



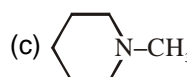
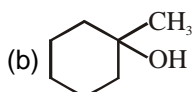
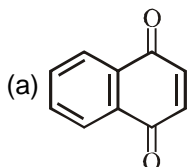
Exercise-1

Marked questions are recommended for Revision.

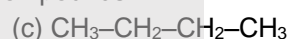
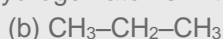
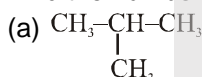
PART - I : SUBJECTIVE QUESTIONS

Section (A) : Fundamental of Organic Chemistry

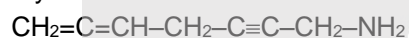
A-1. Write the number of σ and π bonds in the following molecules ?



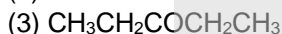
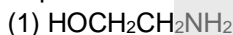
A-2. Find the number of 1° , 2° & 3° hydrogen atoms in the following compounds



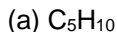
A-3. Find the hybridization state of each carbon atoms in following compound ?



A-4. Expand each the following condensed formulae into their complete structural and bond line formulae :



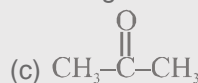
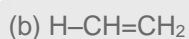
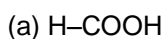
A-5. Find DU of following compound :



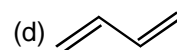
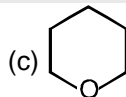
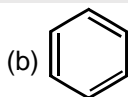
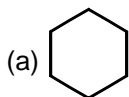
A-6. Find DU of following compound :



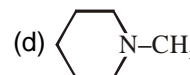
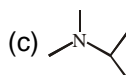
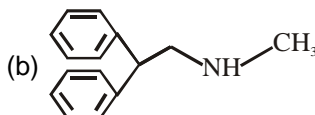
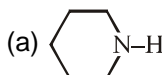
A-7. Draw formulae for the first four members of each homologous series beginning with the following.



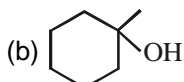
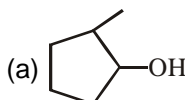
A-8. Classify the following compounds as homocyclic, heterocyclic, alicyclic, aromatic, saturated and unsaturated.



A-9. Indicate the following as 1° , 2° and 3° amines.



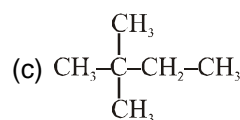
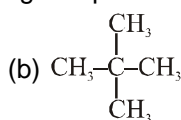
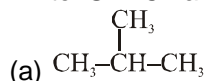
A-10. Indicate the following as 1° , 2° and 3° alcohol.



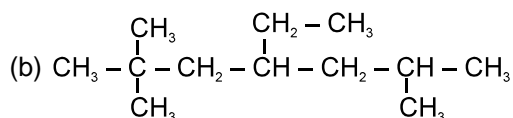
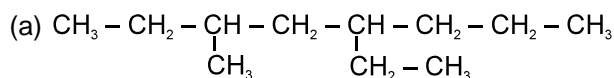


Section (B) : IUPAC-Nomenclature of Alkane & Cycloalkane

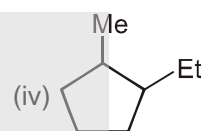
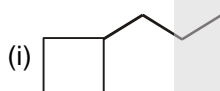
B-1. Write IUPAC name of the following compounds :



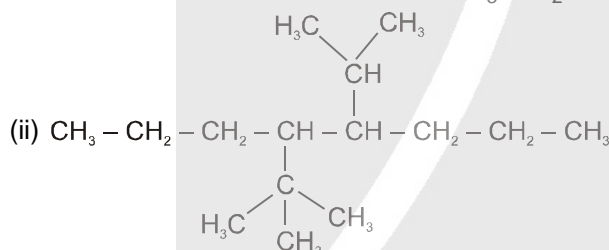
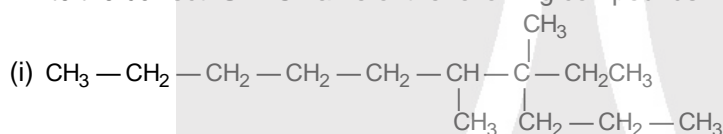
B-2. Write IUPAC name of the following compounds:-



B-3. Write correct IUPAC name of the following



B-4. Write the correct IUPAC name of the following compounds.



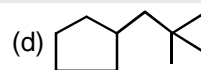
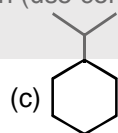
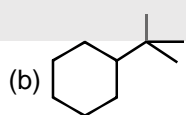
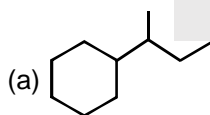
B-5. Write structures of the following IUPAC name.

(i) 1, 3-Dicyclopentyl propane

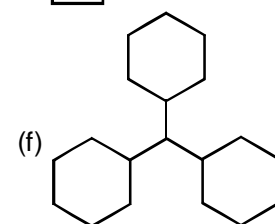
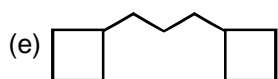
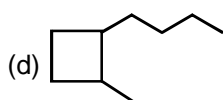
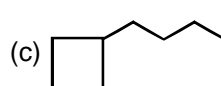
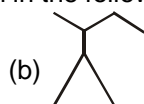
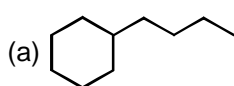
(ii) 1-Methyl-4-propylcyclohexane

(iii) 2-Ethyl-1,1-dimethylcyclopentane

B-6. Write IUPAC names of the following hydrocarbon (use common naming for hydrocarbon groups.)

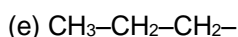
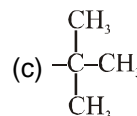
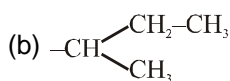
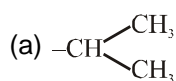


B-7. Identify the parent chain in the following compounds as ring or side chain.





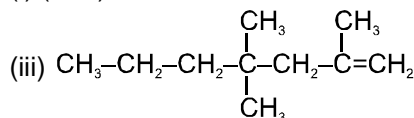
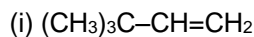
B-8. Write the common name of the following alkyl groups.



Section (C) : IUPAC-Nomenclature of Alkene, Cycloalkene, Polyenes & Alkyne

C-1. Write the general formula of alkenes. Give IUPAC names of first three members.

C-2. Write IUPAC name of the following :

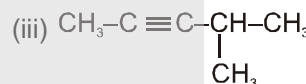
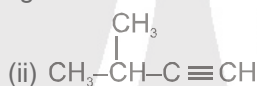
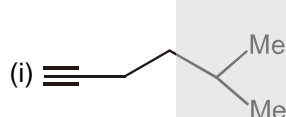


C-3. Draw the bond line structures of the following compounds.

(a) 2-Methylhept-3-ene

(b) 2,6-Dimethylhepta-1, 5-diene

C-4. Write IUPAC name of the following



C-5. Draw structure of following IUPAC names.

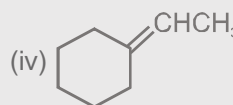
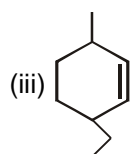
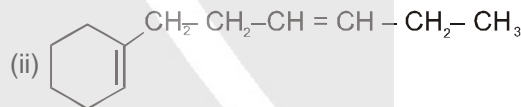
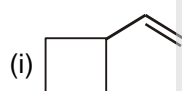
(i) Hexa-2,4-diyne

(ii) Pent-3-en-1-yne

(iii) Pent-1-en-4-yne

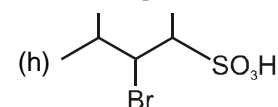
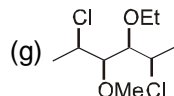
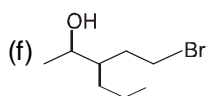
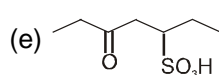
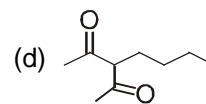
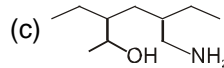
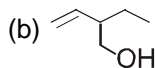
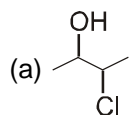
(iv) Pent-1-en-3-yne

C-6. Write the IUPAC name of the following



Section (D) : IUPAC Nomenclature of non-chain terminating functional groups

D-1. Write the IUPAC names of the following compounds.



D-2. Draw the structures of each of the followings.

(a) Butan-1-ol

(b) Butane-2-thiol

(c) Pentan-2-amine

(d) Pentan-2-one

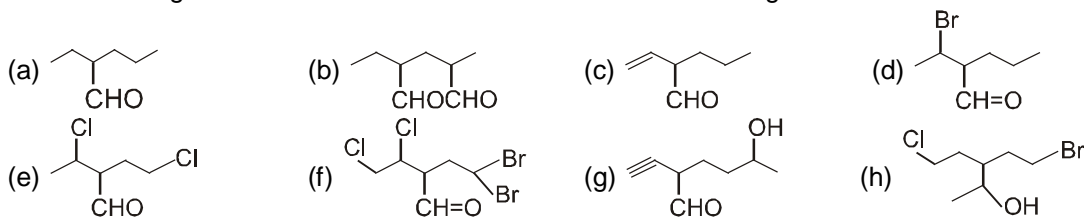
(e) 3-Chloropentan-1-ol

(f) Hexan-2,4-dione



Section (E) : IUPAC Nomenclature of chain terminating functional groups

E-1. Select the longest continuous carbon chain in each of the following molecules.



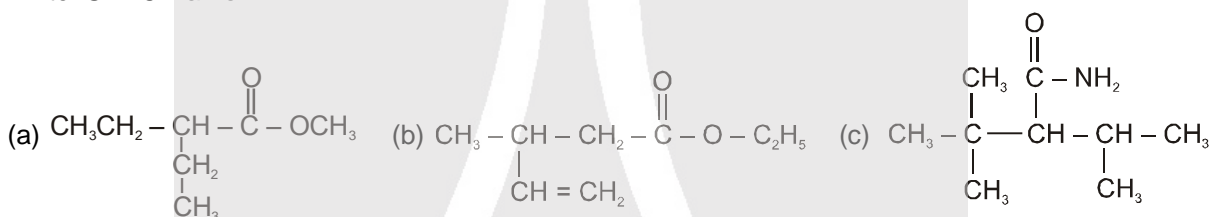
E-2. Write the structure of the following compounds :

- (a) 3-Hydroxypentane-2-sulphonic acid. (b) 3-Chloromethylpentanoic acid
 (c) 3-Bromobutanoyl chloride (d) Cyclohexyl ethanoate
 (e) Phenyl ethanoate (f) 2-Chloroethyl propanoate
 (g) Diethyl pentanedioate

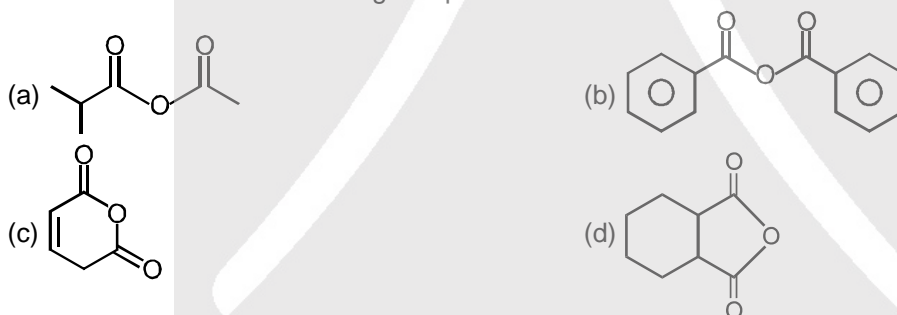
E-3. Write the structure of the following compounds :

- (a) Butanamide (b) N-methylethanamide
 (c) Cyclopropanecarboxylic anhydride (d) Cyclopropylbutanoate

E-4. Write IUPAC Name :



E-5. Write IUPAC names of following compounds.

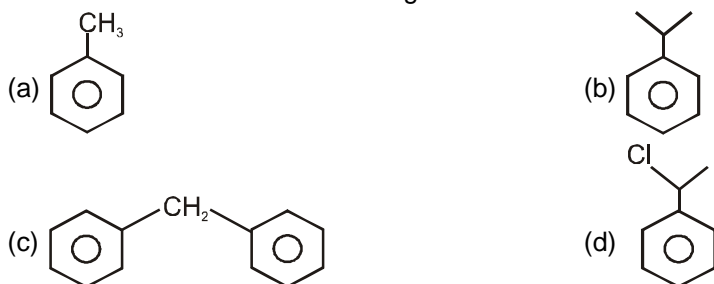


E-6. Write IUPAC names of following compounds.



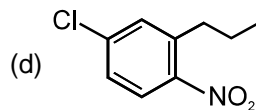
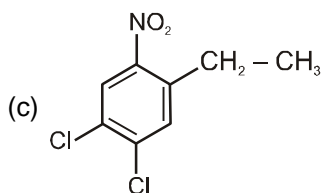
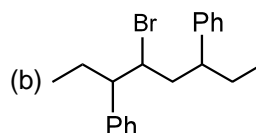
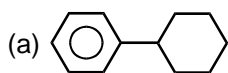
Section (F) : IUPAC-Nomenclature of Aromatic compounds

F-1. Write IUPAC name of the following :

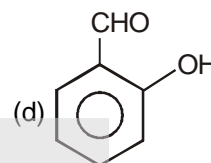
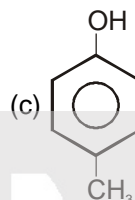
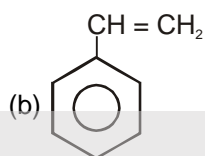
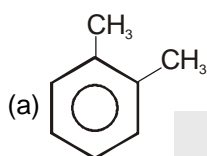




F-2. Write the correct IUPAC name of the following :

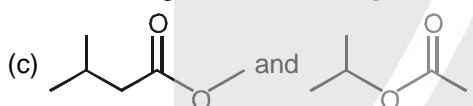
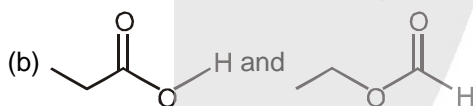
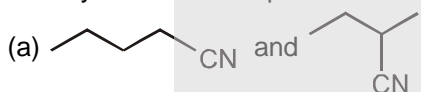


F-3. Write common & IUPAC name of following structure:

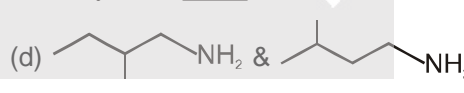
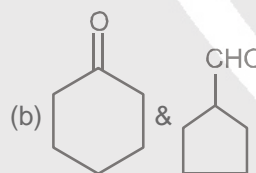
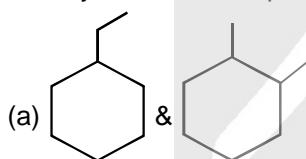


Section (G) : Structural Isomerism

G-1. Identify the relationship between the given compounds.



G-2. Identify the relationship between the given compounds.



Section (H) : Number of Structural Isomers

H-1. Draw all structurally isomeric alkenes with molecular formula C_4H_8 .

H-2. Draw all structurally isomeric 2° chlorides with molecular formula $C_5H_{11}Cl$.

H-3. Draw all structurally isomeric benzene containing isomers with molecular formula C_7H_8O .

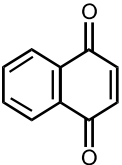
H-4. Draw all structurally isomeric cyclic bromides with molecular formula C_4H_7Br .

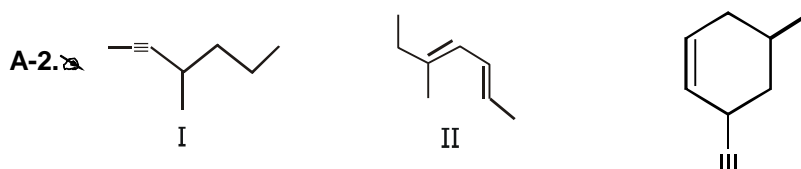
H-5. The ring chain functional isomer of compound But-2-ene are.



PART - II : ONLY ONE OPTION CORRECT TYPE

Section (A) : Fundamental of Organic Chemistry

- A-1. Molecular formula of naphthaquinone  is
- (A) $C_{12}H_8O_2$ (B) $C_{11}H_6O_2$ (C) $C_{10}H_6O_2$ (D) $C_{10}H_8O_2$



Incorrect statement for the above structure :

- (A) I, II & III have C_nH_{2n-2} general formula. (B) I, II & III have same empirical formula.
 (C) I, II are identical and homologue of compound III. (D) I, II & III have same molecular formula.

- A-3. Which of the following is not an alicyclic compound ?



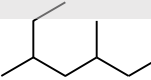
- A-4. The saturated heterocyclic compound is :



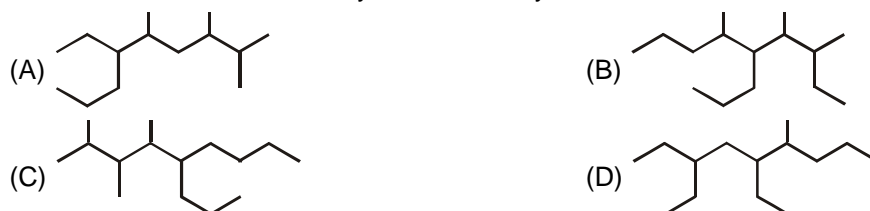
- A-5. Which of the following compound is unsaturated hydrocarbon ?



Section (B) : IUPAC-Nomenclature of Alkane & Cyclo alkane

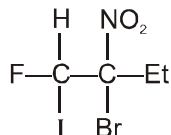
- B-1. The correct IUPAC name of the alkane  is :
- (A) 2-Ethyl-4-methylhexane (B) 5-Ethyl-3-methylhexane
 (C) 3,5-Dimethylheptane (D) 3,5-Dimethylhexane

- B-2. The correct structure of 6-Ethyl-2,3,5-trimethylnonane is :





B-3. The correct IUPAC name of the following compound is :

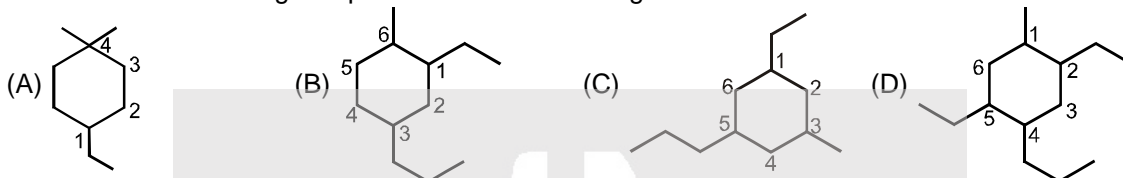


- (A) 1-Bromo-1-ethyl-2-fluoro-2-iodo-1-nitroethane.
 (B) 3-Bromo-4-fluoro-4-iodo-3-nitrobutane.
 (C) 2-Bromo-1-fluoro-1-iodo-2-nitrobutane.
 (D) 1-Fluoro-1-iodo-2-bromo-2-ethyl-2-nitroethane.

B-4. A student named a certain compound as 2, 3-diethylbutane. Its correct IUPAC names is

- (A) 2, 3-Dimethylhexane
 (B) 3, 4-Dimethylhexane
 (C) 2-Ethyl-3-methylpentane
 (D) 2-Ethylbutane

B-5. In which of the following compound IUPAC numbering is correct ?



Section (C) : IUPAC-Nomenclature of Alkene, Alkyne, Cyclo alkene & polyenes

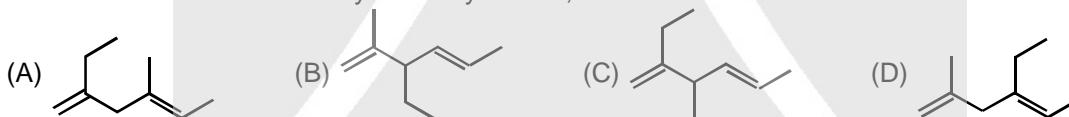
C-1. Select the structure with correct numbering in the chain :

- (A) $\overset{5}{\text{CH}_2} = \overset{4}{\text{CH}} - \overset{3}{\text{CH}_2} - \overset{2}{\text{C}} \equiv \overset{1}{\text{CH}}$
 (B) $\overset{1}{\text{CH}_3} - \overset{2}{\text{CH}} = \overset{3}{\text{CH}} - \overset{4}{\text{CH}_2} - \overset{5}{\text{C}} \equiv \overset{6}{\text{CH}}$
 (C) $\overset{7}{\text{CH}_2} = \overset{6}{\text{CH}} - \overset{5}{\text{CH}} = \overset{4}{\text{CH}} - \overset{3}{\text{CH}_2} - \overset{2}{\text{CH}} = \overset{1}{\text{CH}_2}$
 (D) $\overset{1}{\text{CH}_2} = \overset{2}{\text{CH}} - \overset{3}{\text{CH}} = \overset{4}{\text{CH}} - \overset{5}{\text{CH}_2} - \overset{6}{\text{C}} \equiv \overset{7}{\text{CH}}$

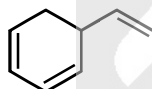
C-2. The correct IUPAC name of the compound $\text{CH}_2 = \text{CH} - \text{CH}_2 - \overset{\text{C}_2\text{H}_5}{\text{CH}} - \text{CH}_3$

- (A) 4-Ethylpent-1-ene (B) 2-Ethylpent-4-ene (C) 4-Methylhex-1-ene (D) 3-Methylhex-1-ene

C-3. The correct structure of 2-Ethyl-3-methylhexa-1,4-diene :



C-4. The correct IUPAC name of the compound



- (A) 1-Ethenylcyclohexa-2, 4-diene
 (B) 5-Ethenylcyclohexa-1, 3-diene
 (C) 6-Ethenylcyclohexa-1, 3-diene
 (D) Cyclohexa-2, 4-dienylethene

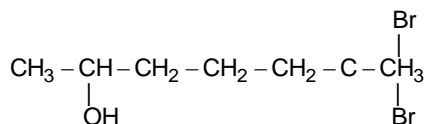
Section (D) : IUPAC Nomenclature of non-chain terminating functional groups

D-1. Which of the following is a correct priority order of functional groups?

- (A) $-\text{COOH} \rangle -\text{SO}_3\text{H} \rangle -\text{NH}_2 \rangle -\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_2$
- (B) $-\overset{\text{O}}{\parallel}{\text{C}}-\text{H} \rangle -\overset{\text{O}}{\parallel}{\text{C}}-\text{R} \rangle -\text{OH} \rangle -\text{NH}_2$
- (C) $-\text{SO}_3\text{H} \rangle -\overset{\text{O}}{\parallel}{\text{C}}-\text{R} \rangle -\text{CHO} \rangle -\text{OH}$
- (D) $-\overset{\text{O}}{\parallel}{\text{C}}-\text{OR} \rangle -\overset{\text{O}}{\parallel}{\text{C}}-\text{X} \rangle -\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}- \rangle -\text{CHO}$

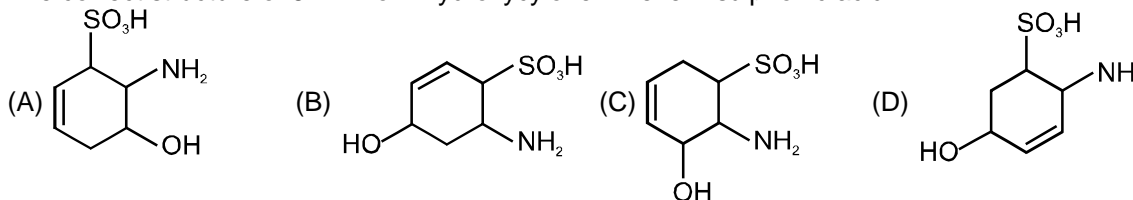


D-2. The IUPAC name of is :



- (A) 6, 6-Dibromoheptan-2-ol (B) 2, 2-Dibromoheptan-6-ol
(C) 6, 6-Dibromoheptan-2-al (D) None of these

D-3. The correct structure of 6-Amino-4-hydroxycyclohex-2-ene-1-sulphonic acid.



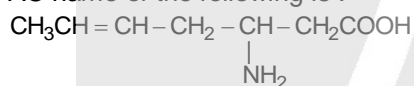
D-4. The correct IUPAC name of the given compound is



- (A) 3-Chloro-1-fluoro-1-iodo-4-methoxybut-1-en-3-yne
(B) 4-Methoxy-2-chloro-1-fluoro-1-iodobutenyne
(C) 3-Chloro-4-fluoro-4-iodo-1-methoxybutenyne
(D) 2-Chloro-1-fluoro-1-iodo-4-methoxybutenyne

Section (E) : IUPAC-Nomenclature of chain terminating Functional groups

E-1. The IUPAC name of the following is :

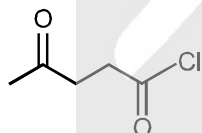


- (A) 3-Aminohept-5-enoic acid (B) 5-Aminohex-2-enecarboxylic acid
(C) 3-Aminohept-4-enoic acid (D) 5-Aminohept-2-enoic acid

E-2. is named as :

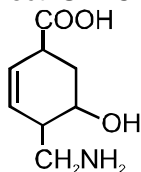
- (A) 2, 3-Dimethylenebutanal (B) 3-Methyl-2-methylenebut-3-enone
(C) 3-Methyl-2-methylenebut-3-enal (D) 2, 3-Dimethylenebutanone

E-3. The correct IUPAC name of compound is :



- (A) 1-Chloropentane-1, 4-dione (B) 4-Chlorocarbonylbutan-2-one
(C) 4-Oxopentanoyl chloride (D) 3-Oxobutanecarbonyl chloride

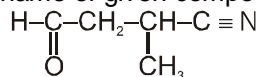
E-4. The correct IUPAC name of following compound is



- (A) 4-Aminomethyl-3-hydroxycyclohex-5-ene-1-carboxylic acid
(B) 2-Aminomethyl-5-carboxycyclohex-3-en-1-ol
(C) 4-Aminomethyl-5-hydroxycyclohex-2-ene-1-carboxylic acid
(D) 3-Hydroxy-4-aminomethylcyclohex-5-en-1-oic acid



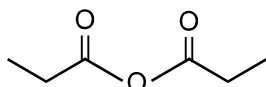
E-5. IUPAC name of given compound is :



- (A) 3- Cyanitrile-3-methyl butanal
(C) 3-Cyanobutanal

- (B) 3-Formyl-2-methyl propne nitrile
(D) 2-Methyl-4-oxobutane nitrile

E-6.

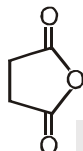


The IUPAC name of the compound is :

- (A) Propanoic anhydride
(C) Ethoxy propanoic acid

- (B) Dipropanoic anhydride
(D) 1-Oxopropyl propanoate

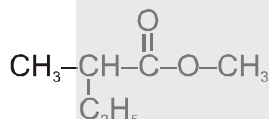
E-7. The IUPAC name of the compound is :



- (A) Cyclobutanedioic anhydride
(C) Cyclobutanedicarboxylic anhydride

- (B) Butanedicarboxylic anhydride
(D) Butanedioic anhydride

E-8. The correct IUPAC name of following compound is :



- (A) Methyl -2-ethylpropanoate
(C) Methyl- 2-methylbutanoate

- (B) Methyl butane-2-carboxylate
(D) Methoxypentanone

E-9. IUPAC name of the compound $\text{BrCH}_2-\text{CH}-\text{CO}-\text{CH}_2-\text{CH}_2\text{CH}_3$ is

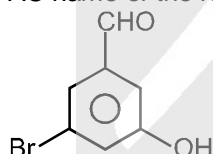


- (A) 2-Bromomethyl-3-oxohexanamide
(C) 1-Bromo-2-amido-n-propylketone

- (B) 1-Bromo-2-amido-3-oxohexane
(D) 3-Bromo-2-propionyl-propanamide

Section (F) : IUPAC-Nomenclature of Aromatic compounds

F-1. The IUPAC name of the following compound is :



- (A) 5-Bromo-3-hydroxybenzenecarbaldehyde
(B) 3-Bromo-5-formylphenol
(C) 3-Bromo-5-hydroxybenzenecarbaldehyde
(D) 1-Bromo-3-formyl-5-hydroxybenzene

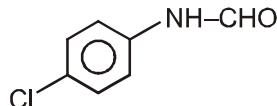
F-2.

IUPAC name of $\text{Cl}-\text{C}_6\text{H}_4-\text{C}(=\text{O})-\text{O}-\text{C}_6\text{H}_5$

- (A) 4-Chlorophenyl benzoate.
(C) Benzyl-4-chlorobenzenecarboxylate.

- (B) Phenyl-4-chlorobenzenecarboxylate.
(D) 4-Chloro diphenylcarboxylate.

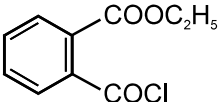
F-3. The correct IUPAC name of the compound.



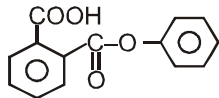
- (A) N-Formyl-4-chlorobenzenamine
(C) N-(4-chlorophenyl)methanamide

- (B) N-Formyl-4-chloroaniline
(D) N-(Parachlorophenyl)-N-formylaniline



- F-4. IUPAC name of the compound  is
- (A) 2-Chlorocarbonyl ethylbenzenecarboxylate (B) 2-Carboxyethylbenzoyl chloride
(C) Ethyl 2-(chlorocarbonyl)benzenecarboxylate (D) Ethyl 1-(chlorocarbonyl)benzenecarboxylate

- F-5. The correct IUPAC name of the compound



- (A) 2-Phenoxycarbonylbenzenecarboxylic acid (B) Phenyl-2-carboxybenzenecarboxylate
(C) 2-Benzoyloxybenzenecarboxylic acid (D) 2-Benzyloxybenzenecarboxylic acid

Section (G) : Structural Isomerism

- G-1. Isomers have essentially identical.
- (A) Structural formula (B) Chemical properties
(C) Molecular formula (D) Physical properties
- G-2. Compound with same molecular formula but different structural formula are called.
- (A) Isomers (B) Isotopes (C) Isobars (D) Isoelectric
- G-3. What is the correct relationship between the following compounds ?
- $\text{CH}_3 - \text{CH}_2 - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_2 - \text{CH}_3$, $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_2 - \text{CH}_3$
- (A) Chain isomers (B) Position isomers (C) Functional isomers (D) Identical
- G-4. What is the relation between 3-Ethylpentane and 3-Methylhexane ?
- (A) Chain isomers (B) Position isomers (C) Functional isomers (D) Relation
- G-5. $\text{CH}_3 - \text{CH}_2 - \text{NH} - \text{CHO}$; $\text{CH}_3 - \underset{\text{NH}_2}{\text{CH}} - \text{CHO}$
- I II
- Which type of isomerism is observed between I and II.
- (A) Chain isomers (B) Position isomers (C) Functional isomers (D) Metamers
- G-6. Molecular formula $\text{C}_4\text{H}_{10}\text{O}$ represent
- (A) Two primary alcohol (B) One secondary alcohol
(C) One tertiary alcohol (D) All of these

Section (H) : Number of Structural Isomers

- H-1. How many positional isomers are possible for dimethylcyclohexane ?
- (A) 3 (B) 4 (C) 5 (D) 6
- H-2. How many aromatic isomers are possible for trichlorobenzene ($\text{C}_6\text{H}_3\text{Cl}_3$) ?
- (A) 2 (B) 3 (C) 4 (D) 5
- H-3. The number of ether isomers represented by formula $\text{C}_4\text{H}_{10}\text{O}$ is (only structural)
- (A) 4 (B) 3 (C) 2 (D) 1
- H-4. Total number of 2° amine isomers of $\text{C}_4\text{H}_{11}\text{N}$ would be (only structural)
- (A) 4 (B) 3 (C) 5 (D) 2
- H-5. How many structural isomers of all the tertiary alcohols with molecular formula $\text{C}_6\text{H}_{14}\text{O}$.
- (A) 2 (B) 3 (C) 4 (D) 5
- H-6. The number of structural isomers for C_5H_{10} are :
- (A) 8 (B) 6 (C) 9 (D) 10
- H-7. The number of acyclic isomers of $\text{C}_3\text{H}_5\text{Cl}$ are :
- (A) 1 (B) 2 (C) 3 (D) 4
- H-8. The number of cyclic ketones of molecular formula $\text{C}_3\text{H}_4\text{O}$ are :
- (A) 2 (B) 1 (C) 3 (D) 4



- H-9. The number of cyclic isomers of molecular formula $C_3H_4Cl_2$ are :
 (A) 1 (B) 2 (C) 3 (D) 4
- H-10. The number of structural isomers of for C_4H_9Cl are :
 (A) 1 (B) 2 (C) 3 (D) 4

PART - III : MATCH THE COLUMN

1. Match the following :

	Column-I		Column-II
(A)		(p)	Homologs
(B)		(q)	Functional isomers.
(C)		(r)	Chain isomers.
(D)		(s)	Have same general formula
		(t)	Have same empirical formula.

2. Match the following :

	Column-I (Benzene derivative molecular formula) (Here \Rightarrow X, Y, Z monovalent substituents)		Column-II (No. of aromatic structural isomers)
(A)	$C_6H_4X_2$	(p)	6
(B)	C_6H_4XY	(q)	3
(C)	$C_6H_3X_3$	(r)	4
(D)	$C_6H_3X_2Y$	(s)	5
(E)	C_6H_3XYZ	(t)	10

Exercise-2

- Marked questions are recommended for Revision.

PART - I : ONLY ONE OPTION CORRECT TYPE

1. IUPAC name of the compound $CH_3CH_2CH_2CH_2 - \underset{\substack{| \\ CH_3}}{CH} - \underset{\substack{| \\ CHCH_3 \\ | \\ CH_2CH_3}}{CH} - CH_2 - \underset{\substack{| \\ CH_3}}{C} - CH_3$ is :
- (A) 2,2,5-Trimethyl-4-(1-methylpropyl) nonane
 (B) 4,8,8-Trimethyl-6-(1-methylpropyl) nonane
 (C) 3,6-Dimethyl-4-(1-methylene tertiary butyl) nonane
 (D) 6,6-Dimethyl-2-propyl-4-(1-methylpropyl) heptane
2. In the structure of 4-Isopropyl-2,4,5-trimethylheptane, number of 1° , 2° & 3° H's are respectively.
 (A) 18, 5, 4 (B) 21, 4, 3 (C) 18, 4, 3 (D) 21, 5, 4



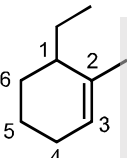
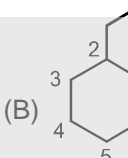
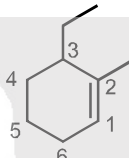
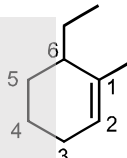
3. The correct IUPAC name of  is :

- (A) 1, 4-Diethyl-2-methyl-5-propylcyclohexane (B) 1, 4-Diethyl-5-methyl-2-propylcyclohexane
(C) 2, 5-Diethyl-1-methyl-4-propylcyclohexane (D) 2, 5-Diethyl-4-methyl-1-propylcyclohexane

4. IUPAC nomenclature of the given organic compound will be : $(\text{CH}_3)_2\text{C}(\text{CH}_2\text{CH}_3)\text{CH}_2\text{CH}(\text{Cl})\text{CH}_3$:

- (A) 5-Chloro 3, 3-dimethyl hexane (B) 4-Chloro-2-ethyl-2-methyl pentane
(C) 2-Chloro-4-ethyl-4-methyl pentane (D) 2-Chloro-4, 4-dimethyl hexane

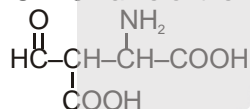
5. The correct IUPAC numbering in the compound  is :

- (A)  (B)  (C)  (D) 

6. The correct IUPAC name of  is :

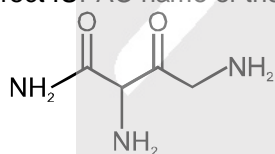
- (A) 1-Ethylidenecyclohex-2-ene (B) 3-Ethylidenecyclohex-1-ene
(C) 2-Ethylidenecyclohex-1-ene (D) 3-Ethenylcyclohex-1-ene

7. Correct IUPAC name of the following compound is



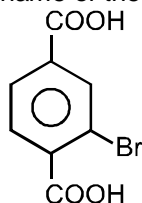
- (A) 2-Amino-3-Formyl butane-1,4-dioic acid (B) 2-formyl-3-amino butane-1,4-dioic acid
(C) 3-Amino-2-formyl butane-1,4-dioic acid (D) 2-Amino-3-carboxy-4-oxo butanoic acid

8. The correct IUPAC name of the compound is :



- (A) 1, 2, 3-Triaminobutane-1, 3-dione (B) 2, 4-Diamino-3-oxobutanamide
(C) 1, 3-Dioxobutane-1, 2, 4-triamine (D) 1, 3, 4-Triaminobutane-2, 4-dione

9. IUPAC name of the following molecule is


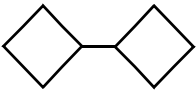
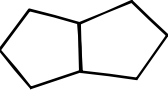
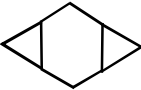


- (A) 2-Bromobenzene-1,4-dioic acid (B) 3-Bromobenzene-1,4-dicarboxylic acid
(C) 2-Bromobenzene-1,4-dicarboxylic acid (D) 3-Bromobenzene-1,6-dicarboxylic acid

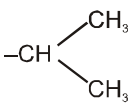
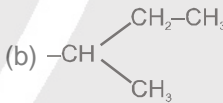
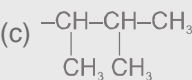
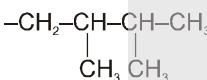

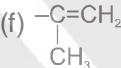
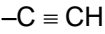
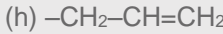
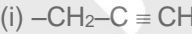
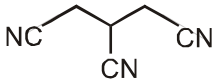
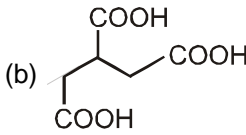
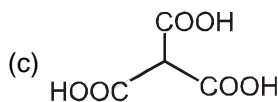
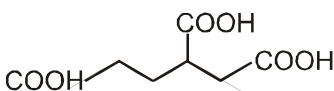
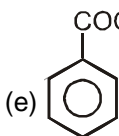
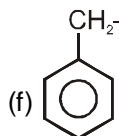
10. IUPAC name of picric acid is

- (A) 2,4,6-Trinitrobenzene carboxylic acid (B) 2,4-Dinitrobenzene carboxylic acid
(C) 2,4,6-Trinitrophenol (D) 2,4-Dinitrophenol



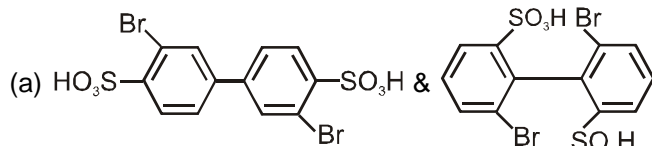
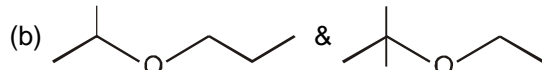
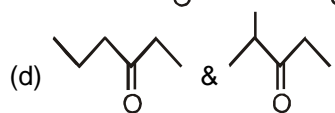
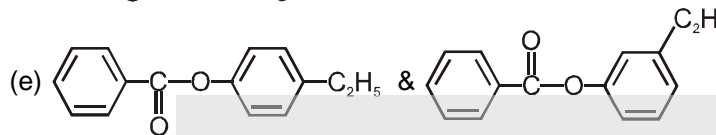
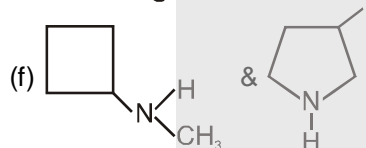
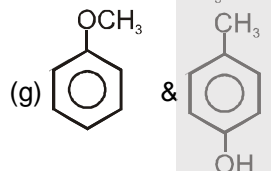
11. Which one of the compound is not isomer of others ?
- (A)  (B)  (C)  (D) 
12. What is the number of all (structurally isomeric) alkynes with molecular formula C_6H_{10} .
- (A) 6 (B) 7 (C) 8 (D) 9
13. Number of structurally isomeric ethers with molecular formula $C_5H_{12}O$.
- (A) 4 (B) 5 (C) 6 (D) 7
14. How many structural isomers are possible when one of the hydrogen is replaced by a chlorine atom in anthracene ?
- (A) 3 (B) 7 (C) 4 (D) 6
15. The number of structurally isomeric tribromo derivatives possible for benzene are :
- (A) 2 (B) 3 (C) 4 (D) 5





PART - II : NUMERICAL VALUE QUESTIONS

1. A hydrocarbon (R) has six membered ring in which there is no unsaturation. Two alkyl groups are attached to the ring adjacent to each other. One group has 3 carbon atoms with branching at 1st carbon atom of chain and another has 4 carbon atoms. The larger alkyl group has main chain of three carbon atoms of which second carbon is substituted. Number of 2° carbons in R are :
2. Number of correct names in the given substituents are :
- (a)  Ethylmethyl
- (b)  1-Methylpropyl
- (c)  2,3-Dimethylpropyl
- (d)  2,3-Dimethylbutyl
- (e)  Ethylidene
- (f)  2-Methylethenyl
- (g)  Ethynyl
- (h)  2-Propenyl
- (i)  Prop-1-ynyl
3. The number of compound(s) in which carbon atom of functional group can be counted in main chain is/are :
- (a) 
- (b) 
- (c) 
- (d) 
- (e) 
- (f) 
4. What is the degree of unsaturation in a compound with molecular formula $C_9H_6N_4$?



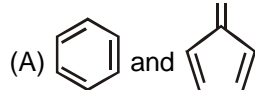
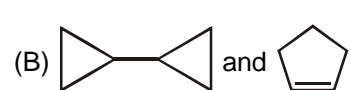
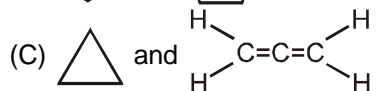
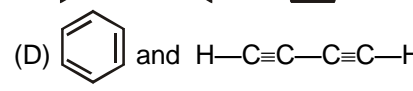


5. The no. of isomeric pairs with correct relationship specified are :

- (a)  Position isomers
- (b)  Metamers
- (c) $\text{CH}_3\text{-CH}_2\text{-C(=O)-H}$ & $\text{CH}_3\text{-C(=O)-CH}_3$ Functional isomere
- (d)  Position isomers
- (e)  Position isomers
- (f)  Functional isomers
- (g)  Functional isomers

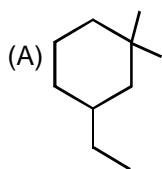
6.  How many structurally isomeric dibromo butanes are possible.
7. How many number of all structurally isomeric dienes with molecular formula C_5H_8 are possible.
8. How many structural alkenes of formula C_2FCIBrI are possible.
9.  How many aromatic benzene ring containing isomers of formula C_8H_{10} are possible.
10. How many tetramethyl benzene are possible.
11. How many structurally isomeric cyclic isomers of molecular formula $\text{C}_3\text{H}_7\text{N}$ are possible.
12.  The number of structurally isomeric ketones with molecular formula $\text{C}_6\text{H}_{12}\text{O}$ are :
13.  The number of structurally isomeric esters with molecular formula $\text{C}_5\text{H}_{10}\text{O}_2$ are.

PART - III : ONE OR MORE THAN ONE OPTION CORRECT TYPE

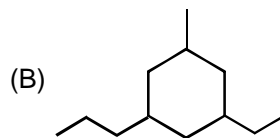
1.  All the members of a homologous series have same
 (A) Functional group (B) Empirical formula
 (C) General formula (D) All of these
2.  The pair of compounds having the same general formula.
- (A)  (B) 
- (C)  (D) 



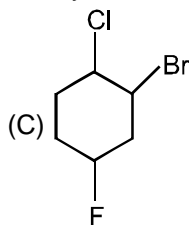
3. Which of the following IUPAC names are correct.



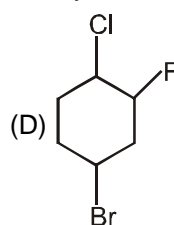
3-Ethyl-1,1-dimethylcyclohexane



1-Ethyl-3-methyl-5-propylcyclohexane



2-Bromo-1-chloro-4-fluorocyclohexane



1-Bromo-4-chloro-3-fluorocyclohexane

4. The compound with only primary hydrogen atoms is/are :

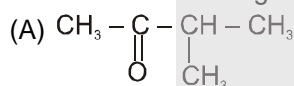
(A) Hexamethylcyclopropane

(B) Neohexane

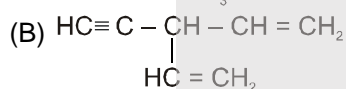
(C) Tetramethylbutane

(D) Hexamethylbenzene

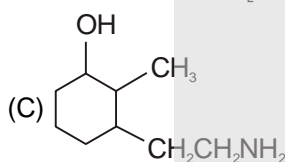
5. Which of the following is/ are incorrect IUPAC name/ (s) :



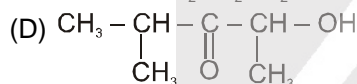
2-Methylbutan -3-one



3-Ethenylpent-1-en-4-yne

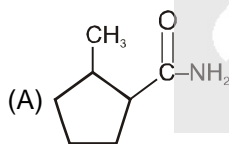


3- (2-Aminoethyl)-2-methylcyclohexan-1-ol

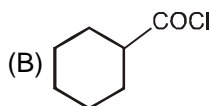


4-Methyl-3-oxopentan-2-ol

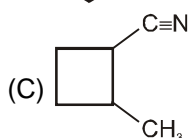
6. Which of the following IUPAC names are correct.



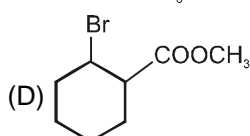
2-Methylcyclopentanecarboxamide.



Cyclohexanoyl chloride.



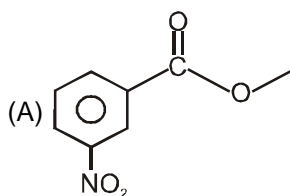
2-Methylcyclobutanecarbonitrile



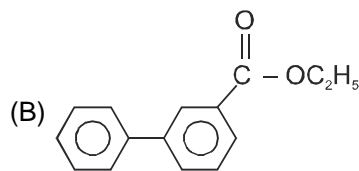
Methyl-2-bromocyclohexanecarboxylate



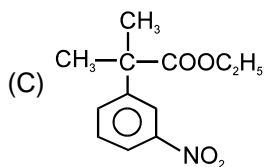
7. Which of the following IUPAC names are incorrect.



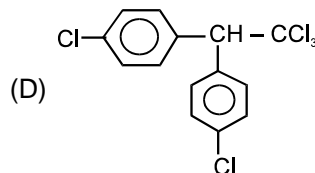
Methyl-3-nitrobenzenecarboxylate



Ethyl-3-phenylbenzene-1-carboxylate

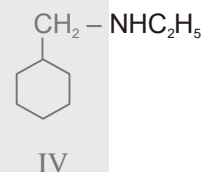
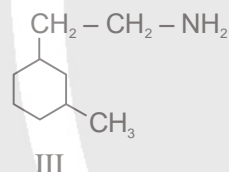
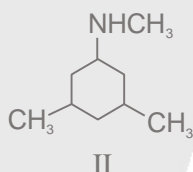
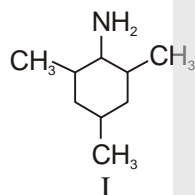


Ethyl-2-methyl-2-(3-nitrophenyl)ethanoate



1,1,1-Trichloro-2,2-bis(4-chlorophenyl) ethane

8. Which of the following is the correct relationship ?



(A) I & II are functional isomers.

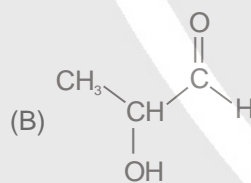
(B) II & IV are metamers.

(C) I & IV are position isomers.

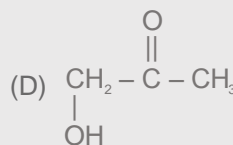
(D) I & III are chain isomers.

9. Which of the following are functional isomers of methyl ethanoate ?

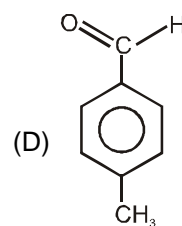
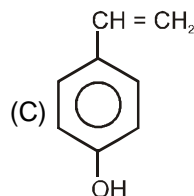
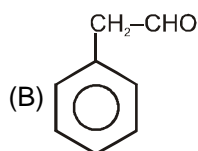
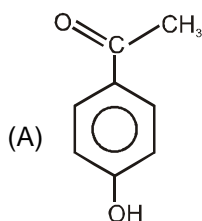
(A) $\text{CH}_3\text{-CH}_2\text{-COOH}$



(C) $\text{CH}_3\text{-O-CH}_2\text{-C(=O)-H}$



10. Which of the following can be the isomer(s) of $\text{C}_8\text{H}_8\text{O}$:



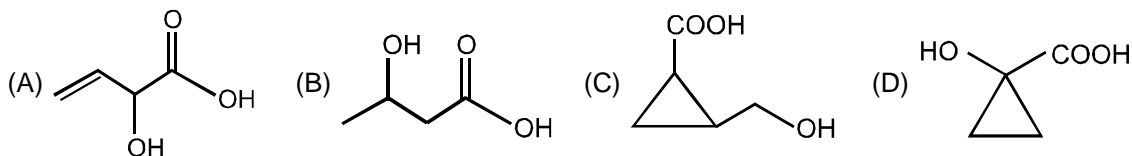


PART - IV : COMPREHENSION

Comprehension # 1 (Questions 1 to 2)

There are three isomeric compounds P, Q, R with molecular formula $C_4H_6O_3$. Compound P is a saturated hydroxy carboxylic acid. Compound Q is a symmetrical anhydride while R is an aldehydic ester.

1. Which of the following is P ?



2. Which of the following is the metamer of Q ?



Comprehension # 2 (Questions 3 to 5)

Q.3, Q.4 and Q.5 by appropriately matching the information given in the three columns of the following table.

Compounds	IUPAC Name	Common name
(I)	(i) Methoxy benzene	(P) Benzylalcohol
(II)	(ii) Phenyl methanoate	(Q) o-cresol
(III)	(iii) Phenylmethanol	(R) Phenyl formate
(IV)	(iv) 2-Methylphenol	(S) Anisole

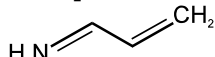
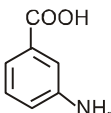
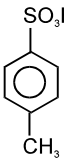
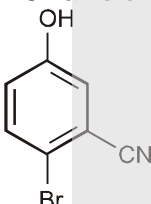
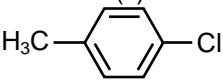
3. Which is not the correct combination for the names of the given compounds ?
 (A) (I) (iv) (Q) (B) (II) (iii) (P) (C) (III) (i) (R) (D) (IV) (i) (S)
4. The only correct combination in which benzoic acid is the functional isomer of the given compound?
 (A) (I) (iv) (Q) (B) (III) (i) (R) (C) (II) (iii) (P) (D) (III) (ii) (R)
5. Which combination is the homologue of phenyl ethanol?
 (A) (I) (iv) (Q) (B) (II) (iii) (P) (C) (III) (ii) (R) (D) (IV) (i) (S)



Exercise-3

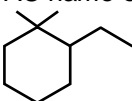
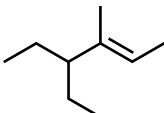
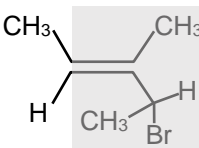
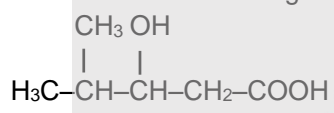
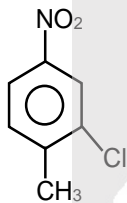
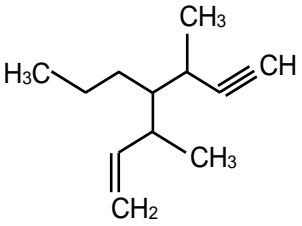
* Marked Questions are more than one correct options.

PART - I : JEE (ADVANCED) / IIT-JEE PROBLEMS (PREVIOUS YEARS)

1. Which of the following represent the given mode of hybridisation $sp^2-sp^2-sp-sp$ from left to right. [IIT-JEE 2003(S)]
 (A) $H_2C=CH-C\equiv N$ (B) $HC\equiv C-C\equiv CH$ (C) $H_2C=C=C=CH_2$ (D) 
2. Write IUPAC name of the following [IIT-JEE 2004]

3. Write IUPAC name of the following [IIT-JEE 2005]

4. The IUPAC name of C_6H_5COCl is : [IIT-JEE 2006]
 (A) Benzoyl chloride (B) Benzene chloro ketone
 (C) Benzene carbonyl chloride (D) Chloro phenyl ketone
5. The number of structural isomers for C_6H_{14} is : [IIT-JEE 2007]
 (A) 3 (B) 4 (C) 5 (D) 6
6. The IUPAC name of the following compound is : [IIT-JEE 2009]

 (A) 4-Bromo-3-cyanophenol (B) 2-Bromo-5-hydroxybenzonitrile
 (C) 2-Cyano-4-hydroxybromobenzene (D) 6-Bromo-3-hydroxybenzonitrile
7. The total number of cyclic isomers possible for a hydrocarbon with the molecular formula C_4H_6 is / are : [IIT-JEE 2010]
8. In allene (C_3H_4), the type(s) of hybridisation of the carbon atoms is (are) : [IIT-JEE 2012]
 (A) sp and sp^3 (B) sp and sp^2 (C) only sp^3 (D) sp^2 and sp^3
9. The carboxyl functional group ($-COOH$) is present in : [IIT-JEE 2012, 3/162]
 (A) picric acid (B) barbituric acid (C) ascorbic acid (D) aspirin
10. The correct combination of names for isomeric alcohols with molecular formula $C_4H_{10}O$ is/are [IIT-JEE 2014]
 (A) *tert*-butanol and 2-methylpropan-2-ol (B) *tert*-butanol and 1, 1-dimethylethan-1-ol
 (C) *n*-butanol and butan-1-ol (D) isobutyl alcohol and 2-methylpropan-1-ol
11. The IUPAC name(s) of the following compound is (are) [JEE-Advanced 2017, 3/160]

 (A) 4-methylchlorobenzene (B) 4-chlorotoluene
 (C) 1-chloro-4-methylbenzene (D) 1-methyl-4-chlorobenzene



PART - II : JEE (MAIN) ONLINE PROBLEMS (PREVIOUS YEARS)

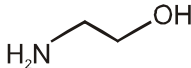
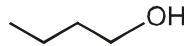
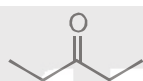
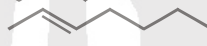
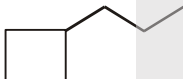

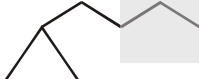
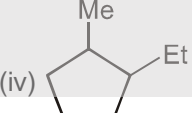
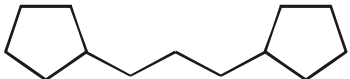
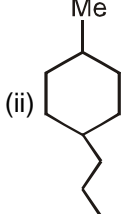
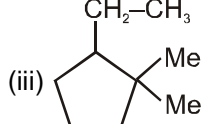
1. The IUPAC name of the following compound is : [JEE(Main) 2017 (08-04-17), 4/120]
- 
- (1) 1, 1-Dimethyl-2-ethylcyclohexane (2) 2-Ethyl-1,1-dimethylcyclohexane
(3) 2, 2-Dimethyl-1-ethylcyclohexane (4) 1-Ethyl-2,2-dimethylcyclohexane
2. The IUPAC name of the following compound is : [JEE(Main) 2018 (15-04-18), 4/120]
- 
- (1) 3-ethyl-4-methylhex-4-ene (2) 4,4-diethyl-3-methylbut-2-ene
(3) 4-methyl-3-ethylhex-4-ene (4) 4-ethyl-3-methylhex-2-ene
3. What is the IUPAC name of the following compound? [JEE(Main) 2019 (10-01-19), 4/120]
- 
- (1) 2-Bromo-3- methylpent-3-ene (2) 3-Bromo-1, 2-dimethylbut-1-ene
(3) 4-Bromo-3- methylpent-2-ene (4) 3-bromo-3-methyl-1, 2-dimethylprop-1-ene
4. The IUPAC name of the following compound is [JEE(Main) 2019 (08-04-19)S1, 4/120]
- 
- (1) 3-Hydroxy-4-methylpentanoic acid (2) 2-Methyl-3-hydroxypentan-5-oic acid
(3) 4,4-Dimethyl-3-hydroxybutanoic acid (4) 4-Methyl-3-hydroxypentanoic acid
5. The correct IUPAC name of the following compound is : [JEE(Main) 2019 (09-04-19)S1, 4/120]
- 
- (1) 3-chloro-4-methyl-1-nitrobenzene (2) 5-chloro-4-methyl-1-nitrobenzene
(3) 2-methyl-5-nitro-1-chlorobenzene (4) 2-chloro-1-methyl-4-nitrobenzene
6. The IUPAC name for the following compound is : [JEE(Main) 2019 (12-04-19)S2, 4/120]
- 
- (1) 3-methyl-4-(3-methylprop-1-enyl)-1-heptyne (2) 3,5-dimethyl-4-propylhept-1-en-6-yne
(3) 3,5-dimethyl-4-propylhept-6-en-1-yne (4) 3-methyl-4-(1-methylprop-2-ynyl)-1-heptene



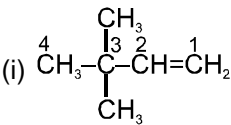
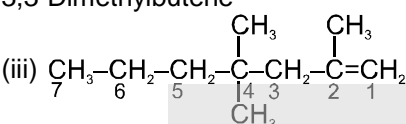
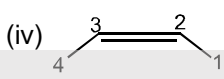
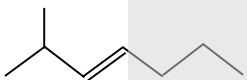
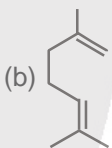
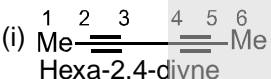
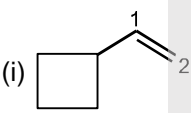
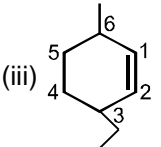
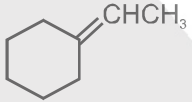
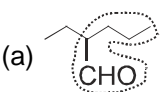
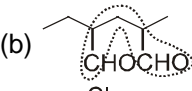
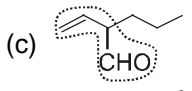
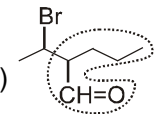
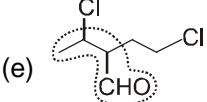
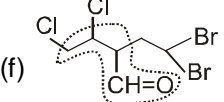
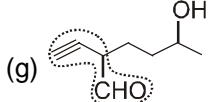
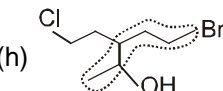
Answers

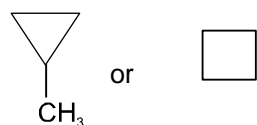
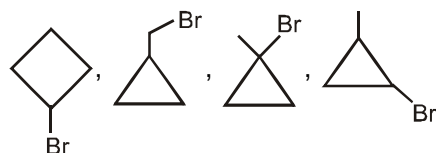
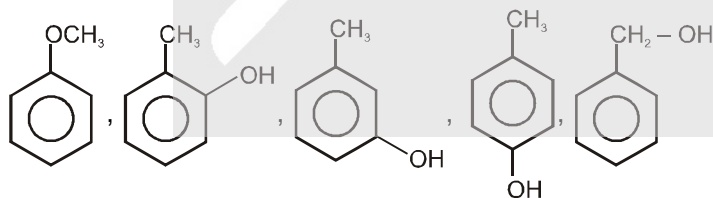
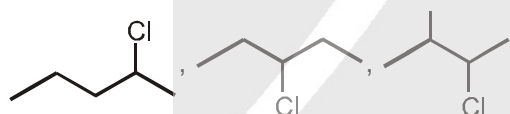
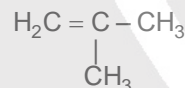
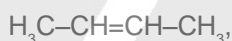
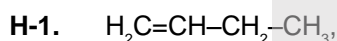
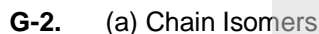
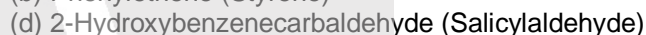
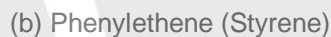
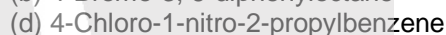
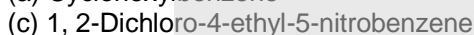
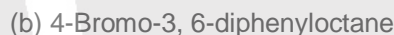
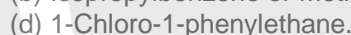
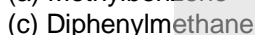
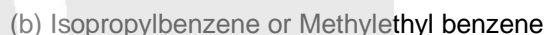
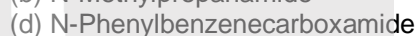
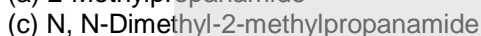
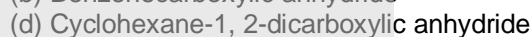
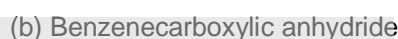
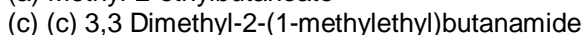
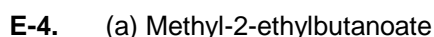
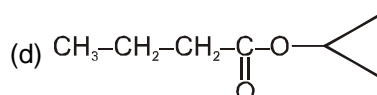
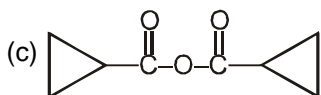
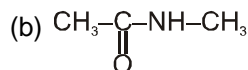
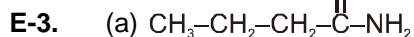
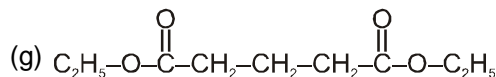
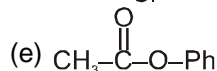
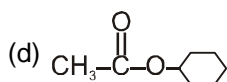
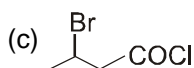
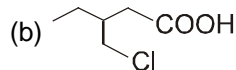
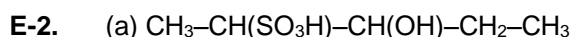
EXERCISE - 1

PART - I

- A-1.** (a) 19 σ bonds, 6 π bonds (b) 22 σ bonds (c) 20 σ bonds
- A-2.** (a) 1° H \rightarrow 9, 3° H \rightarrow 1 (b) 1°H \rightarrow 6, 2°H \rightarrow 2 (c) 1°H \rightarrow 6, 2°H \rightarrow 4
- A-3.** $\text{CH}_2 = \text{C} = \text{CH} - \text{CH}_2 - \text{C} \equiv \text{C} - \text{CH}_2 - \text{NH}_2$
 $\uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow \quad \uparrow$
 $sp^2 \quad sp \quad sp^2 \quad sp^3 \quad sp \quad sp \quad sp^3$
- A-4.** (1) $\text{H}_2\text{N}-\text{CH}_2-\text{CH}_2-\text{OH}$ and 
 (2) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{OH}$ and 
 (3) $\text{CH}_3-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{CH}_2-\text{CH}_3$ and 
 (4) $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_3$ and 
- A-5.** (a) = 1, (b) = 5
- A-6.** (a) 4, (b) 4, (c) 2
- A-7.** (a) $\text{H}-\text{COOH}$, CH_3-COOH , $\text{CH}_3-\text{CH}_2-\text{COOH}$, $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{COOH}$
 (b) $\text{CH}_2=\text{CH}_2$, $\text{CH}_3-\text{CH}=\text{CH}_2$, $\text{CH}_3-\text{CH}_2-\text{CH}=\text{CH}_2$, $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}=\text{CH}_2$
 (c) $\text{CH}_3-\text{CO}-\text{CH}_3$, $\text{CH}_3-\text{CO}-\text{C}_2\text{H}_5$, $\text{C}_2\text{H}_5-\text{CO}-\text{C}_2\text{H}_5$, $\text{C}_3\text{H}_7-\text{CO}-\text{C}_2\text{H}_5$
- A-8.** (a) Homocyclic, alicyclic, saturated (b) Homocyclic, aromatic, unsaturated
 (c) Heterocyclic, alicyclic, saturated (d) unsaturated.
- A-9.** (a) 2° (b) 2° (c) 3° (d) 3°
- A-10.** (a) 2° (b) 3° (c) 1°
- B-1.** (a) 2-Methyl propane (b) 2, 2-Dimethyl propane (c) 2, 2-Dimethyl butane
- B-2.** (a) 5-Ethyl-3-methyloctane (b) 4-Ethyl-2,2,6-trimethylheptane
- B-3.** (i) 
 Propyl cyclobutane
 (ii) 
 Propyl cyclopropane
 (iii) 
 1-Cyclopropyl butane
 (iv) 
 1-Ethyl-2-methyl cyclopentane
- B-4.** (i) 4-Ethyl-4,5-dimethyldecane (ii) 4-(1,1-Dimethylethyl)-5-(1-methylethyl) octane
- B-5.** (i) 
 (ii) 
 (iii) 
- B-6.** (a) s-Butylcyclohexane (b) t-Butylcyclohexane
 (c) Isopropylcyclohexane (d) Neopentylcyclopentane



- B-7.** (a) ring (b) side chain (c) ring
(d) ring (e) side chain (f) side chain
- B-8.** (a) Isopropyl group (b) Secondary-butyl group (c) Tertiary-butyl group
(d) Ethyl group (e) n-propyl group
- C-1.** General formula $\rightarrow C_nH_{2n}$
 $H_2C = CH_2$ Ethene
 $CH_3-CH=CH_2$ Propene
 $CH_3-CH_2-CH=CH_2$ 1-Butene
- C-2.** (i)  3,3-Dimethylbutene
(ii) $CH_2=CH-CH=CH_2$ Buta-1,3-diene
(iii)  2,4,4-Trimethylheptene
(iv)  But-2-ene
- C-3.** (a)  (b) 
- C-4.** (i) 5-Methylhexyne (ii) 3-Methylbutyne (iii) 4-Methylpent-2-yne
- C-5.** (i)  Hexa-2,4-diyne
(ii) $CH_3-CH=CH-C\equiv CH$ Pent-3-en-1-yne
(iii) $CH\equiv C-CH_2-CH=CH$ Pent-1-en-4-yne
(iv) $CH_2=CH-C\equiv C-CH_3$ Pent-1-en-3-yne
- C-6.** (i)  1-cyclobutylethene (ii) 1-(Hex-3-enyl)cyclohex-1-ene
(iii)  3-Ethyl-6-methyl cyclohexene (iv)  Ethylidene cyclohexane
- D-1.** (a) 3-Chlorobutan-2-ol (b) 2-Ethylbut-3-en-1-ol
(c) 5-Aminomethyl-3-ethylheptan-2-ol (d) 3-Butylpentane-2,4-dione
(e) 5-Oxoheptane-3-sulphonic acid. (f) 3-(2-Bromoethyl)hexan-2-ol
(g) 2,5-Dichloro-3-ethoxy-4-methoxyhexane (h) 3-Bromo-4-methylpentane-2-sulphonic acid
- D-2.** (a) $CH_3-CH_2-CH_2-CH_2-OH$ (b) $CH_3-CH(SH)-CH_2-CH_3$
(c) $CH_3-CH(NH_2)-CH_2-CH_2-CH_3$ (d) $CH_3-CO-CH_2-CH_2-CH_3$
(e) $HO-CH_2-CH_2-CH(Cl)-CH_2-CH_3$ (f) $CH_3-CO-CH_2-CO-CH_2-CH_3$
- E-1.** (a)  (b)  (c)  (d) 
(e)  (f)  (g)  (h) 



**PART - II**

- | | | | | |
|-----------------|-----------------|------------------|-----------------|-----------------|
| A-1. (C) | A-2. (C) | A-3. (D) | A-4. (C) | A-5. (D) |
| B-1. (C) | B-2. (A) | B-3. (C) | B-4. (B) | B-5. (C) |
| C-1. (D) | C-2. (C) | C-3. (C) | C-4. (B) | D-1. (B) |
| D-2. (A) | D-3. (B) | D-4. (D) | E-1. (A) | E-2. (C) |
| E-3. (C) | E-4. (C) | E-5. (D) | E-6. (A) | E-7. (D) |
| E-8. (C) | E-9. (A) | F-1. (C) | F-2. (B) | F-3. (C) |
| F-4. (C) | F-5. (A) | G-1. (C) | G-2. (A) | G-3. (A) |
| G-4. (A) | G-5. (C) | G-6. (D) | H-1. (B) | H-2. (B) |
| H-3. (B) | H-4. (B) | H-5. (B) | H-6. (D) | H-7. (C) |
| H-8. (B) | H-9. (B) | H-10. (D) | | |

PART - III

1. (A → p,s); (B → q,s,t); (C → r,s,t); (D → q,s,t) 2. (A → q); (B → q); (C → q); (D → p); (E → t)

EXERCISE - 2**PART - I**

- | | | | | |
|---------|---------|---------|---------|---------|
| 1. (A) | 2. (B) | 3. (A) | 4. (D) | 5. (D) |
| 6. (B) | 7. (A) | 8. (B) | 9. (C) | 10. (C) |
| 11. (D) | 12. (B) | 13. (C) | 14. (A) | 15. (B) |

PART - II

- | | | | | |
|-------|-------|-------|------|-------|
| 1. 5 | 2. 5 | 3. 1 | 4. 9 | 5. 4 |
| 6. 6 | 7. 6 | 8. 3 | 9. 4 | 10. 3 |
| 11. 4 | 12. 6 | 13. 9 | | |

PART - III

- | | | | | |
|------------|------------|------------|--------------|-------------|
| 1. (A,C) | 2. (A,B,D) | 3. (A,B,C) | 4. (A,C,D) | 5. (A,B,D) |
| 6. (A,C,D) | 7. (C) | 8. (A,B,D) | 9. (A,B,C,D) | 10. (B,C,D) |

PART - IV

- | | | | | |
|--------|--------|--------|--------|--------|
| 1. (D) | 2. (B) | 3. (C) | 4. (D) | 5. (B) |
|--------|--------|--------|--------|--------|

EXERCISE - 3**PART - I**

- | | | |
|--------|------------------------|----------------------------------|
| 1. (A) | 2. 3-Aminobenzoic acid | 3. 4-Methylbenzenesulphonic acid |
| 4. (C) | 5. (C) | 6. (B) |
| 7. 5 | 8. (B) | |
| 9. (D) | 10. (ACD) | 11. (BC) |

PART - II

- | | | | | |
|--------|--------|--------|--------|--------|
| 1. (2) | 2. (4) | 3. (3) | 4. (1) | 5. (4) |
| 6. (2) | | | | |