\text{CH}_3)_3\text{CCH}_2\text{COOH}$ (vii)
 (vii) $\text{OHCC}_6\text{H}_4\text{CHO-}p$

Q9 Draw the structures of the following compounds.

- (i) 3-Methylbutanal
 (ii) *p*-Nitropropiophenone
 (iii) *p*-Methylbenzaldehyde
 (iv) 4-Methylpent-3-en-2-one
 (v) 4-Chloropentan-2-one
 (vi) 3-Bromo-4-phenylpentanoic acid
 (vii) *p,p'*-Dihydroxybenzophenone
 (viii) Hex-2-en-4-ynoic acid

Q10 Give the IUPAC names of the following compounds:

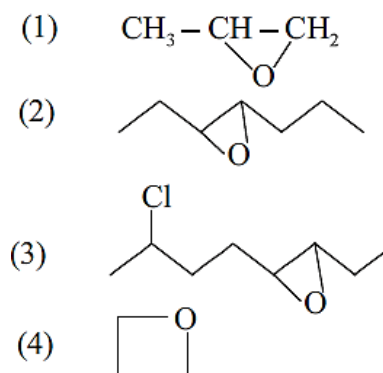
- (i) $\text{PhCH}_2\text{CH}_2\text{COOH}$
 (ii) $(\text{CH}_3)_2\text{C}=\text{CHCOOH}$



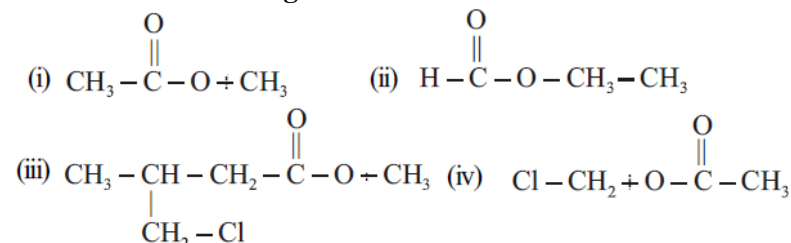
Q11 Write IUPAC names of the following compounds and classify them into primary, secondary and tertiary amines.

- (i) $(\text{CH}_3)_2\text{CHNH}_2$
 (ii) $\text{CH}_3(\text{CH}_2)_2\text{NH}_2$
 (iii) $\text{CH}_3\text{NHCH}(\text{CH}_3)_2$

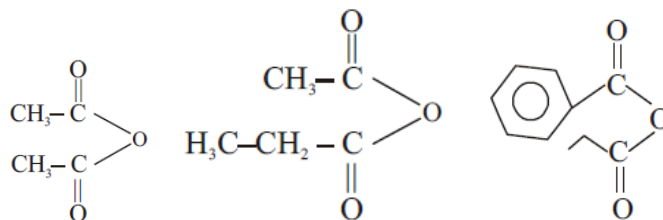
14 Name the following



15 Name the following



16 Name the following



IUPAC AND COMMON NAME

(iv) 2, 6-Dimethylphenol

(v) 2-Ethoxybutane

(vi) 1-Phenoxyheptane

(vii) Ethoxybenzene

Key Functional group

(1)

Ethanal

4-Bromo-3-methylheptanal

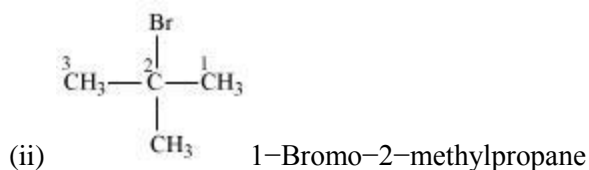
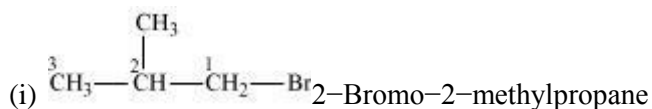
3-Methylcyclopentanone

Cyclohexanecarbaldehyde

Pent-2-enal

1-Phenylpropan-1-one

2 A



3 A

(i) 3-Chloromethyl-2-isopropylpentan-1-ol

(ii) 2, 5 Dimethylhexane-1, 3-diol

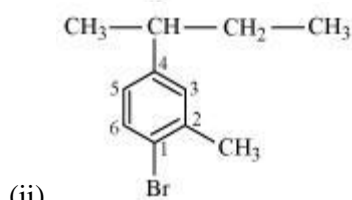
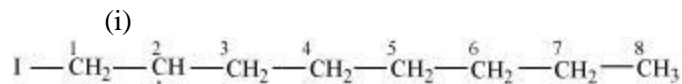
(iii) 3-Bromocyclohexanol

(iv) Hex-1-en-3-ol

(v) 2-Bromo-3-methylbut-2-en-1-ol

(vi) 4-Bromo-3-methylpent-2-ene

4 A



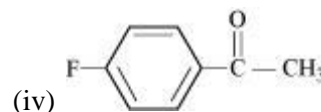
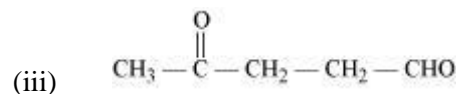
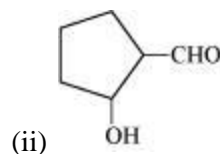
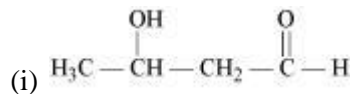
5A

(i) 2, 2, 4-Trimethylpentan-3-ol

(ii) 5-Ethylheptane-2, 4-diol

(iii) 1-Methoxy-2-methylpropane

6A



A7

3-Oxopentanal

2,4-Dimethylpentan-3-one

Propane-1,2,3-tricarbaldehyde

4-Nitrobenzenecarbaldehyde

or

4-Nitrobenzaldehyde

A8

(i) 4-methylpentanal

(ii) 6-Chloro-4-ethylhexan-3-one

(iii) But-2-en-1-al

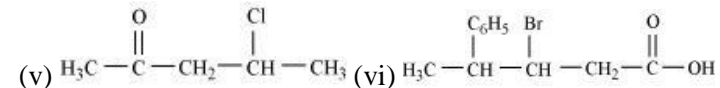
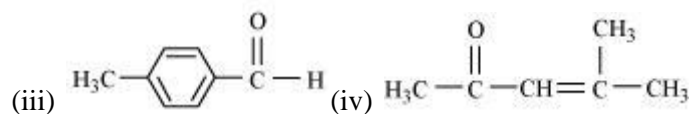
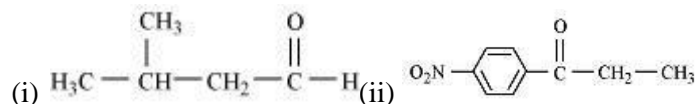
(iv) Pentane-2,4-dione

(v) 3,3,5-Trimethylhexan-2-one

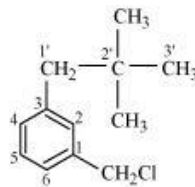
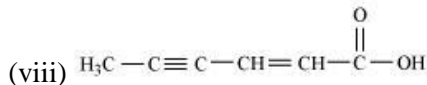
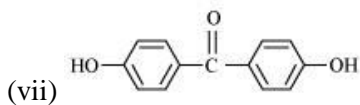
(vi) 3,3-Dimethylbutanoic acid

(vii) Benzene-1,4-dicarbaldehyde

A9



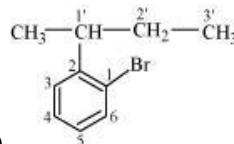
IUPAC AND COMMON NAME



(iv) 1-Chloromethyl-3-(2,2-dimethylpropyl) benzene

A 10

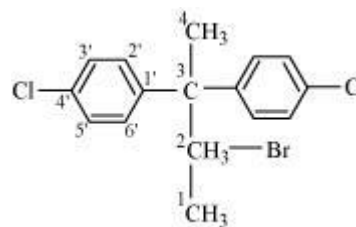
- (i) 3-Phenylpropanoic acid
 (ii) 3-Methylbut-2-enoic acid
 (iii) 2-Methylcyclopentanecarboxylic acid
 (iv) 2,4,6-Trinitrobenzoic acid



(v) 1-Bromo-2-(1-methylpropyl) benzene

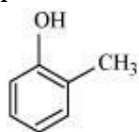
A11

- (i) propane 2-amine (1° amine) (ii) Propan-1-amine (1° amine)
 (iii) N-Methyl-propan-2-amine (2° amine)
 (iv) 2-Methylpropan-2-amine (1° amine) (v) N-Methylbenzamine or N-methylaniline (2° amine)
 (vi) N-Ethyl-N-methylethanamine (3° amine)
 (vii) 3-Bromobenzenamine or 3-bromoaniline (1° amine)

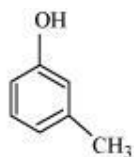


(vi) 2-Bromo-3,3-bis(4-chlorophenyl) butane

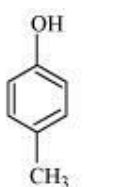
12A



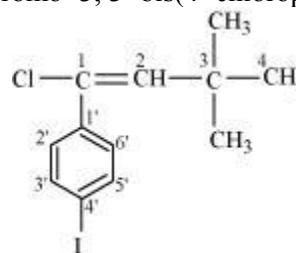
2 - Methylphenol
(*o* - Cresol)



3 - Methylphenol
(*m* - Cresol)

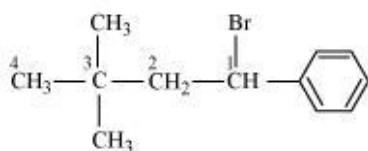


4 - Methylphenol
(*p* - Cresol)

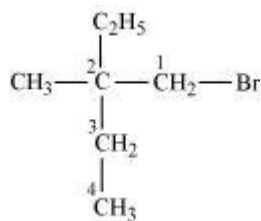


(vii) 1-chloro-1-(4-iodophenyl)-3,3-dimethylbut-1-ene

13A



(i) 1-Bromo-3,3-dimethyl-1-phenylbutane



(ii) 1-Bromo-2-ethyl-2-methylbutane

(iii) 4-Bromo-4-methylpent-2-ene

14A

- 1, 2-epoxy propane
 3, 4-epoxy heptane
 2-chloro-5, 6-epoxy octane
 1, 3-epoxy propane

15

- Methyl ethanoate
 ethyl methanoate
 methyl-4-chloro-3-methyl butanoate
 chloromethylethanoate