EXAM STYLE QUESTIONS

FOOD PREPARATION & NUTRITION

WRITE IN FULL SENTENCES ON LINED PAPER

Food Nutrition & Health:

Question 1: Nutrients and Health

a. Explain why a balanced diet is important for a teenager. Include references to macronutrients and micronutrients in your answer. (6 marks)

b. Describe two changes in nutritional needs from adolescence to adulthood. (4 marks)

Question 2: Macronutrients

a. Compare the roles of soluble and insoluble fibre in the diet. (4 marks)

b. Discuss the impact of excessive and insufficient dietary fat intake on health. Use examples to support your answer. (6 marks)

Question 3: Micronutrients

a. Vitamin D is important for bone health. Describe how Vitamin D can be obtained and why it is important for the elderly. (4 marks)

b. Iron deficiency can lead to anaemia. Outline the symptoms of iron deficiency anaemia and suggest dietary sources to prevent it. (6 marks)

Question 4: Nutritional Needs and Health

a. 'The nutritional needs vary through different life stages.' Discuss this statement and provide examples for infants and the elderly. (6 marks)

b. Evaluate how cooking methods can affect the nutritional value of food. Provide examples to illustrate your points. (4 marks)

Question 5: Planning Balanced Meals

a. Describe how you would plan a meal for a coeliac patient. Include considerations for cross-contamination. (4 marks)

b. Explain the importance of meal planning for individuals with Type 2 diabetes. (6 marks)

Question 6: Diet, Nutrition, and Health Risks

a. Discuss the relationship between diet, nutrition, and cardiovascular health. Include specific dietary components and their effects. (6 marks)

b. How can diet influence dental health? Provide two examples of how specific foods can impact dental health. (4 marks)

Food Science:

Functional and Chemical Properties of Fats in Food

1. Describe two functions of fats in food preparation. Provide examples to support your answer. (6 marks)

2. Explain the difference between saturated and unsaturated fats. Include their chemical structure and sources in your answer. (8 marks)

3. Discuss the process of hydrogenation and its impact on the healthfulness of fats. (6 marks)

4. What is rancidity in fats? Explain how it occurs and suggest two methods to prevent it. (6 marks)

5. Compare the roles of triglycerides, phospholipids, and sterols in the human diet. (9 marks)

Function of Gluten in Carbohydrates

1. Define gluten and explain how it is formed in dough. (4 marks)

2. Describe the functions of gluten in bread making. How does gluten affect the texture and structure of the final product? (6 marks)

3. Explain the differences between bread flour, all-purpose flour, and cake flour in terms of gluten content and their uses in baking. (8 marks)

4. Discuss the challenges and solutions when using gluten-free flours in baking. (6 marks)

5. How do water content, kneading, and resting time influence gluten development in dough? (9 marks)

Enzymic Browning and Its Prevention

1. What is enzymic browning? Identify two foods that are susceptible to this process. (4 marks)

2. Describe the biochemical process that leads to enzymic browning in fruits and vegetables. (6 marks)

3. Explain three methods to prevent enzymic browning in food preparation. (6 marks)

4. Conduct an experiment to investigate the effectiveness of different methods in preventing enzymic browning in apple slices. Outline your method, results, and conclusion. (10 marks)

Raising Agents and Their Effects

1. List and describe the three main types of raising agents used in baking. Provide an example of a food product for each type. (6 marks)

2. Explain the role of yeast as a biological raising agent in bread making. How does it contribute to the texture and flavour of the bread? (6 marks)

3. Compare the effects of using baking powder and whisked egg whites as raising agents in cakes. (8 marks)

4. What happens if too much or too little raising agent is used in a recipe? Use examples to illustrate your answer. (6 marks)

Gelatinisation, Dextrinisation, Caramelisation

1. Define gelatinisation and describe its role in the preparation of sauces and custards. (6 marks)

2. Explain the process of dextrinisation and provide two examples of foods where this process occurs. (6 marks)

3. What is caramelisation? Discuss the stages of caramelisation and the impact on flavour and colour in food preparation. (8 marks)

4. Design an experiment to demonstrate gelatinisation, dextrinisation, and caramelisation. Include your method, expected results, and potential applications in cooking. (10 marks)

Food Choices and Food Provenance:

Food Choices:

1. Discuss how cultural factors influence food choices. Provide examples from at least two different cultures. (8 marks)

2. Explain the impact of advertising and marketing on food choices among teenagers. (6 marks)

3. Describe the role of personal preferences in food selection. How do taste, texture, and appearance affect individual food choices? (6 marks)

4. Evaluate the influence of ethical considerations on food choices. Include examples such as vegetarianism, veganism, and fair trade. (8 marks)

5. How do economic factors affect food choices? Discuss the impact of income, food prices, and availability on dietary habits. (6 marks)

6. Analyse how health concerns and nutritional information shape food choices. Consider the role of food labels, dietary guidelines, and public health campaigns. (8 marks)

7. Describe the influence of social factors on food choices, including family, peers, and social media. (6 marks)

Food Provenance:

1. Define food provenance and explain why it is important for consumers. (6 marks)

2. Discuss the environmental impact of food production. Include topics such as greenhouse gas emissions, water usage, and land use. (8 marks)

3. Explain the concept of food miles and its relevance to food provenance. How can consumers reduce their food miles? (6 marks)

4. Evaluate the benefits and challenges of organic farming practices. (8 marks)

5. Describe the principles of Fair Trade and its significance in food production and consumption. (6 marks)

6. Discuss the role of local food systems in promoting sustainability. Provide examples of how buying locally can benefit the environment and the community. (8 marks)

7. Analyse the impact of food provenance on food quality and safety. Consider factors such as traceability, transparency, and food fraud. (8 marks)

8. How does food provenance influence consumer trust and purchasing decisions? Discuss with examples. (6 marks)

Food Processing and Production:

Primary Processing

1. Define primary food processing and explain its importance in the food industry. (6 marks)

2. Describe the primary processing steps involved in turning wheat into flour. (8 marks)

3. Explain how primary processing can affect the nutritional value of foods. Provide specific examples. (6 marks)

4. List and describe three examples of primary processing methods. (6 marks)

Secondary Processing

1. What is secondary food processing? Provide a definition and explain its role in the food industry. (6 marks)

2. Describe the secondary processing steps involved in turning milk into cheese. (8 marks)

3. Discuss how secondary processing alters the properties of food. Use examples to explain changes in texture, flavour, and appearance. (6 marks)

4. Identify and describe three examples of secondary processing methods. (6 marks)

Fortification

1. Define food fortification and explain its purpose. (6 marks)

2. List five examples of fortified foods and state the nutrients added to each. (10 marks)

3. Discuss the impact of food fortification on public health, providing examples of successful fortification programs. (8 marks)

4. What are the key regulations governing food fortification in the UK? (6 marks)

Additives

1. What are food additives? List and describe the main categories of food additives. (8 marks)

2. Choose three types of additives and explain their functions in food products, providing specific examples. (6 marks)

3. Discuss the potential health impacts of food additives and the measures taken to ensure their safety. (8 marks)

4. Research and identify common additives in a processed food item. Explain the role of each additive. (8 marks)

Heat Treatment Methods

1. Describe the main types of heat treatment methods used in food processing. (8 marks)

2. Explain the purpose and benefits of heat treatment methods in food processing. (6 marks)

3. Discuss how different heat treatment methods affect the nutritional value and sensory properties of food, providing examples. (8 marks)

4. Describe the process of pasteurisation and UHT (ultra-high temperature) treatment of milk. How do these methods differ in terms of process and end product? (8 marks)

EXAM STYLE QUESTIONS

FOOD PREPARATION & NUTRITION

MARK SCHEME – ANSWERS

Tips for Self-Marking:

- **Use Examples:** Ensure you include specific examples where requested.
- **Detail and Accuracy:** Provide detailed and accurate explanations, using correct scientific terminology.
- **Application of Knowledge:** Demonstrate the ability to apply knowledge to practical scenarios and experiments.
- **Clarity:** Responses should be clear, logical, and well-structured**.**

Food Nutrition & Health: ANSWERS

Question 1: Nutrients and Health

a. (6 marks)

- Discusses the need for energy and how macronutrients (carbohydrates, proteins, and fats) provide this (1 mark).
- Explains the role of micronutrients (vitamins and minerals) in maintaining health (1 mark).
- Mentions specific benefits like growth, immune function, and bone health appropriate for teenagers (2 marks).
- Includes examples of sources for these nutrients (1 mark).
- Explains the concept of balance in a diet and consequences of imbalance (1 mark).

b. (4 marks)

- Mentions increased need for calories due to growth during adolescence (1 mark).
- Describes changes in nutrient demands, such as iron due to menstruation in females (1 mark).
- Explains the need for more calcium in adulthood to prevent osteoporosis (1 mark).
- Additional point on change in dietary needs based on activity level or metabolic changes (1 mark).

Question 2: Macronutrients

a. (4 marks)

- Defines soluble fibre (e.g., helps to lower cholesterol, manage blood glucose) (1 mark).
- Defines insoluble fibre (e.g., aids in digestion and bowel health) (1 mark).
- Provides food sources for both types (1 mark).
- Discusses the health benefits of both, linking to digestive health (1 mark).

b. (6 marks)

- Discusses the role of dietary fats in body functions like hormone production, energy storage (1 mark).
- Explains consequences of excessive intake, such as heart disease, obesity (2 marks).
- Explains consequences of insufficient intake, such as poor vitamin absorption, hormonal imbalances (2 marks).
- Provides examples of healthy vs unhealthy fats (1 mark).

Question 3: Micronutrients

a. (4 marks)

- Describes sources of Vitamin D (sun exposure, dietary sources like oily fish) (1 mark).
- Explains the role of Vitamin D in bone health, e.g., aids calcium absorption (1 mark).
- Discusses the importance for the elderly, such as preventing osteoporosis and falls (1 mark).
- Mentions government recommendations for supplementation, especially in winter months (1 mark).

b. (6 marks)

- Lists symptoms of iron deficiency anaemia (e.g., fatigue, pale skin) (1 mark).
- Explains the role of iron in haemoglobin and oxygen transport (1 mark).
- Provides dietary sources of iron (e.g., red meat, fortified cereals) (1 mark).

- Discusses strategies to enhance iron absorption (e.g., consuming vitamin C-rich foods alongside iron) (1 mark).
- Explains consequences of deficiency more broadly, impacting overall energy and cognitive function (1 mark).
- Provides preventative measures against iron deficiency anaemia (1 mark).

Question 4: Nutritional Needs and Health

a. (6 marks)

- Describes nutritional needs of infants (e.g., high in fat for brain development) (1 mark).
- Describes nutritional needs of the elderly (e.g., higher in calcium, vitamin D) (1 mark).
- Explains the reasons for these needs based on physiological changes (2 marks).
- Provides examples of suitable diets or food items for each group (2 marks).

b. (4 marks)

- Discusses the impact of cooking methods on nutrient retention (e.g., steaming vs. boiling) (1 mark).
- Provides examples of how nutrients are lost or preserved (1 mark).
- Discusses the health implications of these losses (e.g., loss of water-soluble vitamins) (1 mark).
- Suggests cooking practices to maximize nutrient preservation (1 mark).

Question 5: Planning Balanced Meals

a. (4 marks)

- Describes key considerations for a coeliac patient (avoiding gluten, importance of cross-contamination) (1 mark).
- Provides examples of gluten-free food choices (1 mark).
- Discusses meal planning strategies to ensure nutritional adequacy (1 mark).
- Mentions practical steps for avoiding cross-contamination (1 mark).

b. (6 marks)

- Explains the importance of controlled carbohydrate intake for diabetes management (1 mark).
- Discusses the role of dietary fibre in blood sugar control (1 mark).
- Provides a sample meal plan illustrating balanced carb intake (2 marks).
- Discusses the importance of regular meal timing (1 mark).
- Explains the implications of unmanaged diabetes, emphasizing dietary management (1 mark).

Question 7: Diet, Nutrition, and Health Risks

a. (6 marks)

- Discusses the relationship between saturated fat intake and cardiovascular health (1 mark).
- Explains the role of dietary fibre in reducing heart disease risk (1 mark).
- Provides examples of diets high in beneficial nutrients (e.g., Mediterranean diet) (1 mark).
- Discusses the impact of salt in hypertension (1 mark).
- Links dietary choices to specific cardiovascular outcomes (1 mark).
- Suggests dietary adjustments for improving heart health (1 mark).

b. (4 marks)

- Describes how sugary foods contribute to dental cavities (1 mark).
- Discusses the role of acidity in foods in dental erosion (1 mark).
- Provides preventive strategies through diet (1 mark).
- Mentions the importance of dental hygiene practices in conjunction with dietary measures (1 mark).

Food Science: ANSWERS

Functional and Chemical Properties of Fats in Food

Describe two functions of fats in food preparation. Provide examples to support your answer. (6 marks)

- Energy Source: Fats provide a concentrated source of energy, with 9 kcal per gram (2 marks).
- Flavour and Aroma: Fats enhance the flavour and aroma of foods, making them more palatable (2 marks).
- Examples: E.g., butter in baking adds flavour and helps with browning (1 mark), oils in dressings improve texture and flavour (1 mark).

Explain the difference between saturated and unsaturated fats. Include their chemical structure and sources in your answer. (8 marks)

- Saturated Fats: Solid at room temperature, contain no double bonds in their chemical structure (2 marks).
- Sources: Butter, lard, coconut oil (2 marks, 1 mark each for two sources).
- Unsaturated Fats: Liquid at room temperature, contain one or more double bonds (2 marks).

- Sources: Olive oil, sunflower oil, fish oil (2 marks, 1 mark each for two sources).

Discuss the process of hydrogenation and its impact on the healthfulness of fats. (6 marks)

- Hydrogenation Process: Adding hydrogen to unsaturated fats to make them more solid and stable (2 marks).
- Impact: Increases shelf life and solidity of products like margarine (2 marks).
- Health Implications: Can create trans fats, which are linked to increased risk of heart disease (2 marks).

What is rancidity in fats? Explain how it occurs and suggest two methods to prevent it. (6 marks)

- Rancidity: The deterioration of fats, leading to off-flavours and smells (2 marks).
- Causes: Oxidation, microbial activity (2 marks).
- Prevention Methods: Use of antioxidants (e.g., Vitamin E) (1 mark), storing fats in airtight containers away from light and heat (1 mark).

Compare the roles of triglycerides, phospholipids, and sterols in the human diet. (9 marks)

- Triglycerides: Main form of fat in food and body, provide energy, store energy (3 marks).
- Phospholipids: Essential for cell membranes, help transport fats in the bloodstream (3 marks).
- Sterols: Cholesterol is the most known, important for cell membrane structure, precursor for hormones like oestrogen and testosterone (3 marks).

Function of Gluten in Carbohydrates

Define gluten and explain how it is formed in dough. (4 marks)

- Definition: Gluten is a protein found in wheat and related grains (2 marks).
- Formation: Formed when flour is mixed with water and kneaded, developing gluten strands (2 marks).

Describe the functions of gluten in bread making. How does gluten affect the texture and structure of the final product? (6 marks)

- Functions: Provides elasticity to dough, helps trap gas bubbles produced by yeast (2 marks).
- Texture Impact: Creates a chewy texture, important for the characteristic texture of bread (2 marks).
- Structure Impact: Helps dough rise and maintain its shape, provides volume and airy structure (2 marks).

Explain the differences between bread flour, all-purpose flour, and cake flour in terms of gluten content and their uses in baking. (8 marks)

- Bread Flour: High gluten content, ideal for yeast breads that need strong structure (3 marks).

- All-Purpose Flour: Moderate gluten content, versatile for a variety of baking needs including cookies and some cakes (3 marks).
- Cake Flour: Low gluten content, suitable for tender baked goods like cakes and pastries (2 marks).

Discuss the challenges and solutions when using gluten-free flours in baking. (6 marks)

- Challenges: Lack of elasticity and structure, can result in dense or crumbly products (2 marks).
- Solutions: Use of binders like xanthan gum or guar gum to mimic gluten properties (2 marks), alternative techniques like blending different flours for better results (2 marks).

How do water content, kneading, and resting time influence gluten development in dough? (9 marks)

- Water Content: Adequate hydration is necessary for gluten formation, too much or too little affects dough consistency (3 marks).
- Kneading: Develops gluten network, creating elasticity. Under-kneading results in weak structure, over-kneading can make dough tough (3 marks).
- Resting Time: Allows gluten to relax and become more extensible, improving dough handling and final texture (3 marks).

Enzymic Browning and Its Prevention

What is enzymic browning? Identify two foods that are susceptible to this process. (4 marks)

- Definition: Enzymic browning is the discolouration that occurs when enzymes in food react with oxygen (2 marks).
- Examples: Apples, potatoes (2 marks, 1 mark each for two foods).

Describe the biochemical process that leads to enzymic browning in fruits and vegetables. (6 marks)

- Process: Polyphenol oxidase enzymes react with phenolic compounds in the presence of oxygen (3 marks).
- Result: Formation of brown pigments called melanins, which cause the discolouration (3 marks).

Explain three methods to prevent enzymic browning in food preparation. (6 marks)

- Method 1: Acidulation, such as using lemon juice to lower pH and inhibit enzyme activity (2 marks).
- Method 2: Blanching, briefly boiling food to denature enzymes (2 marks).
- Method 3: Reducing exposure to oxygen, such as covering with plastic wrap or submerging in water (2 marks).

Conduct an experiment to investigate the effectiveness of different methods in preventing enzymic browning in apple slices. Outline your method, results, and conclusion. (10 marks)

- Method: Describe the treatment of apple slices with lemon juice, water, salt solution, and covering with plastic wrap. Include controls and timing of observations (4 marks).
- Results: Detailed observations of colour changes over time for each treatment (3 marks).
- Conclusion: Analysis of which methods were most effective and why, based on biochemical understanding (3 marks).

Raising Agents and Their Effects

List and describe the three main types of raising agents used in baking. Provide an example of a food product for each type. (6 marks)

- Biological: Yeast, which ferments sugars to produce carbon dioxide, used in bread (2 marks).
- Chemical: Baking powder, which releases carbon dioxide when it reacts with moisture and heat, used in cakes (2 marks).
- Physical: Air incorporation through whisking, such as egg whites in meringues (2 marks).

Explain the role of yeast as a biological raising agent in bread making. How does it contribute to the texture and flavour of the bread? (6 marks)

- Role of Yeast: Yeast ferments sugars in the dough, producing carbon dioxide that gets trapped in the gluten network, causing the dough to rise (2 marks).
- Texture Contribution: Creates an airy and light structure in the bread (2 marks).
- Flavour Contribution: Fermentation adds complex flavours to the bread, enhancing taste (2 marks).

Compare the effects of using baking powder and whisked egg whites as raising agents in cakes. (8 marks)

- Baking Powder: Causes chemical reaction that produces carbon dioxide, leading to a consistent rise and fluffy texture (4 marks).
- Whisked Egg Whites: Incorporates air physically, resulting in a light and airy texture but requires careful handling to maintain the air bubbles (4 marks).

What happens if too much or too little raising agent is used in a recipe? Use examples to illustrate your answer. (6 marks)

- Too Much Raising Agent: Can cause the product to over-expand and then collapse, leading to a dense or gummy texture. E.g., a cake may rise too quickly and then fall, creating a sunken centre (3 marks).
- Too Little Raising Agent: Results in insufficient rise, producing a dense and heavy texture. E.g., biscuits may turn out flat and hard (3 marks).

Gelatinisation, Dextrinisation, Caramelisation

Define gelatinisation and describe its role in the preparation of sauces and custards. (6 marks)

- Definition: Gelatinisation is the process where starch granules absorb water and swell when heated, thickening the mixture (3 marks).
- Role in Sauces and Custards: Helps thicken sauces and custards to the desired consistency, ensuring a smooth texture (3 marks).

Explain the process of dextrinisation and provide two examples of foods where this process occurs. (6 marks)

- Definition: Dextrinisation is the breakdown of starch into dextrin when exposed to dry heat, resulting in browning and flavour changes (3 marks).
- Examples: Toast (browning of bread) and roasted potatoes (crispy, browned exterior) (3 marks, 1.5 marks each).

What is caramelisation? Discuss the stages of caramelisation and the impact on flavour and colour in food preparation. (8 marks)

- Definition: Caramelisation is the browning of sugars when heated, leading to complex flavour and colour changes (2 marks).
- Stages: Melting of sugar, initial browning, development of complex flavours and darker colour (4 marks).
- Impact: Enhances flavour by adding a rich, sweet, and slightly bitter taste, and imparts a golden-brown colour to foods like caramel sauce, roasted vegetables (2 marks).

Design an experiment to demonstrate gelatinisation, dextrinisation, and caramelisation. Include your method, expected results, and potential applications in cooking. (10 marks)

- Method: Detailed steps for demonstrating each process:
- Gelatinisation: Mix starch and water, heat, observe thickening (2 marks).
- Dextrinisation: Toast bread, observe colour and texture changes (2 marks).
- Caramelisation: Heat sugar, observe stages of browning and flavour development (2 marks).
- Expected Results: Observations for each process, including thickening, browning, and flavour changes (3 marks).
- Applications: Practical uses in cooking, such as making sauces (gelatinisation), enhancing flavour of bread (dextrinisation), and creating desserts (caramelisation) (3 marks).

Food Choices: ANSWERS

1. Discuss how cultural factors influence food choices. Provide examples from at least two different cultures. (8 marks)

Identification of Cultural Factors: (4 marks)

- Explanation of how religion, traditions, and customs influence food choices (2 marks each for two cultural factors).

Examples: (4 marks)

- **Example 1:** Hindu dietary restrictions (e.g., vegetarianism, avoidance of beef) (2 marks).
- **Example 2:** Mediterranean diet, emphasizing fresh vegetables, olive oil, and seafood (2 marks).

2. Explain the impact of advertising and marketing on food choices among teenagers. (6 marks)

Explanation of Impact: (4 marks)

- Discussion on how advertising targets teenagers with appealing images and messages (2 marks).
- Influence of social media and celebrity endorsements (2 marks).

Examples: (2 marks)

- Specific examples of popular advertising campaigns or trends (e.g., fast food ads, snack food promotions) (1 mark each).

3. Describe the role of personal preferences in food selection. How do taste, texture, and appearance affect individual food choices? (6 marks)

Taste: (2 marks) Importance of flavour and taste preferences (e.g., sweet vs. savoury) (2 marks).

Texture: (2 marks) Impact of texture (e.g., crunchy vs. smooth) on food choice (2 marks).

Appearance: (2 marks) Role of visual appeal and presentation in food selection (2 marks).

4. Evaluate the influence of ethical considerations on food choices. Include examples such as vegetarianism, veganism, and fair trade. (8 marks)

Explanation of Ethical Considerations: (4 marks)

- Discussion on ethical issues (e.g., animal welfare, environmental sustainability) (2 marks each for two issues).

Examples: (4 marks)

- Vegetarianism/Veganism: Reasons and impacts (2 marks).
- Fair Trade: Importance and benefits (2 marks).

5. How do economic factors affect food choices? Discuss the impact of income, food prices, and availability on dietary habits. (6 marks)

Income: (2 marks) Impact of disposable income on food choices (e.g., affordability of healthy vs. processed foods) (2 marks).

Food Prices: (2 marks) Influence of price fluctuations on purchasing decisions (e.g., cost of fresh produce) (2 marks).

Availability: (2 marks) Role of accessibility to various food types (e.g., food deserts, local markets) (2 marks).

6. Analyse how health concerns and nutritional information shape food choices. Consider the role of food labels, dietary guidelines, and public health campaigns. (8 marks)

Health Concerns: (2 marks) Impact of health issues (e.g., allergies, chronic diseases) on food choices (2 marks).

Nutritional Information: (3 marks)

- Role of food labels in informing consumer choices (1 mark).
- Influence of dietary guidelines and public health campaigns (2 marks).

Examples: (3 marks)

- Specific examples of how health information affects food selection (e.g., low-sodium products, sugar-free options) (1 mark each for three examples).

7. Describe the influence of social factors on food choices, including family, peers, and social media. (6 marks)

- Family: (2 marks) Impact of family traditions and meal patterns on food choices (2 marks).

- Peers: (2 marks) Influence of peer pressure and social dining habits (2 marks).

- Social Media: (2 marks) Role of social media trends and influencers in shaping food preferences (2 marks).

Food Provenance: ANSWERS

1. Define food provenance and explain why it is important for consumers. (6 marks)

Definition: (2 marks) Clear definition of food provenance (2 marks).

Importance: (4 marks) Traceability (1 mark), quality assurance (1 mark), environmental impact (1 mark), consumer trust (1 mark).

2. Discuss the environmental impact of food production. Include topics such as greenhouse gas emissions, water usage, and land use. (8 marks)

- Greenhouse Gas Emissions: (3 marks) Impact of livestock farming, transportation, and food processing (3 marks).

- Water Usage: (3 marks) Water consumption in agriculture, irrigation methods, and water-intensive crops (3 marks).

- Land Use: (2 marks) Deforestation, soil degradation, and land for grazing vs. crop production (2 marks).

3. Explain the concept of food miles and its relevance to food provenance. How can consumers reduce their food miles? (6 marks)

- **Definition of Food Miles: (2 marks)** Explanation of the distance food travels from production to consumer (2 marks).
- **Relevance: (2 marks)** Connection to carbon footprint, freshness, and local economies (2 marks).
- **Reduction Methods: (2 marks)** Buying local, seasonal produce, supporting farmers' markets (2 marks).

4. Evaluate the benefits and challenges of organic farming practices. (8 marks)

- **Benefits: (4 marks)** Environmental sustainability (1 mark), reduced chemical use (1 mark), improved soil health (1 mark), better animal welfare (1 mark).
- **Challenges: (4 marks)** Higher costs (1 mark), lower yields (1 mark), certification processes (1 mark), limited availability (1 mark).

5. Describe the principles of Fair Trade and its significance in food production and consumption. (6 marks)

- **Principles: (3 marks)** Fair wages, safe working conditions, community development, environmental sustainability (3 marks).
- **Significance: (3 marks)** Improved livelihoods for producers (1 mark), consumer awareness (1 mark), ethical purchasing (1 mark).

6. Discuss the role of local food systems in promoting sustainability. Provide examples of how buying locally can benefit the environment and the community. (8 marks)

- **Sustainability Role: (4 marks**) Reduced food miles (1 mark), support for local farmers (1 mark), fresher produce (1 mark), decreased packaging waste (1 mark).
- **Examples: (4 marks)** Farmers' markets (1 mark), community-supported agriculture (CSA) (1 mark), local food cooperatives (1 mark), urban farming initiatives (1 mark).

7. Analyse the impact of food provenance on food quality and safety. Consider factors such as traceability, transparency, and food fraud. (8 marks)

- **Traceability: (3 marks)** Ensures source verification, accountability in supply chains (3 marks).
- **Transparency: (3 marks)** Provides information on farming practices, processing methods (3 marks).
- **Food Fraud: (2 marks)** Reduces risk of adulteration, mislabelling (2 marks).

8. How does food provenance influence consumer trust and purchasing decisions? Discuss with examples. (6 marks)

- **Influence on Trust: (3 marks)** Reliability of information, perception of quality, ethical considerations (3 marks).
- **Examples: (3 marks)** Examples like organic labels, locally sourced claims, certified humane labels (1 mark each for three examples).

Food Processing and Production: ANSWERS

Primary Processing

1. Define primary food processing and explain its importance in the food industry. (6 marks)

   Definition: Initial treatment of raw materials to make them safe and suitable for further processing or consumption (2 marks).

   Importance: Ensures safety by removing contaminants, extends shelf life, and prepares raw materials for secondary processing (4 marks).

2. Describe the primary processing steps involved in turning wheat into flour. (8 marks)

   Cleaning: Removal of dirt, stones, and other impurities (2 marks).

   Conditioning: Moistening the wheat to prepare for milling (2 marks).

   Milling: Grinding the wheat into flour, separating bran, germ, and endosperm (4 marks).

3. Explain how primary processing can affect the nutritional value of foods. Provide specific examples. (6 marks)

   Impact: Loss of nutrients through peeling, washing, and heat treatment (2 marks).

   Examples: Loss of vitamins during milling of wheat, loss of fiber when peeling fruits and vegetables (4 marks).

4. List and describe three examples of primary processing methods. (6 marks)

   Blanching: Briefly boiling vegetables to inactivate enzymes (2 marks).

   Cleaning: Removing dirt and contaminants from raw materials (2 marks).

   Drying: Removing water to prevent microbial growth (2 marks).

Secondary Processing

1. What is secondary food processing? Provide a definition and explain its role in the food industry. (6 marks)
   Definition: Conversion of primary processed foods into more complex products (2 marks).
   Role: Enhances food safety, extends shelf life, and creates a variety of food products (4 marks).

2. Describe the secondary processing steps involved in turning milk into cheese. (8 marks)
   Pasteurisation: Heating milk to kill harmful bacteria (2 marks).

   Addition of Starter Culture: Adding bacteria to ferment lactose into lactic acid (2 marks).

   Coagulation: Adding rennet to curdle the milk (2 marks).

   Cutting and Draining: Cutting the curds and draining the whey (2 marks).

3. Discuss how secondary processing alters the properties of food. Use examples to explain changes in texture, flavour, and appearance. (6 marks)

   Texture: Homogenisation of milk creates a smoother texture (2 marks).

   Flavour: Fermentation adds sourness to yogurt (2 marks).

   Appearance: Smoking meat changes its colour and appearance (2 marks).

4. Identify and describe three examples of secondary processing methods. (6 marks)

   Canning: Sealing food in airtight containers and heating to kill bacteria (2 marks).

   Fermentation: Using microorganisms to transform food (e.g., yogurt, sauerkraut) (2 marks).

   Baking: Applying dry heat to cook and brown food (e.g., bread, cakes) (2 marks).

Fortification

1. Define food fortification and explain its purpose. (6 marks)

   Definition: Addition of nutrients to foods to enhance their nutritional value (2 marks).

   Purpose: Prevents nutritional deficiencies and improves public health (4 marks).

2. List five examples of fortified foods and state the nutrients added to each. (10 marks)

   Bread: Folic acid (2 marks).

   Milk: Vitamin D (2 marks).

   Salt: Iodine (2 marks).

   Breakfast Cereals: Iron (2 marks).

   Margarine: Vitamin A (2 marks).

3. Discuss the impact of food fortification on public health, providing examples of successful fortification programs. (8 marks)
   Impact: Reduces nutrient deficiencies (2 marks).
   Examples: Folic acid fortification reducing neural tube defects (3 marks), iodine fortification preventing goiter (3 marks).

4. What are the key regulations governing food fortification in the UK? (6 marks)
   Regulations: Mandatory fortification of certain foods, labelling requirements (3 marks).
   Examples: Fortification of white and brown flour with iron, calcium, niacin, and thiamine (3 marks).

Additives

1. What are food additives? List and describe the main categories of food additives. (8 marks)

   Definition: Substances added to food to enhance its properties (2 marks).

   Categories:

   Preservatives: Prevent spoilage (2 marks).

   Colourings: Enhance appearance (2 marks).

   Flavourings: Improve taste (2 marks).

   Emulsifiers: Stabilise mixtures (2 marks).

2. Choose three types of additives and explain their functions in food products, providing specific examples. (6 marks)

   Preservatives: Sodium benzoate in soft drinks to prevent microbial growth (2 marks).

   Colourings: Caramel colouring in cola to give a brown colour (2 marks).

   Emulsifiers: Lecithin in chocolate to keep cocoa butter and sugar mixed (2 marks).

3. Discuss the potential health impacts of food additives and the measures taken to ensure their safety. (8 marks)

   Health Impacts: Allergic reactions, hyperactivity in children (4 marks).

   Safety Measures: Rigorous testing, regulatory approval (4 marks).

4. Research and identify common additives in a processed food item. Explain the role of each additive. (8 marks)

   Food Item: Example - Breakfast cereal (2 marks).

   Additives Identified:

   BHT (preservative): Extends shelf life (2 marks).

   Artificial colours: Enhance visual appeal (2 marks).

   Sweeteners: Provide sweetness without added sugar (2 marks).

Heat Treatment Methods

1. Describe the main types of heat treatment methods used in food processing. (8 marks)

   Pasteurisation: Heating to destroy pathogens (2 marks).

   Sterilisation: Heating to destroy all microorganisms (2 marks).

   Blanching: Brief heat treatment to inactivate enzymes (2 marks).

   Canning: Sealing food in airtight containers and heating (2 marks).

2. Explain the purpose and benefits of heat treatment methods in food processing. (6 marks)

   Purpose: Kill harmful microorganisms, extend shelf life (2 marks).

   Benefits: Ensures food safety, preserves nutritional quality, enhances flavour and texture (4 marks).

3. Discuss how different heat treatment methods affect the nutritional value and sensory properties of food, providing examples. (8 marks)

   Nutritional Value: Heat-sensitive vitamins like vitamin C can be lost

   (4 marks).

   Sensory Properties: Texture can become softer, flavours can be enhanced or altered (4 marks).

   Examples: Pasteurised milk retains most nutrients but loses some heat-sensitive vitamins (2 marks

4. Describe the process of pasteurisation and UHT (ultra-high temperature) treatment of milk. How do these methods differ in terms of process and end product? (8 marks)

   Pasteurisation Process: Heating milk to about 72°C for 15 seconds

   (2 marks).

   UHT Process: Heating milk to about 135°C for 2-5 seconds (2 marks).

   Differences in Process: Temperature and duration of heating (2 marks).

   Differences in End Product: Pasteurised milk has a shorter shelf life and retains more natural flavour; UHT milk has a longer shelf life and a slightly cooked taste (2 marks).