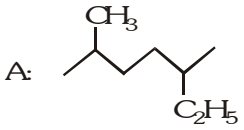
SELECT THE CORRECT ALTERNATIVE (ONLY ONE CORRECT ANSWER)

1. IUPAC name of the hydrocarbon (A) is :

A: 

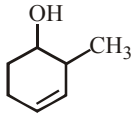
(A) 2-ethyl-5methylhexane (B) 5-ethyl-2methylhexane

(C) 2, 5-dimethylheptane (D) 5-ethyl-2,5-dimethylpentane

2. IUPAC name of neopentyl group is :

(A) 2,2-dimethylbutyl (B) 2, 2-dimethylpropyl (C) 1, 1-dimethylbutyl (D) 1, 1-dimethylpropyl

3. IUPAC name of the following compouund is :



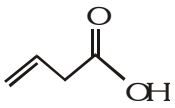
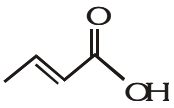
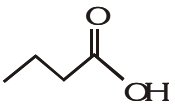
(A) 2-methyl-3-cyclohexenol (B) 3-methyl-1-cyclohexen-4-ol

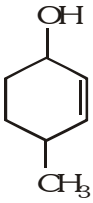
(C) 4-hydroxy-3-methyl-1-cyclohexene (D) 2-hydroxy-1-methylcyclohexene

4. Which compound is tertiary alcohol ?

(A) 1-propanol (B) 2-methyl-1-hexanol (C) 3-methyl-2-hexanol (D) 2-methyl-2-hexanol

5. 3-Butenoic acid (or But-3-enoic acid) is represented as :

(A)  (B)  (C)  (D) none of these

6. In the nomenclature of  priority order is –

(A) $-CH_3$ < –OH < C=C (first) (B) –OH<$-CH_3$ < C=C (first)

(C) C=C<$-CH_3$ <–OH (first) (D) $-CH_3$ < C=C < – OH (first)

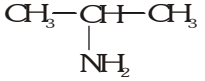
7. $C_4H_8O_2$ represents :-

(A) An acid only (B) An ester only

(C) An ketone only (D) An acid and an ester also

8. The higher homologue of dimethylamine ($CH_3—NH—CH_3$) has the structure :-

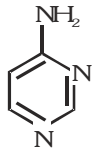
(A) $(CH_3)_3N$ (B) $CH_3—CH_2—CH_2—NH_2$

(C) $CH_3—NH—CH_2—CH_3$ (D) 

9. The third member of the family of alkenynes has the molecular formula :-

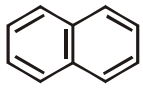
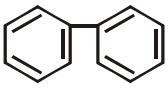
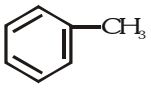
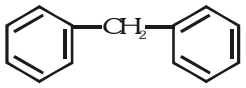
(A) C_3H_2 (B) C_5H_6 (C) C_6H_8 (D) C_4H_4

10. The hetero atoms present in the following compound is/are :



(A) 2 (B) 3 (C) 1 (D) 4

11. Which of the following have only 2 H-atom :

(a)  (b)  (c)  (d) 

Correct code is :

(A) only a and b (B) a, b and d (C) a, c and d (D) All of them

12. Common name of $CH_2{=}CH{-}CN$ is :-

(a) acrylonitrile (b) vinyl cyanide

(c) allyl cyanide (d) allyl nitrile

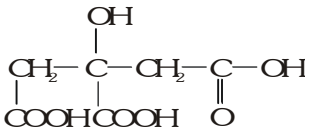
(A) a, b and d (B) a and b (C) only b (D) a, b and c

13. Which of the following names is correct :-

(A) 4–Isopropyl–3–methyl hexane (B) 2–Ethyl–3–isopropyl pentane

(C) 3–Isopropyl–4–methyl hexane (D) 3–Ethyl–2,4–dimethyl hexane

14. The correct systematic IUPAC name of the given compound is :



(A) 3–Carboxy–3–hydroxy butane dioic acid (B) 2–Hydroxy propane–1,2,3–tricarboxylic acid

(C) 3–Hydroxy butane dioic acid (D) 2–Bis(carboxymethyl)–2–hydroxy ethanoic acid

15. The IUPAC name of $CH_3{-}CH_2{-}NH{-}CH_3$ is :-

(A) Methyl ethyl amine (B) 1–methyl amino ethane

(C) N–methyl ethanamine (D) N–ethyl methanamine

16. The correct IUPAC name from the incorrect name 4–Amino–3–hydroxy–2–butene is :-

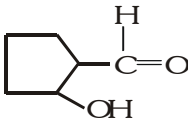
(A) 1–Amino–2–hydroxy–2–butene (B) 4–Amino–2–buten–3–ol

(C) 1–Amino–2–buten–2–ol (D) 1–Amino–2–butenol

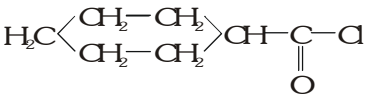
17. The correct name of 2–chlorobutan–3–ol is :-

(A) 3–Chloro–2–hydroxy butane (B) 3–Chloro–2–butanol

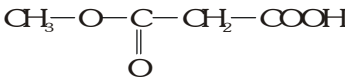
(C) 3–Hydroxy–2–chloro butane (D) 2–Chloro–3–hydroxy butane

18. The correct name for  is :-

(A) 2–Hydroxy cyclopentanal
(B) 2–Formyl–1–hydroxy cyclopentane
(C) 2–Hydroxy cyclopentane carbaldehyde
(D) Cyclopentane–2–ol–1–al

19. The name for the structure 

(A) Cyclo hexanoyl chloride
(B) Cyclohexane carbonyl chloride
(C) 1–Chloro cyclohexanal
(D) Chloro cyclohexyl methanal

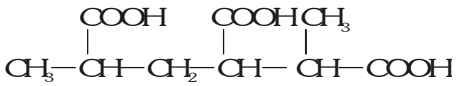
20. 

The correct IUPAC name of the above compound is :

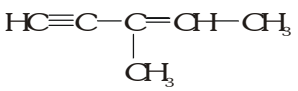
(A) 2–Acetoxy ethanoic acid
(B) 2–Methoxycarbonyl ethanoic acid
(C) 3–Methoxyformyl ethanoic acid
(D) 2–Methoxyformyl acetic acid

CHECK YOUR GRASP				ANSWER KEY						EXERCISE -1					
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	C	B	A	D	A	D	D	C	C	A	B	B	D	B	C
Que.	16	17	18	19	20										
Ans.	C	B	C	B	B										

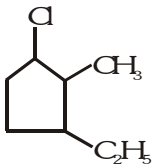
SELECT THE CORRECT ALTERNATIVE (ONLY ONE CORRECT ANSWER)

1. The IUPAC name of  is :-

(A) 2,4,5–Hexane tricarboxylic acid
(B) 2,3,5–Hexane tricarboxylic acid
(C) 2–(1–carboxyethyl)–4–methyl pentanedioic acid
(D) 3,5–Dicarboxy–2–methyl hexanoic acid

2. The name for  is :-

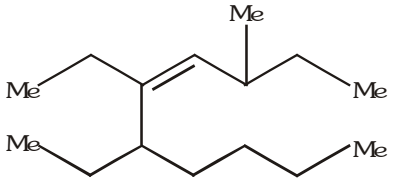
(A) 3–Methyl–2–penten–4–yne
(B) 3–Methyl–3–penten–1–yne
(C) 3–Methyl–4–pentyn–1–ene
(D) 3–Methyl pentenyne

3.  has the IUPAC name as :-

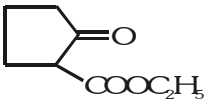
(A) 3–Chloro–1–ethyl–2–methylcyclopentane
(B) 1–Chloro–3–ethyl–2–methylcyclopentane
(C) 4–Chloro–1–ethyl–5–methylcyclopentane
(D) None of above

4. The IUPAC name of CH_3CH_2NHCHO is :

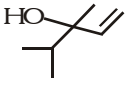
(A) N–formyl ethanamine
(B) Ethyl amino methanal
(C) N–ethyl methanamide
(D) None of them

5. The IUPAC name of the  structure is :-

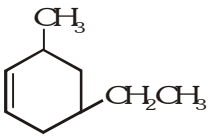
(A) 2,4,5–Triethyl–3–nonene
(B) 5,6–Diethyl–3–methyl–4–decene
(C) 2,4,5–Triethyl–3–octene
(D) 3–Ethyl–5–methyl–3–heptene

6.  has the IUPAC name :

(A) Ethyl–2–oxo cyclopentane carboxylate
(B) 2–Cyclopentanone–1–carbethoxy
(C) 2–Ethylcarbonate cyclopentanone
(D) 1–Keto–2–carbethoxy cyclopentanone

7.  has the IUPAC name :-

(A) 3,4–Dimethyl–1–penten–3–ol
(B) Isopropyl–3–methyl vinyl carbinol
(C) 2,3–Dimethyl–4–penten–3–ol
(D) None of the above

8. The IUPAC name of  is :-

(A) 1–Methyl–5–ethyl cyclohex–2–ene
(B) 5–Ethyl–3–methyl cyclohex–1–ene
(C) 4–Ethyl–6–methyl cyclohex–1–ene
(D) 1–Ethyl–5–methyl cyclohex–3–ene

9. In the compound $HC\equiv C-CH_2-CH=CH-CH_3$, the C_2-C_3 bond is the type of :-

(A) $sp - sp^2$
(B) $sp^3 - sp^3$
(C) $sp - sp^3$
(D) $sp^2 - sp^2$

10. The number of all primary amines possible with the molecular formula C_3H_9N and the primary amine with amino group on a primary carbon atom is given by the set :-

(A) 4 , 1
(B) 2 , 1
(C) 3, 2
(D) 2, 2

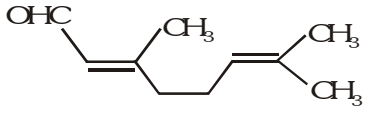
11. The number of primary alkanols, secondary alkanols and tertiary alkanols possible with the formula $C_4H_{10}O$ is given by the set :-

(A) 2, 1, 0
(B) 1, 2, 1
(C) 2, 1, 1
(D) 2, 1, 2

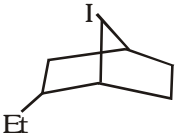
12. IUPAC name of $CH_2 = CH - CH_2NH_2$ is :

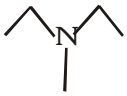
(A) 3-amino propenamine
(B) 2-Propen-1-amine
(C) 3-Amino-1-propenamine
(D) Allyl amine

13. Which name is correct :

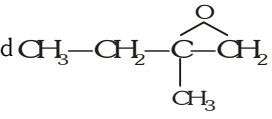
(A) 
3, 7-Dimethyloct-2,6-dienal

(B)  Spiro(3,6) decane

(C) 
3-Ethyl-7-iodobicyclo (2.2.1) heptane

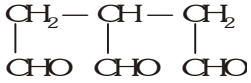
(D)  N-Methyl-N-Ethylethanamine

SELECT THE CORRECT ALTERNATIVES (ONE OR MORE THEN ONE CORRECT ANSWERS)

14. The compound  may be named as :

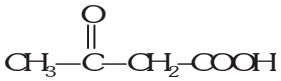
(A) 2-ethyl-2-methyl oxirane
(B) 1, 2-epoxy-2-methylbutane
(C) 1,2-oxapentane
(D) 2-methyl-2-butoxide

15. Which of the following names are not correct for the given compound :



(A) 3-Formyl pentane-1,5-dial
(B) 1,2,3-Triformylpropane
(C) 2-Formylbutane-1,4-dial
(D) Propane-1,2,3-tricarbaldehyde

16. Which of the following names are correct for the compound :



(A) 3-ketobutan-1-oic acid
(B) 4-Carboxy butan -2-one
(C) 3-oxo butan-1-oic acid
(D) 3-Carboxy acetone

17. The compound C_6H_5—CH=CH—COOH may be called as :
(A) Succinic acid
(B) 3-phenylprop-2-en-1-oic acid
(C) Mandelic acid
(D) Cinnamic acid

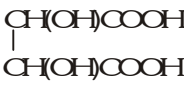
18. Which of the following are the names of cyclic ether :
(A) Oxirane
(B) Epoxyalkane
(C) Alkene oxide
(D) Carbional

19. The name (s) of the following compound is :

$(CH_3)_2CHCN$

(A) 2-Methyl propane nitrile
(B) Isobutyro nitrile
(C) Isopropyl cyanide
(D) None of these

20. The name(s) of the following compound is :



(A) tartaric acid
(B) 2,3-dihydroxy butane-1,4-dioic acid
(C) αα'-dihydroxy succinic acid
(D) None of these

BRAIN TEASERS — ANSWER KEY — EXERCISE -2

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	B	B	B	C	B	A	A	B	C	B	C	B	B	A,B	B,C
Que.	16	17	18	19	20										
Ans.	A,C	B,D	A,B,C	A,B,C	A,B,C										

EXERCISE–03 MISCELLANEOUS TYPE QUESTIONS

MATCH THE COLUMN

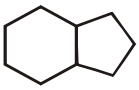
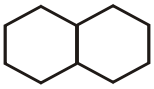
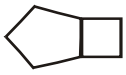
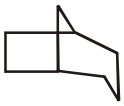
1. Match the following the compounds of column I with column II.

	Column-I		Column-II
(A)	Wood spirit	(p)	2-Butyne
(B)	Acetone	(q)	Trichloromethane
(C)	Dimethyl acetylene	(r)	Methanol
(D)	Chloroform	(s)	Propanone

2. Match the following the compounds of column I with column II.

	Column-I		Column-II
(A)	C_nH_{2n+2}	(p)	Alkynes
(B)	C_nH_{2n}	(q)	Alkenes
(C)	C_nH_{2n-2}	(r)	Cyclohexane
(D)	C_6H_{12}	(s)	Paraffins or alkanes

3. Match column I with column II and select the correct answer from the given codes :

	Column-I (compounds)		Column-II (number of carbons in the bridges)
(A)		(p)	[3.2.1]
(B)		(q)	[4.3.0]
(C)		(r)	[4.4.0]
(D)		(s)	[3.2.0]

COMPREHENSION BASED QUESTIONS :

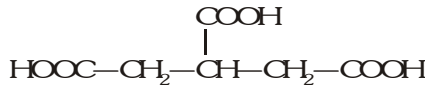
Comprehension # 1

If the organic compond contains more than two similar terminal groups and all of them are directly attached to the principal chain, then none of them forms a part of the principal chain. Special suffixes are used to name these :-

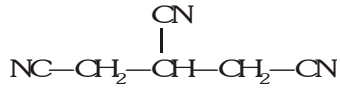
Functional group	Suffix
$--CONH_2$	Carboxamide
$--CN$	Carbonitrile
$--CHO$	Carbaldehyde
$-COOH$	Carboxylic acid

Carbon atoms of these terminal groups are not counted in the principal chain. If any one of these terminal groups is not directly attached to the parent chain and forms the part of side chain, then the longest chain is selected containing two such similar groups at its two ends. The groups present in the side chain are treated as substituents and are indicated by suitable prefixes.

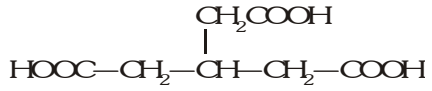
Indicate whether the following IUPAC names are true (a) or false (b)

1.  Propane-1,2,3-tricarboxylic acid

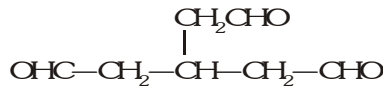
True (a) False (b)

2.  3-cyanopentane-1,5-dinitrile

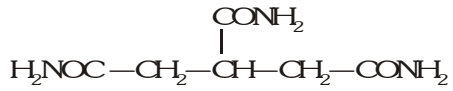
True (a) False (b)

3.  3-(carboxymethyl)-1,5-dioic acid

True (a) False (b)

4.  3-(formylmethyl)pentane-1,5-dial

True (a) False (b)

5.  Propane-1,2,3-tricarboxamide

True (a) False (b)

Comprehension # 2

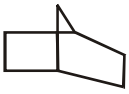
In addition to the standard ring systems (such as cyclohexane), cyclic compounds can also be bicyclic, tricyclic, etc. or they can be spirocyclic, bicyclic or bridge head carbons. The point of attachment of two rings are called bridge head atoms.

The formal names of bicyclic and related ring systems are based on

(a) Total numbe of atoms in the molecule.

(b) The number of atoms in each bridge connecting the bridge head atoms. These numbers are written in square bracket in decreasing order.

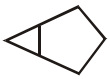
Spirocyclic compounds have two fused rings, but only one bridge head atom. Spirocyclic compounds are named like bicyclic compounds, but have the prefix spirocyclo. Answer the following question :

1. 

what is the IUPAC name of the above compound ?

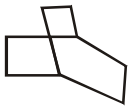
(A) cyclo [1.2.2] heptane (B) Bicyclo [1.2.2] heptane

(C) Bicyclo [2.2.1] heptane (D) cyclo [2.2.1] heptane

2.  The number of atoms in each bridge are :

(A) [3.2.1] (B) [3.1.0] (C) [1.3.0] (D) [2.1.0]

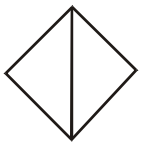
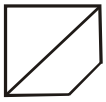
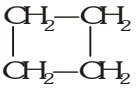
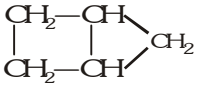
3. Select the correct statements about the following compounds :



(A) It is a tricyclic compound (B) It is bicyclo compound

(C) It is spiro compound (D) Its IUPAC name is bicyclo [2.2.2] hexane

4. Which of the following is the correct structure of bicyclo [1.1.0] butane ?

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

Comprehension # 3

Branched- chain alkanes are named according to the following rules.

(1) Longest chain Rule - Locate the longest continuous chain of carbon atoms. This chain determines the parent name of the alkane.

(2) Lowest set of locants - The longest continuous chain are numbered by arabic numerals 1, 2, 3, 4, ... from one end of chain to the other, in such a manner that carbon atom carrying first substituent gets the lowest number.

(3) Name of the branched chain alkane - The substituent name and the parent alkane are joined in one word and there is a hyphen between the number and the substituent name.

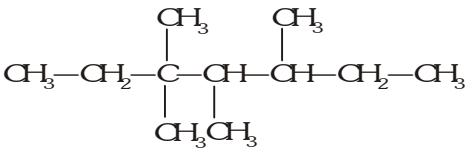
(4) Alphabetical order of the side chains - When two or more substituents are present, give each substituent a number corresponding to its position on the longest chain, the substituent group should be listed alphabetically.

(5) Numbering of different alkyl groups at equivalent positions- If two different alkyl groups are present at equivalent positions the numbering of the parent chain is done in such a way that alkyl group which comes first in the alphabetical order gets the lower number.

(6) Naming of same alkyl groups at different positions - When two or more substituents are identical, indicate this by the use of prefixes di, tri, tetra and soon. Commas are used to separate numbers from each other.

(7) Rule for larger number of substituents - If a compound has two or more chains of the same length, the parent hydrocarbon is the chain with the greater number of substituents.

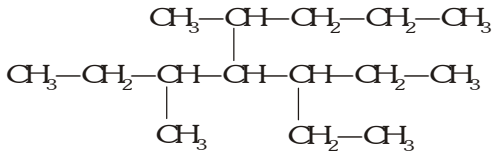
(8) Numbering the complex substituent - Name such as iso-propyl, sec-butyl and tert-butyl are acceptable substituent name in the IUPAC system of nomenclature but systematic name are preferable. Systematic substituent names are obtained by numbering the substituent starting at the carbon that is attached to the parent hydrocarbon. This means that the carbon that is attached to the parent hydrocarbon is always the number –1carbon of the substituent.

1. In following compound 

The correct lowest set of locant is :-

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

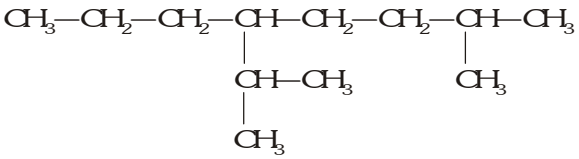
2. The IUPAC name of the compound is ?



(A) 5-Ethyl-3-Methyl-4-(1-Methylpropyl) octane (B) 4-Ethyl-6-Methyl-5-(1-Methylpropyl) octane

(C) 3-Ethyl-5-Methyl-4-(1-Methylpropyl) octane (D) 4-Sec-butyl-5-Ethyl-5-Methylheptane

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



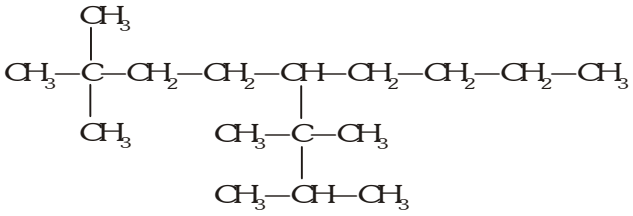
(A) 2-Methyl-5-isopropyloctane (B) 2, 6-Dimethyl-5-propylheptane

(C) 5-isopropyl-2-Methyloctane (D) 4-(1-Methylethyl)-7-methyloctane

4. The molecular weight of following compound is 3, 7 - Diethyl -2, 2-dimethyl-4-propylnonane :-

(A) 230 (B) 236 (C) 254 (D) 240

5. The correct IUPAC name of following compound is -



(A) 2, 3, 3, 7, 7 Pentamethyl-4-butyloctane

(B) 4-Butyl-2, 3, 3, 7, 7 pentamethylnonane

(C) 2, 2-Dimethyl-5-(1', 1', 2'-trimethylpropyl)nonane

(D) 5-(1', 1', 2'-trimethylpropyl)-2, 2-dimethylnonane

MISCELLANEOUS TYPE QUESTION **ANSWER KEY** EXERCISE -3

- ***Match the Column***

  1. A - (r), B - (s), C - (p), D - (q)

  2. A - (s), B - (q, r), C - (p), D - (q, r)

  3. A - (q), B - (r), C - (s), D - (p)

- ***Comprehension Based Questions***

  Comprehension #1 : 1. T **2.** F **3.** F **4.** T **5.** T

  Comprehension #2 : 1. (C) **2.** (B) **3.** (B) **4.** (A)

  Comprehension #3 : 1. (A) **2.** (C) **3.** (A) **4.** (C) **5.** (C)

1. A cartain substances contains only carbon and hydrogen and has a molecular weight of 70. Photochemical chlorination gave only one monochloride. Write the structure and IUPAC name of the hydrocarbon and its monochloride.

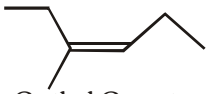
2. A hydrocarbon of molecular weight 72 g mol^{-1} has a 2-methyl group. What is the IUPAC name ? Also drawn its bond-line structure ?

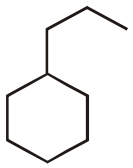
3. Write the structure and give IUPAC systematic name of an alkane or cycloalkane with the formula :

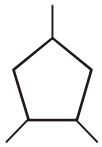
(a) C_8H_{18} that has only primary hydrogen atoms

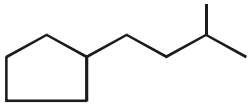
(b) C_6H_{12} that has only secondary hydrogen atoms.

4. What is wrong with the names given for these compounds provide the correct name for each :

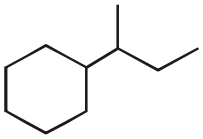
(i) 
2-ethyl-2-pentene

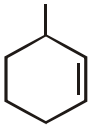
(ii) 
3-cyclohexylpropane

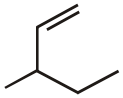
(iii) 
1, 3, 4-trimethylcyclo-pentane

(iv) 
2, 2-methylbutylcyclopentanol

5. Write the IUPAC name for each the following structures :

(a) 

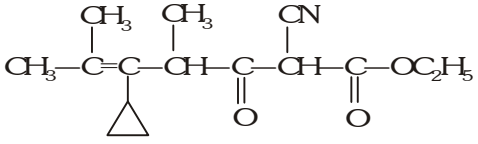
(b) 

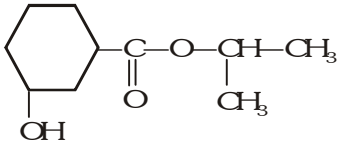
(c) 

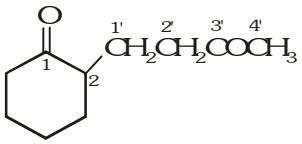
6. Write down the correct priority for citation as principal groups :

 , $-COOH$, $-CHO$, $-OH$, $-Br$, $-$.

7. Write down the correct IUPAC name of the following compounds :

(i) 

(ii) 

(iii) 

8. Write down the structure of the given compounds :

(i) Bicyclo [4.3.1] decane

(ii) 1-(3'-methylcyclopentyl) benzene

(iii) 4-ethyl-2-methyl-1-propylcyclohexane

9. Answer the following :

(i) What would be the molecular formula for a straight chain hydrocarbon having 8 carbon atoms with

(a) all C—C single bond,

(b) Three C—C double bond,

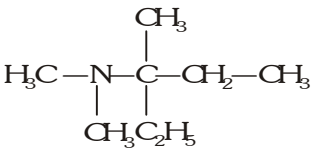
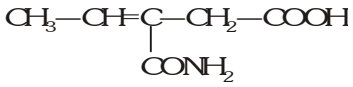
(c) one C—C triple bond and one C—C double bond.

(ii) What is the minimum number of carbon atoms in

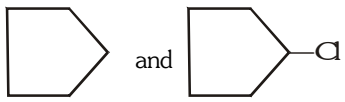
(a) a branched alkane,

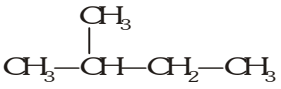
(b) cyclo-alkane

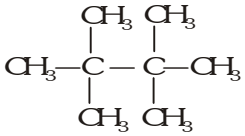
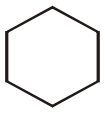
10. Give the IUPAC names of the following compounds :

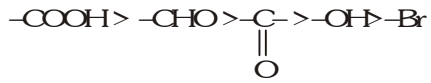
(i)  (ii) $CH_2(COOH)_2$ (iii) 

CONCEPTUAL SUBJECTIVE EXERCISE — ANSWER KEY — EXERCISE -4

1. 

2. 

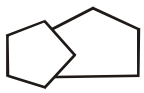
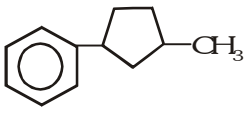
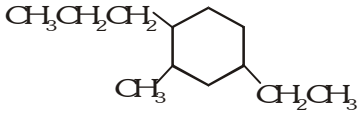
3. (a)  (b) 

6. 

7. (a) Ethyl-2-cyano-5-cyclopropyl-4, 6-dimethyl-3-oxohept-5-en-1-oate

(b) Isopropyl-3-hydroxycyclohexane carboxylate.

(c) 2-(3'-oxobutyl) cyclohexan-1-one.

8. **(i)**  **(ii)**  **(iii)** 

9. **(i)** (a) C_8H_{18} (b) C_8H_{12} (c) C_8H_{12} **(ii)** (a) 4 (b) 3

10. (i) 3-(N, N-dimethylamino) -3-methyl pentane;

(ii) propan-1, 3-dioic acid (iii) 3-Carbamoylpent-3-enoic acid

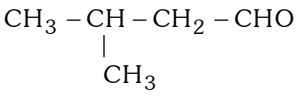
1. Underlined carbon is sp hybridised in- [AIEEE -2002]

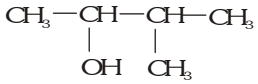
(1) $CH_3\underline{C}H=CH_2$ (2) $CH_3\underline{C}H_2-NH_2$

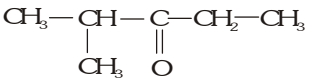
(3) $CH_3\underline{C}ONH_2$ (4) $CH_3CH_2\underline{C}N$

2. Which of the following compound has wrong IUPAC name? [AIEEE -2002]

(1) $CH_3CH_2-CH_2COO-CH_2CH_3$ (Ethyl butanoate)

(2)  (3-Methylbutanal)

(3)  (2-Methyl-3-butanol)

(4)  (2-Methyl-3-pentanone)

3. The IUPAC name of $CH_3COCH(CH_3)_2$ is [AIEEE-2003]

(1) isopropyl methyl ketone

(2) 2-methyl-3-butanone

(3) 4-methylisopropyl ketone

(4) 3-methyl-2-butanone

4. The general formula of $C_nH_{2n}O_2$ could be for open chain [AIEEE-2003]

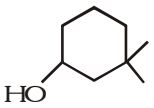
(1) diketones (2) carboxylic acids

(3) diols (4) dialdehydes

5. Which one of the following does not have sp^2 hybridised carbon ? [AIEEE -2004]

(1) Acetone (2) Acetic acid

(3) Acetonitrile (4) Acetamide

6. The IUPAC name of the compound  is [AIEEE-2004]

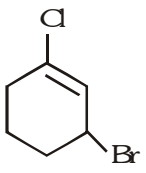
(1) 1, 1-dimethyl-3-cyclohexanol

(2) 1, 1-dimethyl-3-hydroxy cyclohexane

(3) 3, 3-dimethyl-1-cyclohexanol

(4) 3, 3-dimethyl-1-hydroxy cyclohexane

7. The IUPAC name of the compound is



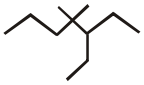
[AIEEE-2006]

(1) 6-bromo-2-chlorocyclohexene

(2) 3-bromo-1-chlorocyclohexene

(3) 1-bromo-3-chlorocyclohexene

(4) 2-bromo-6-chlorocyclohex-1-en

8. The IUPAC name of  is- [AIEEE-2007]

(1) 1, 1-diethyl-2, 2-dimethylpentane

(2) 4, 4-dimethyl-5, 5-diethylpentane

(3) 5, 5-diethyl-4, 4-dimethylpentane

(4) 3-ethyl-4, 4-dimethylheptane

9. The correct decreasing order of priority for the functional groups of organic compounds in the IUPAC system of nomenclature is [AIEEE -2008]

(1) –COOH, – SO_3H, $–CONH_2$, –CHO

(2) $–SO_3H$, –COOH, $–CONH_2$, – CHO

(3) –CHO, – COOH, $–SO_3H$, $–CONH_2$

(4) $–CONH_2$, –CHO, $–SO_3H$, –COOH

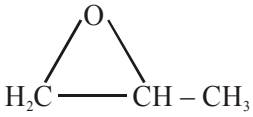
10. The IUPAC name of neopentane is :-

(1) 2–methylpropane [AIEEE -2009]

(2) 2, 2–dimethylbutane

(3) 2–methylbutane

(4) 2, 2–dimethylpropane

11. The IUPAC name of the compound  is :- [AIEEE-2012 (Online)]

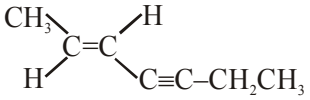
(1) 1, 2-Epoxy propane

(2) Propylene oxide

(3) 1, 2–Oxo propane

(4) 1, 2–Propoxide

12. The IUPAC name of the following compounds is : [AIEEE-2012 (Online)]



(1) (Z) – 5 – hepten – 3 – yne

(2) (Z) – 2 – hepten – 4 – yne

(3) (E) – 5 – hepten – 3 – yne

(4) (E) – 2 – hepten – 4 – yne

PREVIOUS YEAR QUESTIONS ANSWER KEY EXERCISE-05(A)

Que.	1	2	3	4	5	6	7	8	9	10	11	12
Ans	4	3	4	2	3	3	2	4	1	4	1	4

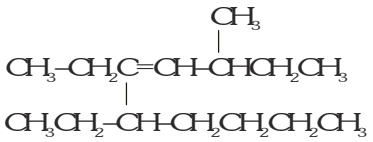
EXERCISE–05(B) PREVIOUS YEARS QUESTIONS

1. The IUPAC name of the compound, $CH_2=CH—CH(CH_3)_2$ is - **[IIT-88]**

(A) 1,1-Dimethylprop-2-ene (B) 3-Methylbut-1-ene

(C) 2-Vinylpropane (D) 1-Isopropylethylene

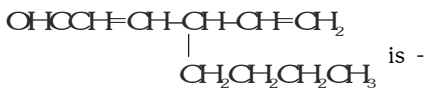
2. The correct IUPAC name of the compound is : **[IIT-90]**



(A) 5,6–diethyl–8–methyl dec–6–ene (B) 5,6–diethyl–3–methyl dec–4–ene

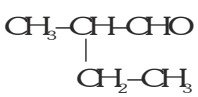
(C) 6–butyl–5–ethyl–3–methyl oct–4–ene (D) 2,4,5–triethyl–3–ene

3. The IUPAC name of - **[IIT-91]**

 is -

(A) 5–Vinyloct–3–en–1–al (B) 4–Butylhexa–2,5–dien–1–al

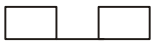
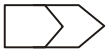
(C) 5–Vinyloct–5–en–8–al (D) 3–Butylhexa–1,4–dien–8–al

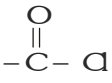
4. Choose the correct IUPAC name for  is - **[IIT-93]**

(A) Butan–2–aldehyde (B) 2–Methylbutanal

(C) 3–Methyl iso butyraldehyde (D) 2–Ethylpropanal

5. A compound with molecular formula C_8H_{14}, contains 12 secondary and two tertiary H atoms. The compound is : **[IIT-93]**

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

6. IUPAC name of  **[IIT-06]**

(A) Benzoylchloride (B) Benzenecarbonylchloride

(C) Chlorophenyl ketone (D) Phenylchloroketone

PREVIOUS YEARS QUESTIONS	ANSWER KEY	EXERCISE -5 (B)

• **1.** B **2.** B **3.** B **4.** B **5.** B,C,D **6.** B