Frequently Asked Questions (FAQs)

Q1. What are alcohols?

Ans. Acohol are the organic compounds characterized by one or more hydroxyl (−OH) groups attached to a carbon atom of an alkyl group (hydrocarbon chain). Alcohols may be considered as organic derivatives of water (H_2O) in which one of the hydrogen atoms has been replaced by an alkyl group, typically represented by R in organic structures. For example, in ethanol (or ethyl alcohol) the alkyl group is the ethyl group, $-CH_2CH_3$.

Q2. Name different types of alcohols?

Ans. Alcohols fall into different classes depending on how the OH group is positioned on the chain of carbon atoms. There are some chemical differences between the various types.

Primary alcohols

In a primary (1°) alcohol, the carbon which carries the OH group is only attached to one alkyl group. Example: Ethanol, propan-1-ol, 2-methylpropan-1-ol.

There is an exception to this. Methanol, CH3OH, is counted as a primary alcohol even though there are *no* alkyl groups attached to the carbon with the OH group on it.

Secondary alcohols

In a secondary (2°) alcohol, the carbon with the OH group attached is joined directly to *two* alkyl groups, which may be the same or different. Examples: Propane-2-ol, butan-2-ol, pentan-3-ol.

Tertiary alcohols

In a tertiary (3°) alcohol, the carbon atom holding the OH group is attached directly to *three* alkyl groups, which may be any combination of same or different. Examples: 2-methylpropan-2-ol, 2-methylbutan-2-ol.

Q3. Define briefly ethanol fermentation?

Ans. Ethanol fermentation, also called alcoholic fermentation, is a biological process which converts sugars such as glucose, fructose, and sucrose into cellular energy, producing ethanol and carbon dioxide as a side-effect. Because yeasts perform this conversion

in the absence of oxygen, alcoholic fermentation is considered an anaerobic process.

Q4. What is meant by wine aging?

Ans. Odors in the wine that came directly from the grapes are called wine aroma. Bouquet is the term used for the odors in the wine produced by the winemaking process, and winemakers use the term "nose" when referring to both the aroma and the bouquet components.

Q5. How is beer prepared?

Ans. Beer is made by the yeast fermentation of grains to ethanol and carbon dioxide. There are five major steps in the manufacture of *beer* or *ale* from grain. These are *malting, mashing, 'fermenting, maturing,* and *finishing. Malting* and *mashing* are concerned with the conversion of starch into fermentable form such as maltose or glucose. The chief raw material is *malt,* which is germinated barley that has been dried and ground. It contains stanch, proteins, and high concentration of amylases and proteinases. Amylases convert the starch into fermentable sugar. Mould amylase derived from *Aspergillus oryzae* is sometimes used for the same purpose. Ground malt is mashed in warm water to bring about the digestion of starch and proteins. The aqueous extract contains dextrins, maltose, and other sugars, protein breakdown products, minerals and various growth factors. This is a rich nutrient medium and is called *beer wort.* The beer wort is filtered and *hops* are added, *Hops* are the flowers of *Humulus lupulus.* They are added for flavour, colour, aroma and for mild antibacterial activity to prevent the growth of spoilage bacteria.

Q6. Name the two main processes for production of ethanol from corn and give main difference between them?

Ans. The two main processes for producing ethanol from corn are, **dry-milling** and **wet-milling**. Both processes involve breaking down the starch in the corn kernel into simple sugars and then fermenting the sugars to create ethanol. The primary difference between the two methods is whether the entire kernel is processed, as in corn dry-milling; or if the corn kernel is first broken down into its individual components (i.e., germ, fiber, gluten, and starch) prior to processing, as in corn wet-milling.

Q7. How is Isopropyl alcohol produced in indirect hydration?

Ans. In indirect hydration process the propene reacts with sulfuric acid to form a mixture of sulfate esters. Subsequent hydrolysis of these esters by steam produces isopropyl alcohol, which is distilled. Di-isopropyl ether is a significant by-product of this process; it is recycled back to the process and hydrolyzed to give the desired product.

Q8. Give a brief account of methanol production from biomass?

Ans. The conventional method to produce methanol from biomass is through gasification of the feedstock material. The gasification process of biomass is similar to the synthesis gas process from coal. For gasification of biomass the feedstock is first dried and pulverized. The moist content should generally be no higher than 15-20 wt%. The first step in a two-step gasification process is called pyrolysis, or destructive distillation. The dried biomass is heated to 400-600 °C in an oxygen deficient environment to prevent complete combustion. Carbon monoxide, carbon dioxide, hydrogen, methane as well as water and volatile tars are released. The remaining biomass (≈10–25 wt%),called charcoal. is further reacted with oxygen at high temperature (1300-1500 °C) to produce mainly carbon monoxide. The synthesis gas produced from the pyrolysis and charcoal conversion is purified before the methanol synthesis.

Q9. What are the two main uses of Ethylene glycol?

Ans. Ethylene glycol (ethane-1, 2-diol) is an organic compound with the formula $(CH_2OH)_2$. It is mainly used for two purposes, as a raw material in the manufacture of polyester fibers and for antifreeze formulations. It is an odorless, colorless, sweet-tasting syrup. Ethylene glycol is moderately toxic.

Q10. Define term lautering?

Ans. Lautering is the separation of the extracts won during mashing from the spent grain. It is achieved in either a lauter tun, a wide vessel with a false bottom, or a mash filter, a plate-and-frame filter designed for this kind of separation. Lautering has two stages: first wort run-off, during which the extract is separated in an undiluted state from the spent grains, and sparging, in which extract which remains with the grains is rinsed off with hot water.

Q11. How does alcohol affect a person?

Ans. Alcohol affects every organ in the body. It is a central nervous system depressant that

is rapidly absorbed from the stomach and small intestine into the bloodstream. Alcohol is metabolized in the liver by enzymes; however, the liver can only metabolize a small amount of alcohol at a time, leaving the excess alcohol to circulate throughout the body. The intensity of the effect of alcohol on the body is directly related to the amount consumed.

Q11. Why do some people react differently to alcohol than others?

Ans. Individual reactions to alcohol vary, and are influenced by many factors; such as:

- Age
- Gender
- Race or ethnicity
- Physical condition (weight, fitness level, etc)
- Amount of food consumed before drinking
- How quickly the alcohol was consumed
- Use of drugs or prescription medicines
- Family history of alcohol problems

Q12. What are caffeinated alcoholic beverages (CABs)?

Ans. Caffeinated alcoholic beverages (CABs) are premixed beverages that combine alcohol, caffeine, and other stimulants. They may be malt- or distilled spirits-based and usually have higher alcohol content than beer (e.g., 5%–12% on average for CABs compared to 4%–5% for beer). The caffeine content in these beverages is usually not reported.

Q13. What is a spot test for alcohol?

Ans. The classic test for alcohols uses chromic anhydride (CrO_3) in sulfuric acid solution. Within seconds after contacting a sample containing alcohol, the solution turns from clear orange to cloudy blue-green. Be careful- chromic anhydride in acid is extremely corrosive, poisonous, and carcinogenic.

Q14. What do you mean by the term *Must*?

Ans. The grapes that are used for wine making are crushed carefully and the juice is collected. To the raw juice collected is termed as *must;* sulphur dioxide is added as sodium meta-bisulphite. The *must* is then inoculated with a starter culture-of a selected strain *of S. cerevisiae var. elliposideus.*

Q15. How is white wine made?

Ans. White wine is made by a different process. First the grapes are crushed and pressed immediately to separate the juice from the solids. After pressing, the skins, stems and seeds are discarded, and the juice is cooled to a low temperature. Then the cold juice is allowed to settle for several hours, and the clear juice is decanted off the residue before it is fermented. White wine is made by fermenting this clarified juice.