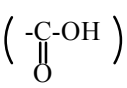
Class: Reneet *Subject: Chemistry* *DPP*

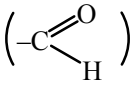
IUPAC Nomenclature & structural Isomerism

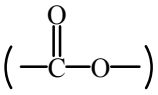
Exercise # 2

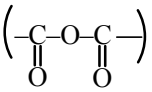
PART - I : OBJECTIVE QUESTIONS

1. A compound of molecular formula $C_6H_{12}O_3$ can never have a functional group-

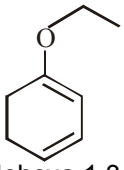
(A) Carboxylic acid 

(B) Aldehyde 

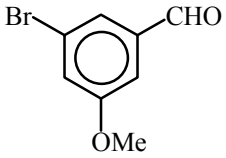
(C) Ester 

(D) Anhydride 

2. IUPAC name of the compound is :

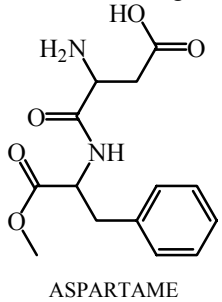


(A) 1-Ethoxycyclohexa-1,3-diene
(B) 1-Ethoxycyclohexa-1,5-diene
(C) 2-Ethoxycyclohexa-1,5-diene
(D) 4-Ethoxycyclohexa-1,3-diene

3. Correct IUPAC name for the compound  is :

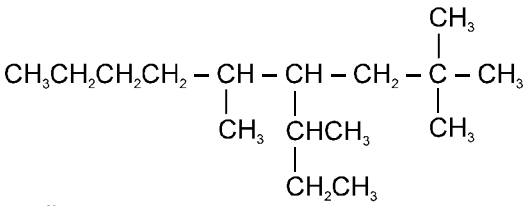
(A) 3-Methoxy-5-bromobenzenecarbaldehyde
(B) 3-Formyl-5-bromophenylmethylether
(C) 3-Formyl-5-bromo-1-methoxybenzene
(D) 3-Bromo-5-methoxybenzenecarbaldehyde

4. Number of functional groups present in ASPARTAME are -



ASPARTAME

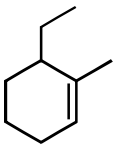
(A) 4 (B) 5 (C) 7 (D) 6

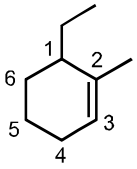
5. IUPAC name of the compound  is

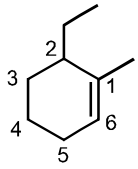
(A) 2,2,5-Trimethyl-4-(1-methylpropyl)nonane
(B) 4,8,8-Trimethyl-6-(1-methylpropyl)nonane
(C) 3,5-Dimethyl-4-(1-methylene tertiary butyl)nonane
(D) 6,6-Dimethyl-2-propyl-4-(1-methylpropyl)heptane

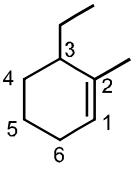
6. In the structure of 4-Isopropyl-2,4,5-trimethylheptane, number of 1^0, 2^0 & 3^0 H's are respectively-

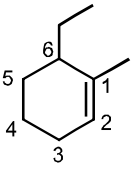
(A) 18, 5, 4 (B) 21, 4, 3 (C) 18, 4, 3 (D) 21, 5, 4

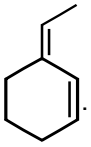
7. The correct IUPAC numbering in the compound  is :

(A) 

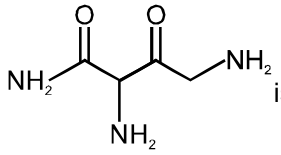
(B) 

(C) 

(D) 

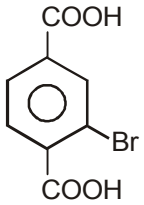
8. The correct IUPAC name of  .

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

9. 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

10. 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

11. What is the number of all structurally isomeric alkynes with molecular formula C_6H_{10}?

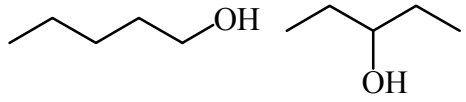
(A) 6 (B) 7 (C) 8 (D) 9

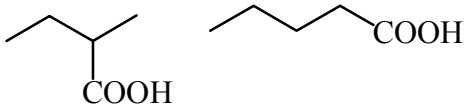
12. How many structural isomers are possible when one of the hydrogen is replaced by a chlorine atom in an thracene ?

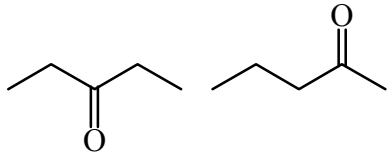
(A) 3 (B) 7 (C) 4 (D) 6

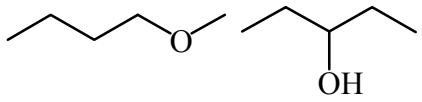
13. The number of structural isomers possible from the molecular formula $C_2H_2FClBrI$ are-
(A) 3 (B) 5 (C) 7 (D) 9

14. Which of the following represent functional isomers ?

(A) 

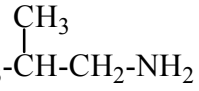
(B) 

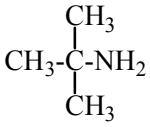
(C) 

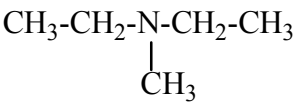
(D) 

15. Which one of the following is a functional isomer of $CH_3–CH_2–CH_2–CH_2–NH_2$?

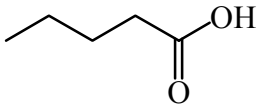
(A) $CH_3–CH_2–NH–CH_2–CH_3$

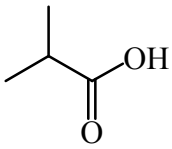
(B) 

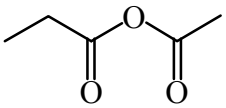
(C) 

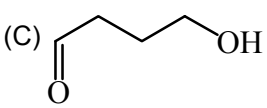
(D) 

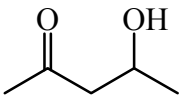
16. Number of structure isomers of molecular formula C_5H_{10} having one π-bond are-
(A) 2 (B) 3 (C) 5 (D) 4

17. Compound which is functional isomer of  is-

(A) 

(B) 

(C) 

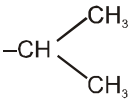
(D) 

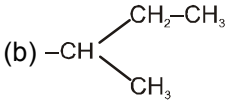
PART - II : NUMERICAL TYPE QUESTIONS

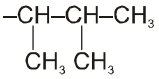
1. Possible number of compounds with different structures and IUPAC name p_1-bromo -p_2-methyl butanoic acid. Where p_i represents position of side chains/substituents?

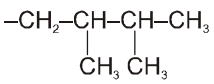
2. The number of structurally isomeric compound(s) possible with molecular formula C_8H_{18} containing 5 carbons in main chain and having methyl group(s) as side chain are **-**

3. Number of correct names in the given substituents are :

(a) 
Ethylmethyl

(b) 
1-Methylpropyl

(c) 
2,3-Dimethylpropyl

(d) 
2,3-Dimethylbutyl

(e) = CH–CH_3
Ethylidene

(f) 
2-Methylethenyl

(g) $–C \equiv CH$
Ethynyl

(h) $–CH_2–CH=CH_2$
2-Propenyl

(i) $–CH_2–C \equiv CH$
Prop-1-ynyl

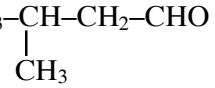
PART- 1 : PAPER JEE (MAIN) PATTERN

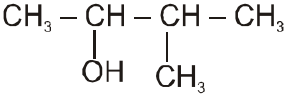
SECTION–I : (Maximum Marks : 80)

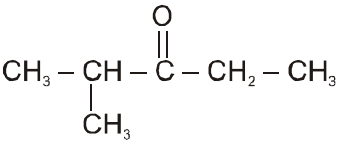
- This section contains **TWENTY** questions.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is correct.
- For each question, darken the bubble corresponding to the correct option in the ORS.
- For each question, marks will be awarded in one of the following categories :
  Full Marks : +4 If only the bubble corresponding to the correct option is darkened.
  Zero Marks : 0 If none of the bubbles is darkened.
  Negative Marks : –1 In all other cases

1. Which of the following compounds has wrong IUPAC name?

(A) $CH_3 - CH_2 - CH_2 - COO - CH_2CH_3$ → Ethyl butanoate

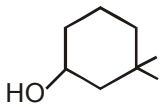
(B)  → 3-Methylbutanal

(C)  → 2-Methyl-3-butanol

(D)  → 2-Methyl-3-pentanone

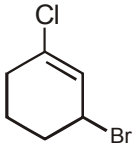
2. The general formula $C_nH_{2n}O_2$ could be for open chain

(A) diketones (B) carboxylic acids (C) diols (D) dialdehydes.

3. The IUPAC name of the compound  is

(A) 3,3-dimethyl-1-hydroxycyclohexane (B) 1,1-dimethyl-3-hydroxycyclohexane
(C) 3,3-dimethyl-1-cyclohexanol (D) 1,1-dimethyl-3-cyclohexanol

4. The IUPAC name of the compound shown below is



(A) 2-Bromo-6-chlorocyclohex-1-ene (C) 6-Bromo-2-chlorocyclohexene
(C) 3-Bromo-1-chlorocyclohex-1-ene (D) 1-Bromo-3-chlorocyclohexene

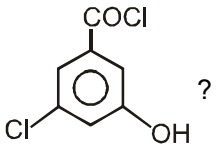
5. How many position isomers are possible for chlorophenol ?
(A) 2 (B) 3 (C) 4 (D) 5

6. Which of the following is correct IUPAC name?
(A) 2-Bromo cyclohex-5-ene carbaldehyde (B) Ethyl-2-vinyl pentanoate
(C) 5-Bromo-3-chlorohept-3-ene (D) 2-Ethenylhexa-1,5-diene

7. $Me-O-\overset{\overset{O}{\|}}{C}-Me$ and $Et-O-CH=O$ are :
(A) Functional isomers (B) Metamers (C) Positional isomers (D) Chain isomers

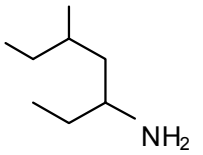
8. How many structurally isomeric carbonyl compounds are possible with molecular formula $C_5H_{10}O$?
(A) 5 (B) 6 (C) 7 (D) 8

9. A compound having straight chain of five carbon atoms has one ketone group and two methyl groups on different-different carbon atoms. The IUPAC name of the compound is :
(A) 2,4-Dimethyl-3-oxopentane (B) 2,4-Dimethylpentan-3-one
(C) 3,4-Dimethyl-2-oxopentane (D) 3,3-Dimethylpentan-2-one

10. What is the IUPAC name of  ?

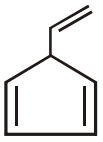
(A) 5-Chloro-3-hydroxybenzenecarbonyl chloride
(B) 3-Hydroxy-5-chlorobenzenecarbonyl chloride
(C) 3-Chloro-5-hydroxybenzenecarbonyl chloride
(D) 1-Chlorocarbonyl-3-chlorobenzen-1-ol

11. The correct IUPAC name of compound is :



(A) 3-Amino-6-bromocyclohexane-1-carboxylic acid
(B) 2-Bromo-5-aminocyclohexane-1-carboxylic acid
(C) 5-Amino-2-bromocyclohexane-1-carboxylic acid
(D) 5-Amino-2-bromocyclohexanoic acid

12. The IUPAC name of $CH_3-CH_2-\underset{\underset{Ph}{|}}{N}-CH_3$ is :
(A) N-Ethyl-N-phenyl methanamine (B) N-Ethyl-N-methyl aniline
(C) N-Methyl-N-phenyl ethanamine (D) N-Methyl-N-ethyl aniline

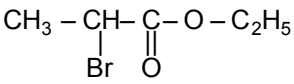
13. IUPAC name of  is

(A) 5-ethenylcyclopenta-1,3-diene
(B) 3-ethenylcyclopenta-1,4-diene
(C) 1-ethenylcyclopenta-2,4-diene
(D) 2-ethenylcyclopenta-1,3-diene

14. How many carboxylic acid structure isomers are possible with $C_5H_{10}O_2$?

(A) 3 (B) 4 (C) 5 (D) 8

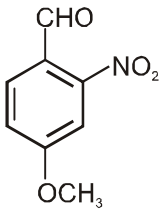
15. Correct IUPAC name of given ester is:



(A) Ethyl 2–bromopropanoate
(B) 2–Bromoethylpropanoate
(C) Ethyl 1–bromoethanoate
(D) 2–Bromo ethoxyethanecarboxylate

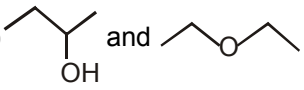
16. Relation between Ethyl benzenecarboxylate and Phenyl propanoate is :

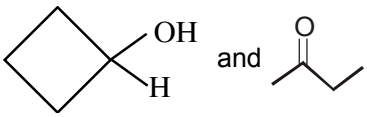
(A) Metamers
(B) Functional isomers
(C) Chain isomers
(D) Homologues

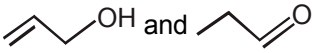
17. The correct IUPAC name of the compound  is :

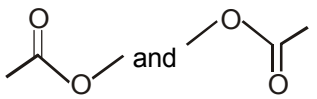
(A) 4-Methoxy-2-nitrobenzaldehyde
(B) 4-Formyl-3-nitro anisole
(C) 4-Methoxy-6-nitrobenzaldehyde
(D) 2-Formyl-5-methoxy nitrobenzene

18. Which of the following pair of compounds is not functional isomers ?

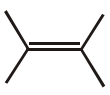
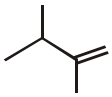
(A) 

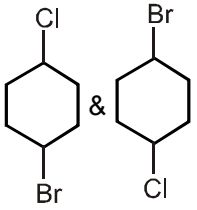
(B) 

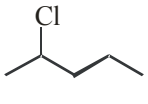
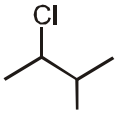
(C) 

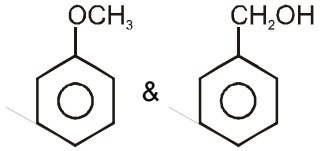
(D) 

19. Which of the following is correctly matched?

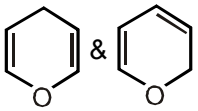
(A)  &  chain somer

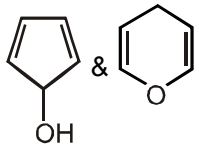
(B)  Identical

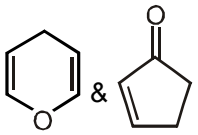
(C)  &  Positional isomer

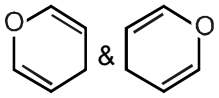
(D)  Metamer

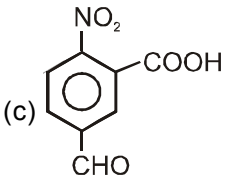
20. Which of the following pairs of structures do not represent isomers ?

(A) 

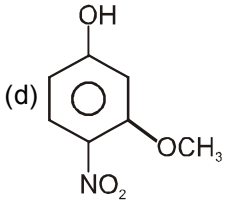
(B) 

(C) 

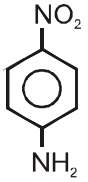
(D) 

(c) 

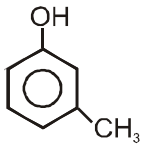
3-Formyl-5-nitrobenzenecarboxylic acid

(d) 

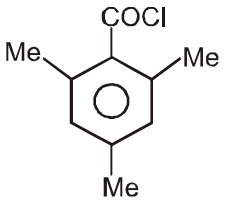
1-Hydroxy-3-methoxy-4-nitrobenzene

(e) 

4-Amino-1-nitrobenzene

(f) 

3-Methylphenol

(g) 

2,4,6-Trimethylbenzenecarbonlychloride

16. How many alkynes isomers are formed with molecular formula C_4H_6 ?

17. Possible number of compounds with IUPAC name P_1-bromo -P_2-methyl propanoic acid where P_i represents position of side chains/substituents are ?

18. The number of possible alkynes (strucutral only) for the compound having molecular formula $C_3FClBrI$ is :

PART - 3 : OLYMPIAD (PREVIOUS YEARS)

STAGE - I (NATION STANDARD EXAMINATION IN CHEMISTRY (NSEC))

1. The compound 2-Chloro-3-methyl-1-butanol has the following formula **(NSEC-2006)**

(A) $CH_3CH(CH_3)CHClCH_2OH$ (B) $CH_3CHOHCH(CH_3)CH_2Cl$

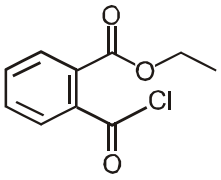
(C) $CH_2ClC(CH_3)_2CH_2OH$ (D) $CH_3CHClCH(CH_3)CH_2OH$.

2. How many different alcohols (not including optical isomers) are possible with the molecular formula : $C_4H_{10}O$? **(NSEC-2006)**

(A) 3 (B) 4 (C) 5 (D) 6

3. The C–C–H bond angle in ethylene is : **(NSEC-2007)**

(A) 180^0 (B) 109^028^0 (C) 120^0 (D) 90^0

4. The IUPAC name of  is : **(NSEC-2007)**

(A) 2–Chlorocarbonylethyl benzoate (B) 2–Carboxyethylbenzoylchloride

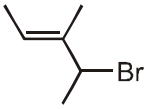
(C) Ethyl 2–(chlorocarbonyl) benzoate (D) Ethyl 1–(chlorocarbonyl) benzoate

5. How many sigma bonds and pi bonds are present in $CH_2=C=CH_2$? **(NSEC-2007)**

(A) 6 sigma and 1pi (B) 8 sigma and 0 pi

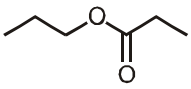
(C) 4 sigma and 4 pi (D) 6 sigma and 2 pi

6. The number of ether metamers represented by the molecular formula $C_4H_{10}O$ are : **(NSEC-2009)**
(A) 1 (B) 2 (C) 3 (D) 4

7. The IUPAC name of  is : **(NSEC-2009)**

(A) 2-Bromo-3-methylbut-3-ene (B) 4-Bromo-3-methylpent-2-ene
(C) 2-Bromo-3-methylpent-3-ene (D) 4-Bromo-2,3-dimethylbut-2-ene

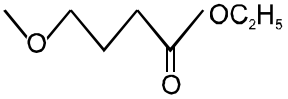
8. The IUPAC name of the following compound is : **(NSEC-2010)**



(A) n-Propyl ethanoate (B) Ethyl propanoate
(C) Pentanoic anhydride (D) n-Propyl propanoate

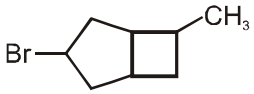
9. The number of isomers of dibromobiphenyl (Biphenyl = C_6H_5-C_6H_5) is **(NSEC-2011)**
(A) 8 (B) 10 (C) 12 (D) 4

10. The IUPAC name of the following compound is : **(NSEC-2011)**

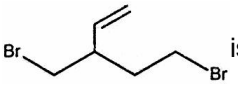


(A) 3-Methoxy ethylpropanoate (B) Ethyl 4-methoxybutanoate
(C) 1,4-Diethoxybutane (D) Ethoxy 3-methoxybutyrate

11. The correct IUPAC name of the following compound is : **(NSEC-2012)**

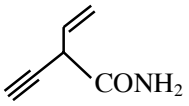


(A) 2-Bromo-5-methylbicyclo[5.4.0]heptanes (B) 3-Bromo-7-methylbicyclo[3.2.0]heptane
(C) 3-Bromo-6-methylbicyclo[3.2.0]heptane (D)2-Methyl-6-bromobicyclo[2.3.0]heptane

12. The IUPAC name of the following compounds  is **(NSEC-2014)**

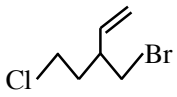
(A) 5-Bromo-3-(bromomethyl) pent-1-ene (B) 3-(1-Bromomethyl)-4-bromobut-1-ene
(C) 1,4-Dibromo-3-ethenylbutane (D) 1-Bromo-3-(bromomethyl) but-4-ene

13. The IUPAC name of the following compound is **(NSEC-2016)**



(A) 3-Aminocarbonylpent-1-en-4-yne (B) 2-Ethenylbut-3-yn-1-amide
(C) 2-Ethynylbut-3-en-1-amide (D) 3-Aminocarbonylpent-4-en-1-yne

14. The IUPAC name of the following compound is **(NSEC-2018)**



(A) 1-Bromo-4-chloro-3-ethenylbutane (B) 4-Bromo-1Chloro-3-ethenylbutane
(C) 3-(Bromomethyl)-5-chloropent-1-ene (D) 3-(Bromomethyl)-1-chloropent-4-ene