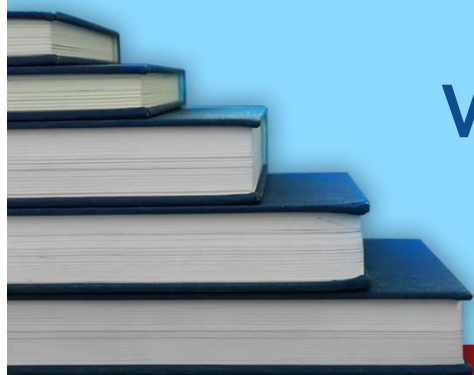


CHEMISTRY



WORKSHEET-1



STOP

A PROJECT BY PUNJAB GROUP

Q.15 When hydrogen is removed from alkane, the product obtained has the general formula:

- A) C_nH_{2n+2} C) C_nH_{2n+1}
 B) C_nH_{2n-2} D) C_nH_{2n-1}

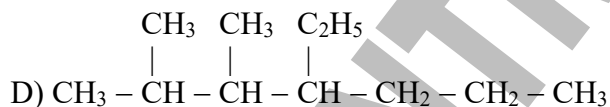
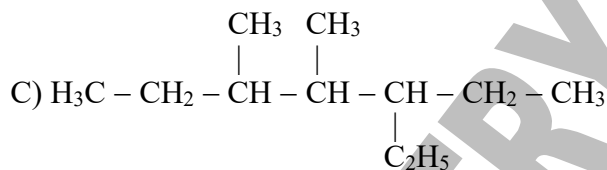
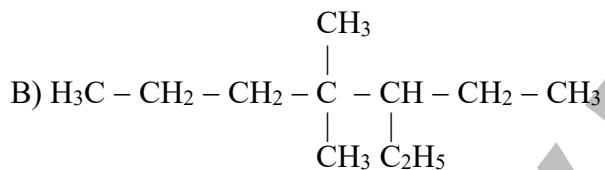
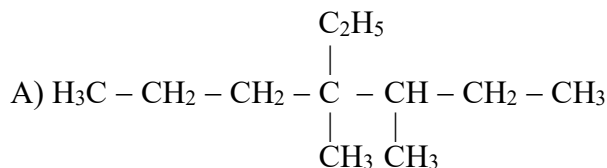
Q.16 Consider the following condensed formula of alkane:



Correct name of above formula according to IUPAC is:

- A) 2,3,4-Trimethylpentane C) 2,4,4-Trimethylpentane
 B) 2,6,6-Trimethylpentane D) 2,2,4-Trimethylpentane

Q.17 The structural formula of the following given compound 4-Ethyl-3,4-dimethylheptane is:



Q.18 Organic compounds that show weak attractive forces have:

- A) High boiling points C) Low melting points
 B) High melting points D) Low vapour pressure

Q.19 When organic compounds contain more than one functional group, it is known as:

- A) Derivatives C) Poly-functional
 B) Heterocyclic D) Isomers

Q.20 The correct name according to IUPAC of the following alkene is:



- A) 1,3-Pentadiene C) 2,3-Pentadiene
 B) 2,4-Pentadiene D) 1,4-Pentadiene

USE THIS SPACE FOR
SCRATCH WORK

Q.38 Which of the statements is false regarding chiral compounds?

- A) Rotate the plane of polarized light
- B) Have cis and trans isomers
- C) Exist as enantiomers
- D) Can be detected with a polarimeter

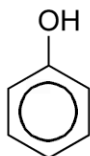
STEP ENTRY TEST 2021

ANSWER KEY (Worksheet-1)

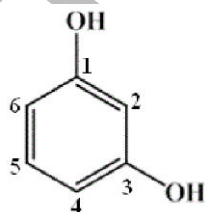
1	A	11	D	21	A	31	C
2	C	12	A	22	C	32	D
3	A	13	B	23	A	33	A
4	D	14	A	24	B	34	A
5	B	15	C	25	B	35	A
6	C	16	D	26	B	36	D
7	C	17	A	27	C	37	C
8	B	18	C	28	A	38	A
9	B	19	C	29	B		
10	D	20	A	30	D		

ANSWERS EXPLAINED

- Q.1 (A)** Aniline is an aromatic compound. While B and C are alicyclic, while D is branched aliphatic organic compound.
- Q.2 (C)** Organic compounds do not show the property of polymorphism and isomorphism. They show the property of isomerism.
- Q.3 (A)** $C_{10}H_{22}$ is a non-polar organic compound. In fact, it is an example of an alkane. Its name is decane.
- Q.4 (D)** Phenol is not a heterocyclic compound. It is an aromatic compound and its structural formula is:

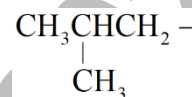


- Q.5 (B)** Resorcinol is not a heterocyclic compound. It is an organic compound with the formula $C_6H_4(OH)_2$. It is one of three isomeric benzenediols, the 1,3-isomer (or meta-isomer). It is a white, water-soluble solid.



- Q.6 (C)** The main reason for such a large number of compounds is its unique property of linking with other carbon atoms to form long chains or rings. This self-linking property of carbon is called catenation.

- Q.7 (C)** The structure of isobutyl alkyl radical.



- Q.8 (B)** Alkanes are the simplest and least reactive hydrocarbon species containing only carbons and hydrogens.

- Q.9 (B)** Since **trans-isomers** of **geometric isomerism** is **symmetrical** molecule. It has **low** boiling point and **high** melting point.

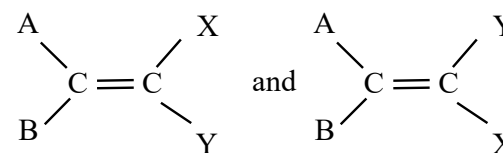
- Q.10 (D)** **1-Butene** does not fulfill the conditions of **geometric isomerism**. Though it has a carbon-carbon double bond ($C=C$) but different groups are **not** attached with carbon containing double bond, as shown in the structure $CH_2=CH-CH_2-CH_3$.

- Q.11 (D)** **Basic conditions for geometric isomerism** are such as:

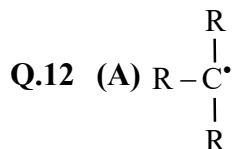
- Having Carbon-Carbon double bond
- Different groups are attached with carbon containing double bond

Memorize: The presence of a double bond is **not** the only condition for geometrical isomerism. Each double-bonded carbon atom must have two **different groups** attached to it.

e.g.

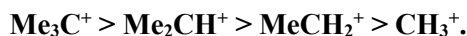


are geometrical isomers only if $A \neq B$ and $X \neq Y$. A can be the same as X and Y, and B can be the same as X or Y.

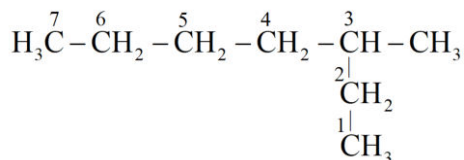


is the most stable free radical while others B, C, and D are not.

Q.13 (B) CH_3^+ (methyl carbocation) is the least stable because of less number of alkyl groups (i.e. electron donating) are attached with it. Order of stability of carbocations is



Q.14 (A) The correct name of alkane according to IUPAC is 3-Methylheptane.

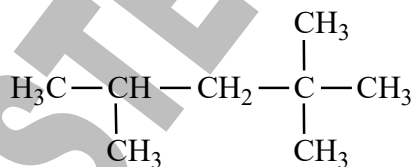


Q.15 (C) Alkanes can be described by the general formula $\text{C}_n\text{H}_{2n+2}$. An alkyl group is formed by removing one hydrogen from the alkane chain and is described by the formula $\text{C}_n\text{H}_{2n+1}$.

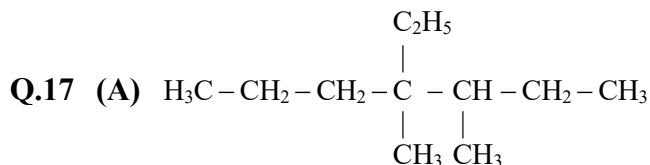
Q.16 (D) 2,2,4-Trimethylpentane is the correct name according to IUPAC of given condensed formula



- Its structural formula is:



(Isooctane)



is the structural formula of 4-Ethyl-3,4-dimethylheptane.

Q.18 (C) Organic compounds that show weak attractive forces have low melting points.

Q.19 (C) When organic compounds contain more than one functional group, it is known as poly-functional.

Q.20 (A) 1,3-Pentadiene is the correct name according to IUPAC of given structural formula



Q.21 (A) $-\text{COOH}$ is a functional group of carboxylic acid.

Q.22 (C) Mercapto (SH $-$) is a functional group of thioalcohol.

Q.23 (A) The type of isomerism which arises due to shifting of proton from one atom to other in the same molecule is called tautomerism.

Q.24 (B) The compounds in which the ring consists of atoms of more than one kind are called heterocyclic compound or heterocycles. In heterocyclic compounds generally one or more atoms of elements such as N, O or S which are known as hetero atoms. e.g. Pyridine, Furan, Pyrrole and Thiophene are heterocyclic compounds.

Q.25 (B) The type of structural isomerism which arises due to the unequal distribution of carbon atoms on either side of the functional group is called metamerism.

Q.26 (B) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{OH}$ (1-propanol) and $\text{CH}_3-\text{CH}(\text{OH})\text{CH}_3$ (2-propanol) show position isomerism.

Q.27 (C) Optical isomers are two compounds which contain the same number and kinds of atoms, and bonds (i.e., the connectivity between atoms is the same), and different spatial arrangements of the atoms, but which have non-superimposable mirror images. Each non-superimposable mirror image structure is called an enantiomer. All α -amino acids show optical isomerism except glycine.

Q.28 (A) The major portion of natural gas is methane.

Q.29 (B) Organic compounds are mostly covalent in nature and forms covalent bonds.

Q.30 (D) Functional group of ester is $-\text{COOR}$.

Q.31 (C) Organic compounds are divided in two major classes on the basis of functional group.

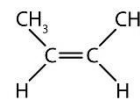
1. Hydrocarbons

2. Derivatives of hydrocarbons

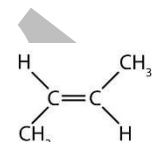
Q.32 (D) 1-Pentene does not exist in the form of cis and trans isomers because it does not fulfill the condition of geometric isomerism.

Other (1-Butene, 2-Pentene and 1-Bromo-2-chloropropene) show cis and trans isomers as shown below:

2-Butene:

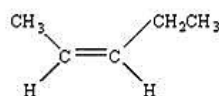


cis-2-butene

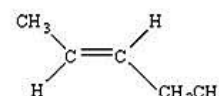


trans-2-butene

2-Pentene:

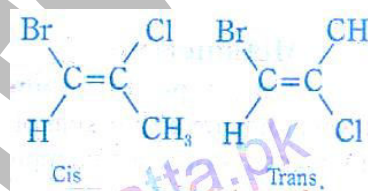


cis-2-pentene



trans-2-pentene

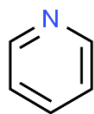
1-Bromo-2-chloropropene



Q.33 (A)

Opt.	Class of Compounds	Functional Group	Name of Functional Group	General Formula
A)	Ether	$-\text{O}-$	Oxygen	$(\text{C}_n \text{H}_{2n+1})_2 \text{O}$
B)	Ketone	$-\text{CO}-$	Keto group	$(\text{C}_n + \text{H}_{2n+1})_2 \text{CO}$
C)	Aldehyde	$-\text{CHO}$	Formyl	$\text{C}_2 \text{H}_{2n+1} \text{CHO}$
D)	Ester	$-\text{COOR}$	Ester	$(\text{C}_n \text{H}_{2n+1} \text{COOC}_n \text{H}_{2n+1})$

Q.34 (A) Pyridine belongs to heterocyclic class of organic compounds.

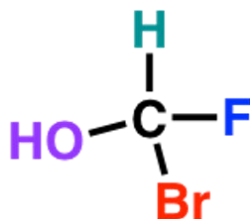


Pyridine

Q.35 (A) Ethanol and dimethyl ether are best considered structural isomers.

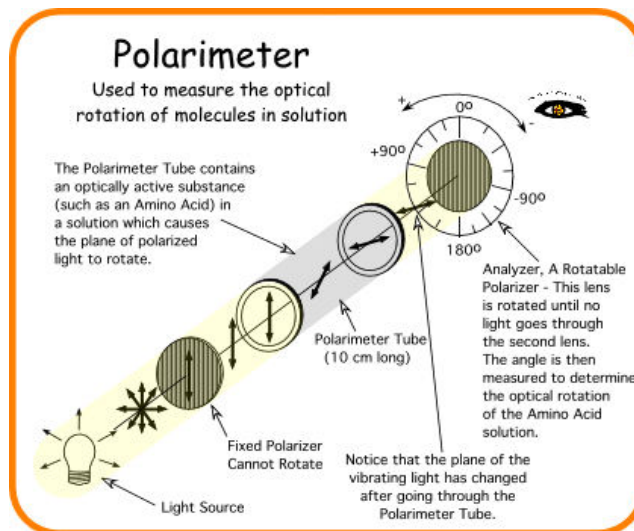
Q.36 (D) Alkanes show geometrical isomers due to restricted rotation around a double bond.

Q.37 (C) An asymmetric carbon atom (chiral carbon) is a carbon atom that is attached to four different types of atoms or groups of atoms. Molecules that cannot be superimposed on their own mirror image are said to be chiral like mirror image.



For example asymmetric carbon atom it can rotate plane polarized light either to the left (laevorotatory) or to the right dextrorotatory.

Q.38 (A) Chiral compound can rotate the plane polarized light.



STOP

A PROGRAM BY PUNJAB GROUP

