

# CUET PG 2026 Food Science Question Paper with Solutions(Memory Based)

Time Allowed :1 Hours 30 min	Maximum Marks :300	Total Questions :75
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## General Instructions

1. The exam lasts 90 minutes (1 hour 30 minutes).
2. There are 75 Multiple Choice Questions (MCQs) to be answered.
3. +4 marks for every correct answer. -1 mark (negative marking) for every incorrect answer. 0 marks for unanswered or un-attempted questions.
4. For any discrepancy in questions, the English version is considered final (except for language-specific papers).
5. Click one of the four options to choose an answer.
6. You must click "Save & Next" to confirm your response. Only saved answers are considered for evaluation.
7. Use "Mark for Review & Next" to flag a question for later. You can unselect or change your answer using the "Clear Response" button.
8. All calculations must be done on the Rough Sheets provided at the centre. These must be returned to the invigilator after the exam.

**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:

**Concept:** Wheat contains storage proteins that are responsible for the elasticity and structure of dough. The most important of these is **gluten**, which is a composite of two proteins:

- Gliadin – provides extensibility (stretching ability)
- Glutenin – provides elasticity (strength and structure)

When water is added to wheat flour and kneaded, these proteins interact to form a network called gluten, giving dough its characteristic texture.

**Step 1: Identify the protein responsible for dough formation.**

Among the given options:

- Casein – found in milk
- Albumin – found in eggs

- Gluten – found in wheat
- Keratin – found in hair and nails

**Step 2: Select the correct protein.**

Gluten is responsible for the viscoelastic nature of dough, enabling it to rise and maintain shape.

**Quick Tip**

Gluten formation is essential in baking because it traps gases produced during fermentation, helping bread rise and develop structure.

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**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:**

**Concept:** Pasteurisation is a heat treatment process used to destroy harmful microorganisms in milk. To verify its effectiveness, certain enzymes naturally present in milk are monitored. **Alkaline phosphatase** is the most commonly used indicator because it is more heat-resistant than most pathogens.

**Step 1: Understand the role of indicator enzymes.**

An ideal indicator enzyme should be:

- Present in raw milk
- Destroyed at pasteurisation temperatures
- More heat-resistant than pathogens

**Step 2: Identify the correct enzyme.**

Alkaline phosphatase satisfies these conditions, so its absence after treatment confirms proper pasteurisation.

**Quick Tip**

If phosphatase activity is detected after pasteurisation, it indicates inadequate heat treatment or post-process contamination.

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**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:**

**Concept:** The **D-value (Decimal Reduction Time)** is an important parameter in food microbiology that measures the resistance of microorganisms to a specific temperature. It represents the time required to reduce the microbial population by one log cycle (i.e., 90%).

**Step 1: Define D-value.**

D-value is the time needed at a given temperature to reduce the number of viable microorganisms to one-tenth of its original count.

**Step 2: Interpret its significance.**

It helps in designing thermal processing conditions to ensure food safety while maintaining quality.

Quick Tip

A higher D-value means microorganisms are more resistant to heat, requiring longer processing times for effective preservation.

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**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:**

**Concept:** Oxidative rancidity is a major cause of spoilage in foods containing fats and oils. It occurs due to the oxidation of lipids, leading to off-flavors, odors, and loss of nutritional quality. Metal ions such as iron and copper act as catalysts that accelerate this oxidation process.

Sequestering agents, also known as chelating agents, are substances that bind to these metal ions and render them inactive. By doing so, they slow down or prevent oxidative reactions in food systems.

**Step 1: Understand the role of sequestering agents.**

Sequestering agents:

- Bind metal ions like  $\text{Fe}^{2+}$  and  $\text{Cu}^{2+}$
- Prevent these ions from catalyzing oxidation
- Help in extending shelf life of food products

**Step 2:** Analyze the given options.

- Sodium benzoate – preservative against microbial growth
- EDTA – strong chelating (sequestering) agent
- Citric acid – weak chelating agent, mainly used for acidity
- Sodium chloride – common salt, not a chelating agent

**Step 3:** Select the most effective agent.

EDTA (Ethylenediaminetetraacetic acid) is widely used in food systems because of its strong ability to bind metal ions and prevent oxidative rancidity.

#### Quick Tip

Sequestering agents like EDTA are often used in combination with antioxidants to provide better protection against oxidation in processed foods.

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**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:**

**Concept:** Pasteurisation is a thermal processing technique used to destroy pathogenic microorganisms in liquid foods such as milk, juice, and beverages. It involves heating the product to a specific temperature for a short period of time, followed by rapid cooling.

The most common method is **HTST (High Temperature Short Time)** pasteurisation, typically carried out at around 72°C for 15 seconds. This method ensures microbial safety while preserving the nutritional and sensory qualities of the food.

**Step 1:** Understand the objective of the process.

The goal is to:

- Destroy harmful (pathogenic) microorganisms
- Reduce spoilage organisms
- Maintain food quality and nutrients

**Step 2:** Differentiate from other processes.

- Sterilisation – destroys all microorganisms including spores (more intense heat)
- Pasteurisation – destroys mainly pathogens, not all spores

- Fermentation – uses microbes to produce food
- Dehydration – removes moisture to preserve food

**Step 3: Identify the correct process.**

Since the question specifies high heat for a short time in liquid foods, this clearly refers to pasteurisation, specifically the HTST method.

**Quick Tip**

Pasteurisation does not make food sterile; it only reduces microbial load to safe levels, which is why pasteurised products still require refrigeration.

**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:**

**Concept:** Vitamins are classified based on their solubility into fat-soluble (A, D, E, K) and water-soluble (B-complex and C). Water-soluble vitamins are more prone to loss during cooking processes, especially boiling, due to their ability to dissolve in water and their sensitivity to heat.

Vitamin C (ascorbic acid) is particularly unstable and easily destroyed by:

- Heat
- Oxygen exposure
- Leaching into cooking water

**Step 1: Identify the nature of vitamins in the options.**

- Vitamin A – fat-soluble, relatively stable
- Vitamin D – fat-soluble, heat stable
- Vitamin C – water-soluble, heat sensitive
- Vitamin K – fat-soluble, stable

**Step 2: Understand the effect of boiling.**

During boiling:

- Water-soluble vitamins dissolve into the cooking water
- Heat further degrades sensitive vitamins

**Step 3:** Select the most susceptible vitamin.

Vitamin C is the most susceptible to loss because it is both water-soluble and highly heat-sensitive.

**Quick Tip**

To retain Vitamin C in vegetables, prefer steaming or microwaving instead of boiling, and avoid overcooking.

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**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:**

**Concept:** Organic acids are naturally present in fruits and contribute to their taste, preservation, and biochemical properties. Citrus fruits such as lemons, oranges, and limes are particularly rich in citric acid, which gives them their characteristic sour taste.

**Step 1:** Understand the role of acids in fruits.

Organic acids:

- Provide sourness and flavor
- Act as natural preservatives
- Participate in metabolic pathways

**Step 2:** Analyze the given options.

- Acetic acid – found in vinegar
- Lactic acid – found in fermented products like curd
- Citric acid – found in citrus fruits
- Tartaric acid – found in grapes and tamarind

**Step 3:** Identify the correct acid.

Citrus fruits predominantly contain citric acid, making it the correct answer.

**Quick Tip**

Citric acid is widely used in the food industry as an acidulant, preservative, and flavor enhancer due to its natural occurrence and safety.

**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:**

**Concept:** Fruit ripening is a complex physiological and biochemical process involving changes in color, texture, flavor, and aroma. This process is regulated by plant hormones, among which **ethylene** plays a crucial role.

Ethylene is a gaseous plant hormone that:

- Accelerates ripening in climacteric fruits (e.g., bananas, apples, tomatoes)
- Promotes conversion of starch into sugars
- Causes softening of fruits by breaking down cell walls
- Enhances development of flavor and aroma compounds

**Step 1: Identify the role of gases in ripening.**

Among common gases, only ethylene functions as a natural plant hormone involved in ripening.

**Step 2: Analyze the given options.**

- Oxygen – required for respiration, not a ripening hormone
- Carbon dioxide – involved in respiration and storage control
- Ethylene – natural ripening hormone
- Nitrogen – inert gas, no role in ripening

**Step 3: Select the correct gas.**

Ethylene is the correct answer as it directly regulates and accelerates fruit ripening.

#### Quick Tip

Fruits like bananas are often artificially ripened by exposing them to ethylene gas in controlled environments.

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**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:**

**Concept:** Nitrites are widely used in the curing of meat products such as bacon, ham, and sausages. They play multiple important roles in preservation, safety, and quality of processed meats.

Key functions of nitrites include:

- Inhibition of pathogenic microorganisms, especially *Clostridium botulinum*
- Development and stabilization of the characteristic pink color of cured meats
- Contribution to flavor development
- Acting as antioxidants to prevent lipid oxidation

**Step 1: Understand the need for curing agents.**

Meat is highly perishable due to microbial growth and fat oxidation. Curing agents like nitrites help in extending shelf life and ensuring safety.

**Step 2: Evaluate the given options.**

- Increase moisture – not the function of nitrites
- Enhance sweetness – unrelated
- Preserve color and inhibit microbes – correct function
- Reduce fat – not applicable

**Step 3: Identify the correct purpose.**

Nitrites are primarily added to maintain the desirable color and to inhibit the growth of harmful microorganisms.

**Quick Tip**

Excessive intake of nitrites can be harmful, so their use in foods is strictly regulated to ensure safety.

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**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:**

**Concept:** Yogurt is a fermented dairy product produced by the action of specific lactic acid bacteria. The primary microorganisms involved are **Lactobacillus bulgaricus** and **Streptococcus thermophilus**, which work symbiotically.

These bacteria ferment lactose (milk sugar) into lactic acid, leading to:

- Coagulation of milk proteins (casein)
- Development of characteristic sour taste
- Improved digestibility and shelf life

**Step 1:** Identify the type of fermentation.

Yogurt production involves lactic acid fermentation carried out by beneficial bacteria.

**Step 2:** Analyze the given organisms.

- *Saccharomyces cerevisiae* – yeast used in baking and brewing
- *Lactobacillus bulgaricus* – lactic acid bacteria used in yogurt
- *Aspergillus niger* – fungus used in enzyme production
- *Escherichia coli* – pathogenic bacterium

**Step 3:** Select the correct organism.

Among the options, *Lactobacillus bulgaricus* is the primary organism responsible for yogurt production.

#### Quick Tip

Yogurt cultures are often a combination of bacteria, but *Lactobacillus bulgaricus* plays a key role in acid production and flavor.

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**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:**

**Concept:** Microbial growth in foods is highly dependent on the availability of water, often expressed as moisture content or water activity ( $a_w$ ). Bacteria generally require higher moisture levels compared to molds and yeasts.

In dried foods, reducing moisture content inhibits microbial growth and enhances shelf life. Most bacteria cannot grow effectively when moisture content falls below a certain threshold.

**Step 1:** Understand moisture requirements of bacteria.

- Bacteria require high moisture levels for growth
- They are more sensitive to low moisture than molds and yeasts

**Step 2: Interpret the critical moisture level.**

When moisture content drops below approximately 15%, conditions become unfavorable for most bacterial growth.

**Step 3: Select the correct option.**

Thus, 15% is the threshold below which most bacteria cannot grow in dried foods.

**Quick Tip**

While bacteria are inhibited at low moisture, some molds and yeasts can still grow, so proper storage is still important.

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**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:**

**Concept:** Browning reactions in foods are broadly classified into enzymatic and non-enzymatic types. Among non-enzymatic browning reactions, two major types are the Maillard reaction and caramelization.

- **Maillard reaction** involves reducing sugars reacting with amino acids (requires nitrogenous compounds).
- **Caramelization** involves the thermal decomposition of sugars alone, without the involvement of proteins or amino acids.

**Step 1: Understand the condition given.**

The question specifies heating of sugars **in the absence of nitrogenous compounds**, which rules out the Maillard reaction.

**Step 2: Analyze the options.**

- Maillard reaction – requires amino acids (not applicable)
- Enzymatic browning – involves enzymes like polyphenol oxidase
- Caramelization – occurs with sugars alone upon heating
- Oxidative browning – involves oxidation reactions

**Step 3: Identify the correct reaction.**

Caramelization is the correct process as it involves heating sugars without nitrogenous compounds.

### Quick Tip

Caramelization is responsible for the brown color and rich flavor in foods like caramel, toffee, and baked goods.

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

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

**Correct Answer:** (C) Lactose

#### **Solution:**

**Concept:** Milk contains several nutrients including proteins, fats, vitamins, minerals, and carbohydrates. The primary carbohydrate present in milk is **lactose**, also known as milk sugar.

Lactose is a disaccharide composed of:

- Glucose
- Galactose

It plays an important role in:

- Providing energy
- Supporting growth of beneficial gut bacteria
- Contributing to the taste of milk

#### **Step 1: Identify carbohydrates in milk.**

Unlike fruits (which contain fructose) or table sugar (sucrose), milk uniquely contains lactose.

#### **Step 2: Analyze the options.**

- Glucose – simple sugar, not the main milk carbohydrate
- Fructose – fruit sugar
- Lactose – milk sugar (correct)
- Sucrose – table sugar

#### **Step 3: Select the correct answer.**

Thus, lactose is the main carbohydrate found in cow's milk.

### Quick Tip

People with lactose intolerance lack the enzyme lactase, which is needed to digest lactose properly.

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**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:**

**Concept:** Food packaging plays a crucial role in preserving quality and extending shelf life. One advanced technique is **Modified Atmosphere Packaging (MAP)**, where the normal air inside a package is replaced with a controlled mixture of gases such as carbon dioxide (CO<sub>2</sub>), nitrogen (N<sub>2</sub>), and sometimes oxygen (O<sub>2</sub>).

This modification helps in:

- Slowing down microbial growth
- Reducing oxidation reactions
- Maintaining color, texture, and freshness of food

**Step 1:** Understand the key feature in the question.

The question mentions replacing air with a **specific gas mixture**, which is characteristic of MAP.

**Step 2:** Analyze the options.

- Vacuum packaging – removes air completely but does not replace it with gases
- Modified Atmosphere Packaging – replaces air with controlled gases (correct)
- Aseptic packaging – involves sterilization and packaging in sterile conditions
- Active packaging – interacts with food but does not necessarily replace air

**Step 3:** Select the correct technique.

Thus, Modified Atmosphere Packaging is the correct answer.

#### Quick Tip

MAP is widely used for fresh produce, meat, and bakery products to extend shelf life without using preservatives.

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**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:**

**Concept:** An emulsion is a mixture of two immiscible liquids, such as oil and water. In food systems like mayonnaise, oil and water would naturally separate due to differences in polarity. An **emulsifier** is added to stabilize this mixture.

Common emulsifiers (e.g., lecithin in egg yolk) have:

- A hydrophilic (water-attracting) end
- A hydrophobic (oil-attracting) end

This dual nature allows them to reduce surface tension and keep oil and water uniformly mixed.

**Step 1: Understand the problem in emulsions.**

Oil and water do not mix naturally and tend to separate over time.

**Step 2: Role of emulsifier.**

An emulsifier:

- Forms a stable interface between oil and water
- Prevents separation
- Improves texture and consistency

**Step 3: Analyze the options.**

- Enhance sweetness – unrelated
- Stabilize immiscible liquids – correct
- Increase acidity – unrelated
- Preserve color – unrelated

**Step 4: Select the correct function.**

Thus, emulsifiers stabilize mixtures like mayonnaise by keeping oil and water combined.

**Quick Tip**

Without an emulsifier, products like mayonnaise or salad dressings would quickly separate into oil and water layers.