

CUET PG 2026 Food Science Question Paper with Solutions

Time Allowed :1 Hour 30 Minutes	Maximum Marks :300	Total Questions :75
---------------------------------	--------------------	---------------------

General Instructions

Read the following instructions very carefully and strictly follow them:

- The Question Paper consists of 75 Multiple Choice Questions (MCQs).
- Total marks for the exam is 300.
- The total duration is 90 minutes; a timer on the screen will display the remaining time, and the exam will automatically submit when the time reaches zero.
- For every correct answer, 4 marks (+4) will be awarded to the candidate, and a 1 mark (-1) will be deducted for every incorrect answer.
- Question papers are available in both English and Hindi.

1. What is the primary protein found in wheat responsible for its dough-forming properties?

- (A) Casein
- (B) Albumin
- (C) Gluten
- (D) Keratin

Correct Answer: (C) Gluten

Solution:

The structure and texture of baked goods like bread are largely determined by the proteins present in the flour. When wheat flour is mixed with water, specific proteins interact to form a unique network that gives dough its characteristic properties.

Step 1: Understanding the Question:

The question asks to identify the specific protein in wheat that is essential for forming dough.

Step 2: Detailed Explanation:

Let's analyze the options provided:

- **(A) Casein:** This is the main protein found in milk and is responsible for the formation of cheese curd.
- **(B) Albumin:** This is a type of protein found in egg whites (ovalbumin) and blood serum. While used in some food applications, it is not the primary dough-forming protein in wheat.

- **(C) Gluten:** This is a protein complex formed when two native wheat proteins, gliadin and glutenin, are hydrated and mixed. This network provides the elasticity (ability to spring back) and extensibility (ability to be stretched) that are crucial for dough structure and its ability to trap gas during fermentation.
- **(D) Keratin:** This is a fibrous structural protein found in hair, feathers, horns, claws, and hooves of animals. It is not found in wheat and is not edible.

Based on this analysis, gluten is the protein directly responsible for the viscoelastic properties of wheat dough.

Step 3: Final Answer:

The primary protein in wheat that gives dough its structure is gluten.

💡 Quick Tip

Remember that gluten is not a single protein but a complex formed from gliadin and glutenin. Gliadin provides extensibility (stretchiness), while glutenin provides elasticity (strength). This combination is key to a good loaf of bread.

2. Which enzyme is commonly used as an indicator for the effectiveness of milk pasteurisation?

- (A) Amylase
- (B) Lipase
- (C) Phosphatase
- (D) Protease

Correct Answer: (C) Phosphatase

Solution:

Pasteurisation is a critical heat treatment process in the dairy industry to ensure milk safety by destroying harmful pathogens. To verify that the process has been carried out correctly, a naturally occurring enzyme in milk is tested for its activity. This enzyme acts as an indicator.

Step 1: Understanding the Question:

The question asks to identify the specific enzyme whose presence or absence is used to confirm that milk has been properly pasteurised.

Step 2: Detailed Explanation:

An ideal indicator enzyme for pasteurisation must have a thermal resistance slightly greater than that of the most heat-resistant pathogens found in milk (like *Coxiella burnetii*). This ensures that if the enzyme is destroyed, the pathogens have also been destroyed. Let's examine the options:

- **(A) Amylase:** An enzyme that breaks down starch, not typically used as a pasteurisation indicator.
- **(B) Lipase:** An enzyme that breaks down fats. Its activity can cause rancidity, but it is not the primary indicator for pasteurisation effectiveness.
- **(C) Phosphatase (specifically, Alkaline Phosphatase - ALP):** This enzyme is naturally present in raw milk and is destroyed at the temperature-time combinations used for pasteurisation (e.g., 72°C for 15 seconds). Its heat resistance is slightly higher than that of common pathogens. Therefore, a negative test for ALP activity post-pasteurisation confirms that the treatment was successful.
- **(D) Protease:** An enzyme that breaks down proteins. Some proteases are very heat-stable and would survive pasteurisation, making them unsuitable indicators.

The absence of alkaline phosphatase is the standard industry test for adequate pasteurisation.

Step 3: Final Answer:

Phosphatase is the enzyme used as an indicator for the effectiveness of milk pasteurisation.

💡 Quick Tip

A positive phosphatase test is a red flag. It indicates either under-processing (the milk was not heated enough) or post-pasteurisation contamination with raw milk. This is a critical quality control check.

3. In food preservation, what does the term 'D-value' represent?

- (A) Time required to destroy all microorganisms
- (B) Time required to reduce microbial population by 90%
- (C) Temperature required to kill microorganisms
- (D) Rate of microbial growth

Correct Answer: (B) Time required to reduce microbial population by 90%

Solution:

In thermal processing of food, it is essential to quantify the effectiveness of a heat treatment in destroying microorganisms. The D-value is a standard parameter used in food microbiology and processing for this purpose.

Step 1: Understanding the Question:

The question asks for the correct definition of the 'D-value' in the context of food preservation.

Step 2: Detailed Explanation:

The term 'D-value' stands for 'Decimal Reduction Time'. It is defined as the time required at a specific temperature to destroy 90% of a target microbial population. A 90% reduction corresponds to a one-log cycle reduction (i.e., reducing the population by a factor of 10).

Let's analyze the options:

- **(A) Time required to destroy all microorganisms:** This is practically impossible to achieve and define, as microbial death is logarithmic. The concept of commercial sterility is used instead.
- **(B) Time required to reduce microbial population by 90%:** This is the precise definition of the D-value.
- **(C) Temperature required to kill microorganisms:** This refers to concepts like the thermal death point, not the D-value, which is a measure of time at a constant temperature.
- **(D) Rate of microbial growth:** The D-value measures the rate of microbial death or inactivation, not growth.

Step 3: Final Answer:

The D-value represents the time required to reduce the microbial population by 90%.

💡 Quick Tip

The D-value is specific to a particular microorganism at a specific temperature. A more heat-resistant organism will have a higher D-value, meaning it takes longer to kill it at that temperature.

4. Which food additive is used as a sequestering agent to prevent oxidative rancidity?

- (A) Sodium benzoate
- (B) EDTA
- (C) Citric acid
- (D) Sodium chloride

Correct Answer: (B) EDTA

Solution:

Oxidative rancidity is a major cause of food spoilage, particularly in products containing fats and oils. This process is often catalyzed by the presence of metal ions (like iron and copper). Sequestering agents are used to counteract this effect.

Step 1: Understanding the Question:

The question asks to identify an additive that acts as a sequestering agent, which means it binds to metal ions to prevent them from accelerating oxidation.

Step 2: Detailed Explanation:

A sequestering agent, or chelating agent, forms stable complexes with metal ions, effectively removing them from the reaction system. Let's examine the options:

- **(A) Sodium benzoate:** This is primarily an antimicrobial agent, effective against yeasts and molds in acidic foods.
- **(B) EDTA (Ethylenediaminetetraacetic acid):** This is a powerful and widely used chelating agent. Its molecular structure allows it to wrap around and bind tightly to metal ions, making them chemically inert and unable to catalyze oxidative reactions.
- **(C) Citric acid:** While citric acid does have some mild chelating properties, its primary role in food is as an acidulant (to provide tartness) and a pH control agent. EDTA is significantly more effective as a sequesterant.
- **(D) Sodium chloride:** This is common salt, used for flavoring and as a preservative (by lowering water activity), but it is not a sequestering agent.

Therefore, EDTA is the most appropriate answer as a strong sequestering agent.

Step 3: Final Answer:

EDTA is the food additive used as a sequestering agent to prevent oxidative rancidity.

💡 Quick Tip

Sequestering agents are often called 'antioxidant synergists'. They don't stop oxidation themselves but enhance the effectiveness of primary antioxidants (like BHA, BHT) by removing the metal ions that would otherwise accelerate the process.

5. What is the name of the process used to destroy pathogenic microorganisms in liquid foods using high heat for a short time?

- (A) Sterilisation
- (B) Pasteurisation
- (C) Fermentation
- (D) Dehydration

Correct Answer: (B) Pasteurisation

Solution:

Thermal processing is a common method for preserving liquid foods like milk and juice. The intensity of the heat treatment is chosen based on the desired shelf life and the need to preserve the food's sensory and nutritional qualities.

Step 1: Understanding the Question:

The question describes a specific thermal process: using high heat for a short time, with the goal of destroying pathogenic (disease-causing) microorganisms, not all microorganisms.

Step 2: Detailed Explanation:

Let's differentiate between the given processes:

- **(A) Sterilisation:** This is a very severe heat treatment (e.g., UHT - Ultra High Temperature) designed to destroy all microorganisms, including heat-resistant bacterial spores. This results in a commercially sterile product with a long shelf life at room temperature.
- **(B) Pasteurisation:** This is a milder heat treatment designed to kill pathogens and reduce the number of spoilage organisms. It does not eliminate all microbes, especially spores. The description "high heat for a short time" perfectly matches High-Temperature Short-Time (HTST) pasteurisation (e.g., 72°C for 15 seconds for milk). The primary goal is safety while minimizing quality damage.
- **(C) Fermentation:** This is a biochemical process that uses microorganisms to transform food, not a heat process to kill them.
- **(D) Dehydration:** This is a preservation method that involves removing water, not applying heat to kill microbes directly.

The key distinction is that pasteurisation targets pathogens, while sterilisation targets all life forms. The question specifies destroying pathogens, making pasteurisation the correct answer.

Step 3: Final Answer:

The process described is Pasteurisation.

💡 Quick Tip

A key takeaway is that pasteurisation makes food safe to consume but does not make it sterile. This is why pasteurised milk and juices still require refrigeration to slow the growth of the remaining spoilage microorganisms.

6. Which vitamin is most susceptible to loss during the boiling of vegetables?

- (A) Vitamin A
- (B) Vitamin D
- (C) Vitamin C
- (D) Vitamin K

Correct Answer: (C) Vitamin C

Solution:

The nutrient content of food can be significantly altered during cooking. The stability of a vitamin depends on several factors, including its solubility (in water or fat) and its sensitivity to heat, light, and oxygen.

Step 1: Understanding the Question:

The question asks to identify the vitamin that is most easily lost when vegetables are boiled.

Step 2: Detailed Explanation:

Vitamins are broadly classified into two groups:

- **Fat-soluble vitamins:** A, D, E, K. These vitamins are not soluble in water and are relatively stable to heat. Therefore, they are not easily lost by leaching into boiling water.
- **Water-soluble vitamins:** B-complex vitamins and Vitamin C. These vitamins can dissolve into the cooking water.

Let's analyze the given options based on this:

- Vitamins (A), (B), and (D) are all fat-soluble and relatively heat-stable. Loss during boiling would be minimal.
- Vitamin C (ascorbic acid) is not only water-soluble but also extremely sensitive to heat and oxidation. During boiling, it suffers from a double effect: it leaches out into the surrounding water and is also destroyed by the high temperature. This combination makes it the most susceptible to loss among the choices.

Step 3: Final Answer:

Vitamin C is the most susceptible to loss during the boiling of vegetables.

 Quick Tip

To preserve Vitamin C and other water-soluble vitamins, use cooking methods that minimize water and cooking time. Steaming, microwaving, or stir-frying are better alternatives to boiling for retaining nutrients in vegetables.

7. What is the major acid present in citrus fruits like lemons and oranges?

- (A) Acetic acid
- (B) Lactic acid
- (C) Citric acid
- (D) Tartaric acid

Correct Answer: (C) Citric acid

Solution:

Organic acids are naturally occurring compounds in fruits and vegetables that contribute significantly to their flavor, particularly their tartness or sourness. Different fruits are characterized by the predominance of specific organic acids.

Step 1: Understanding the Question:

The question asks to identify the main organic acid responsible for the characteristic taste of citrus fruits.

Step 2: Detailed Explanation:

Let's identify the primary source for each of the acids listed:

- **(A) Acetic acid:** This is the acid that gives vinegar its sour taste and pungent smell.
- **(B) Lactic acid:** This acid is produced by bacterial fermentation and is characteristic of sour milk products like yogurt and kefir, as well as pickled vegetables.
- **(C) Citric acid:** This acid is found in high concentrations in citrus fruits such as lemons, limes, oranges, and grapefruits. Its name is derived from this very source. It is responsible for their distinctively sharp, sour taste.
- **(D) Tartaric acid:** This is the principal acid found in grapes and is also present in tamarinds and bananas.

Given the options, citric acid is the defining acid of citrus fruits.

Step 3: Final Answer:

The major acid present in citrus fruits is Citric acid.

 Quick Tip

A simple way to remember is by the name itself: **Citric** acid is the dominant acid in **citrus** fruits. Similarly, malic acid (from Latin 'malum' for apple) is found in apples, and tartaric acid is key to the 'tart' taste of wine from grapes.

8. During the ripening of fruits, which gas acts as a natural ripening hormone?

- (A) Oxygen
- (B) Carbon dioxide
- (C) Ethylene
- (D) Nitrogen

Correct Answer: (C) Ethylene

Solution:

Fruit ripening is a complex, genetically programmed process that involves changes in color, flavor, aroma, and texture. This process is regulated by plant hormones, one of which is a simple gaseous compound.

Step 1: Understanding the Question:

The question asks to identify the gas that functions as a plant hormone to trigger and promote the ripening of fruit.

Step 2: Detailed Explanation:

Let's evaluate the role of each gas in the context of fruit biology:

- **(A) Oxygen (O_2):** Oxygen is essential for aerobic respiration, the process by which the fruit generates energy. While respiration is active during ripening, oxygen itself is not the hormonal trigger.
- **(B) Carbon dioxide (CO_2):** Carbon dioxide is a product of respiration. In fact, high levels of CO_2 are often used in controlled atmosphere storage to inhibit the ripening process and extend the shelf life of fruits.
- **(C) Ethylene (C_2H_4):** Ethylene is a gaseous plant hormone that plays a central role in initiating and coordinating many aspects of ripening, especially in climacteric fruits (like bananas, apples, and tomatoes). It triggers the breakdown of starches into sugars, the softening of cell walls, and the development of color and aroma.
- **(D) Nitrogen (N_2):** Nitrogen is a largely inert gas that makes up about 78% of the atmosphere. It has no direct hormonal role in ripening and is often used in modified atmosphere packaging to displace oxygen and slow down spoilage.

Thus, ethylene is the specific gas that acts as a ripening hormone.

Step 3: Final Answer:

Ethylene is the gas that acts as a natural ripening hormone in fruits.

💡 Quick Tip

You can use this knowledge at home! To ripen a hard avocado or tomato quickly, place it in a paper bag with a ripe banana. The banana will release ethylene gas, which gets trapped in the bag and accelerates the ripening of the other fruit.

9. What is the purpose of adding 'Nitrites' in the curing process of meat products?

- (A) To increase moisture content
- (B) To enhance sweetness
- (C) To preserve color and inhibit microbial growth
- (D) To reduce fat content

Correct Answer: (C) To preserve color and inhibit microbial growth

Solution:

Curing is a food preservation and flavoring process for foods such as meat, fish, and vegetables, by the addition of a combination of salt, sugar, and nitrate or nitrite. Nitrites, in particular, serve several critical functions.

Step 1: Understanding the Question:

The question asks for the primary reasons for using nitrites in the curing of meat products like ham and bacon.

Step 2: Detailed Explanation:

Sodium nitrite is a multifunctional curing agent with several key roles:

1. **Inhibition of Microbial Growth:** Its most critical safety function is to inhibit the growth of the bacterium *Clostridium botulinum*, which can cause life-threatening botulism.
2. **Color Preservation:** Nitrite reacts with myoglobin (the protein responsible for the red color of meat) to form nitrosomyoglobin, which upon heating converts to the stable pink-red pigment nitrosohemochrome. This gives cured meats their characteristic color.
3. **Flavor Development:** It contributes to the unique "cured" flavor profile.
4. **Antioxidant Effect:** It slows the development of oxidative rancidity in the fat portion of the meat.

Evaluating the options:

- (A) and (D) are incorrect. Nitrites do not significantly affect moisture or fat content.
- (B) is incorrect. Sweetness is typically enhanced by adding sugar, not nitrites.
- (C) correctly summarizes the two most important functions: ensuring microbiological safety and providing the desirable stable color.

Step 3: Final Answer:

The purpose of adding nitrites is to preserve color and inhibit microbial growth.

💡 Quick Tip

While essential for safety and quality in cured meats, the use of nitrites is strictly regulated. This is because they can potentially form carcinogenic compounds called nitrosamines under high heat, so the lowest effective level is always used.

10. Which organism is primarily responsible for the production of yogurt from milk?

- (A) *Saccharomyces cerevisiae*
- (B) *Lactobacillus bulgaricus*
- (C) *Aspergillus niger*
- (D) *Escherichia coli*

Correct Answer: (B) *Lactobacillus bulgaricus*

Solution:

Yogurt is a fermented dairy product created by the controlled fermentation of milk by specific types of bacteria. These bacteria convert the milk sugar (lactose) into lactic acid.

Step 1: Understanding the Question:

The question asks to identify the key microorganism involved in the fermentation process that turns milk into yogurt.

Step 2: Detailed Explanation:

Let's analyze the roles of the given organisms in food science:

- **(A) *Saccharomyces cerevisiae*:** This is a species of yeast. It is widely used in baking as a leavening agent and in brewing for alcoholic fermentation.
- **(B) *Lactobacillus bulgaricus*:** This is a species of lactic acid bacteria (LAB). It is one of the two standard bacteria used in a symbiotic starter culture for making yogurt, along with *Streptococcus thermophilus*. It is primarily responsible for the acid and flavor development.
- **(C) *Aspergillus niger*:** This is a type of mold (a fungus). It is used in industrial fermentation to produce enzymes and citric acid, but it is a spoilage organism in many other foods.
- **(D) *Escherichia coli*:** This is a bacterium commonly found in the lower intestine of warm-blooded organisms. While most strains are harmless, some can cause serious food poisoning, and its presence is often used as an indicator of fecal contamination.

Based on this, *Lactobacillus bulgaricus* is the correct organism for yogurt production.

Step 3: Final Answer:

Lactobacillus bulgaricus is a primary organism responsible for yogurt production.

💡 Quick Tip

The production of yogurt involves a symbiotic relationship. *Streptococcus thermophilus* grows first and reduces the pH, creating a better environment for *Lactobacillus bulgaricus*, which then produces most of the characteristic flavor compounds.

11. What is the moisture content level below which most bacteria cannot grow in dried foods?

- (A) 50%
- (B) 30%
- (C) 15%
- (D) 5%

Correct Answer: (C) 15%

Solution:

All microorganisms require water to grow and carry out metabolic functions. Drying is a preservation method that works by reducing the amount of available water, thus inhibiting microbial growth. The concept of water activity (a_w) is more scientifically precise, but moisture content is often used as a practical measure.

Step 1: Understanding the Question:

The question asks for the general moisture content threshold below which the growth of most bacteria is inhibited in dried food products.

Step 2: Detailed Explanation:

Different types of microorganisms have different water requirements:

- **Bacteria** generally have the highest water requirement. Most spoilage bacteria need a water activity (a_w) of 0.91 or higher, which corresponds to relatively high moisture content.
- **Yeasts** can tolerate slightly drier conditions, typically down to an a_w of 0.88.
- **Molds** are more tolerant of dry conditions and can grow at an a_w as low as 0.80.

A moisture content of 15% in many foods corresponds to a water activity level below 0.90, which is low enough to prevent the growth and multiplication of most pathogenic and spoilage bacteria. While 5% would be even more effective, 15% is a widely recognized general threshold

for controlling bacterial growth. Levels of 30% and 50% are far too high and would permit rapid bacterial spoilage.

Step 3: Final Answer:

The moisture content level below which most bacteria cannot grow is approximately 15%.

💡 Quick Tip

Remember that inhibiting growth is not the same as killing. Bacteria may survive in a dormant state in dried foods. If the food is rehydrated, they can begin to multiply again. This is why proper handling of rehydrated foods is important.

12. Which browning reaction occurs during the heating of sugars in the absence of nitrogenous compounds?

- (A) Maillard reaction
- (B) Enzymatic browning
- (C) Caramelization
- (D) Oxidative browning

Correct Answer: (C) Caramelization

Solution:

Browning reactions are responsible for many of the desirable colors and flavors in cooked foods. These reactions can be broadly categorized as enzymatic or non-enzymatic. The question focuses on a specific type of non-enzymatic browning.

Step 1: Understanding the Question:

The question asks to identify the browning reaction that involves only the heating of sugars, with the specific condition that no nitrogen-containing compounds (like proteins or amino acids) are present.

Step 2: Detailed Explanation:

Let's differentiate the major browning reactions:

- **(A) Maillard reaction:** This is a complex series of reactions between reducing sugars and amino acids (the building blocks of proteins) when heated. It is responsible for the browning of bread crust, seared meat, and roasted coffee. Since it requires amino acids, it is excluded by the question's condition.
- **(B) Enzymatic browning:** This reaction occurs in raw fruits and vegetables when they are cut or bruised. It is caused by enzymes like polyphenol oxidase acting on phenolic compounds in the presence of oxygen. It does not require high heat.

- **(C) Caramelization:** This is the thermal decomposition of sugar. When sugars are heated to high temperatures (typically above 160°C or 320°F), they melt and undergo a series of reactions that produce a range of brown-colored compounds and complex flavors. This process involves only sugar and heat, matching the question's description perfectly.
- **(D) Oxidative browning:** This is a more general term that can refer to browning caused by oxidation, such as in fats and oils, but it is not the specific term for the heating of sugars.

Step 3: Final Answer:

The browning reaction described is Caramelization.

💡 Quick Tip

A simple way to distinguish the two main non-enzymatic reactions: Maillard = Sugar + Amino Acid + Heat (e.g., toast). Caramelization = Sugar + Heat (e.g., caramel sauce).

13. What is the main carbohydrate found in cow's milk?

- (A) Glucose
- (B) Fructose
- (C) Lactose
- (D) Sucrose

Correct Answer: (C) Lactose

Solution:

Carbohydrates are a major class of macronutrients in food. They exist as simple sugars (monosaccharides), double sugars (disaccharides), and complex carbohydrates (polysaccharides). Milk has a unique primary carbohydrate.

Step 1: Understanding the Question:

The question asks to identify the principal carbohydrate, or sugar, present in cow's milk.

Step 2: Detailed Explanation:

Let's define the sugars listed in the options:

- **(A) Glucose:** A monosaccharide, or simple sugar. It is a fundamental energy source in living organisms but is not the main carbohydrate in milk in its free form.
- **(B) Fructose:** A monosaccharide commonly known as "fruit sugar" due to its high concentration in fruits.

- **(C) Lactose:** A disaccharide composed of one molecule of glucose and one molecule of galactose bonded together. It is uniquely synthesized in the mammary glands of mammals and is commonly referred to as "milk sugar". It is the main carbohydrate in milk, typically comprising around 4.5-5.0% of cow's milk by weight.
- **(D) Sucrose:** A disaccharide composed of glucose and fructose. It is commonly known as table sugar and is extracted from sugarcane or sugar beets.

Based on these definitions, lactose is the specific and primary carbohydrate of milk.

Step 3: Final Answer:

The main carbohydrate found in cow's milk is Lactose.

💡 Quick Tip

The word 'lactose' itself gives a clue, as 'lact-' is a prefix related to milk (e.g., lactation). The inability to digest lactose is known as lactose intolerance and is caused by a deficiency of the enzyme lactase.

14. Which packaging technique involves replacing the air inside a package with a specific gas mixture to extend shelf life?

- (A) Vacuum packaging
- (B) Modified Atmosphere Packaging
- (C) Aseptic packaging
- (D) Active packaging

Correct Answer: (B) Modified Atmosphere Packaging

Solution:

Modern food packaging goes beyond simple containment. Advanced techniques are used to actively preserve food quality and extend its shelf life by controlling the environment inside the package.

Step 1: Understanding the Question:

The question describes a specific packaging method where the normal atmosphere (air) is replaced with a controlled mixture of gases. We need to identify the correct term for this technique.

Step 2: Detailed Explanation:

Let's define the packaging techniques listed:

- **(A) Vacuum packaging:** This technique involves removing all the air from the package before sealing it. The goal is to eliminate oxygen to slow down the growth of aerobic mi-

croorganisms and prevent oxidation. It does not involve replacing the air with another gas.

- **(B) Modified Atmosphere Packaging (MAP):** This is the exact process described in the question. The air inside a package is flushed out and replaced with a specific gas mixture (e.g., carbon dioxide, nitrogen, oxygen) tailored to the specific food product. This "modified atmosphere" slows down spoilage and preserves quality.
- **(C) Aseptic packaging:** This is a sterilization technique where both the food product and the packaging material are sterilized separately and then combined and sealed in a sterile environment. It is used for shelf-stable products like UHT milk and juice boxes.
- **(D) Active packaging:** This involves incorporating substances into the packaging material that actively interact with the food or the headspace to improve shelf life. Examples include oxygen scavengers, moisture absorbers, and ethylene absorbers.

The key phrase "replacing the air... with a specific gas mixture" points directly to Modified Atmosphere Packaging.

Step 3: Final Answer:

The correct technique is Modified Atmosphere Packaging.

💡 Quick Tip

The gas mixture in MAP is chosen specifically for the food. For example, fresh-cut salads might use a low-oxygen, high-carbon dioxide mix to slow respiration and microbial growth, while red meat packages use a high-oxygen mix to maintain the desirable bright red color.

15. What is the function of an emulsifier in a food system like mayonnaise?

- (A) To enhance sweetness
- (B) To stabilize a mixture of immiscible liquids
- (C) To increase acidity
- (D) To preserve color

Correct Answer: (B) To stabilize a mixture of immiscible liquids

Solution:

Many food products, such as mayonnaise, salad dressings, and milk, are emulsions. An emulsion is a mixture of two or more liquids that are normally immiscible (unmixable), like oil and water. These mixtures are inherently unstable and require a specific type of agent to prevent them from separating.

Step 1: Understanding the Question:

The question asks for the primary role of an emulsifier, using mayonnaise (a classic oil-in-water emulsion) as an example.

Step 2: Detailed Explanation:

Emulsifiers are molecules that have a dual nature: one part is hydrophilic (water-loving) and the other part is hydrophobic or lipophilic (oil-loving). This structure allows them to position themselves at the interface between oil droplets and the surrounding water.

The function of an emulsifier is:

- To reduce the interfacial tension between the two liquids, making it easier to form a mixture of fine droplets.
- To form a stable film around the dispersed droplets, which prevents them from coalescing and separating out.

In essence, an emulsifier **stabilizes** the mixture. Let's look at the options:

- (A), (C), and (D) are incorrect. Emulsifiers do not primarily function to add sweetness, increase acidity, or preserve color, although some may have minor secondary effects.
- (B) accurately describes the core function of an emulsifier: to create and maintain a stable mixture of liquids that would otherwise separate, like the oil and vinegar/lemon juice in mayonnaise.

In mayonnaise, lecithin from the egg yolk is the primary emulsifier.

Step 3: Final Answer:

The function of an emulsifier is to stabilize a mixture of immiscible liquids.

💡 Quick Tip

Think of an emulsifier as a "bridge" molecule. One end of the bridge connects to the oil droplets, and the other end connects to the water, holding the entire system together and preventing the "traffic" (the droplets) from crashing and separating.