

# Sample Assessment Materials

## September 2007

**GCE Design and Technology:  
Food Technology**

**Edexcel Advanced Subsidiary GCE in Design and Technology:  
Food Technology (8FT01)**

First examination 2009

**Edexcel Advanced GCE in Design and Technology: Food  
Technology (9FT01)**

First examination 2010



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# A Introduction

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These sample assessment materials have been prepared to support the specification.

Their aim is to provide the candidates and centres with a general impression and flavour of the actual question papers and mark schemes in advance of the first operational examinations.



## B Sample question papers

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Unit 2: Design and Technology in Practice .....	7
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**Answer ALL the questions. Write your answers in the spaces provided.**

**\*1.** (a) Name **two** monosaccharides found in foods.

1 .....

2 .....

**(2)**

(b) Explain what is meant by the term 'reducing sugar'.

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**(3)**

(c) Outline what occurs in the Maillard reaction.

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**(3)**

**(Total 8 marks)**

**Q1**

2. (a) Name **two** mixing methods used for powdered food products.

1 .....

2 .....

(2)

(b) Give **two** methods of size reduction commonly used in the food industry.

1 .....

2 .....

(2)

(c) Explain **two** ways in which the processes of sorting and grading differ.

1 .....

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2 .....

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(4)

(Total 8 marks)

Q2

\*3. (a) Describe the chemical nature of simple fats.

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**(3)**

(b) Explain how a monoglyceride is formed.

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(c) Explain how a monoglyceride can act as an emulsifying agent for an emulsion of oil in water.

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**(4)**

**(Total 10 marks)**

**Q3**

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\*4. (a) Describe **two** of the four stages in the bacterial life cycle.

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**(4)**

(b) Consider how bacterial food poisoning can occur in foods.

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**(6)**

**Q4**

**(Total 10 marks)**

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**\*5.** Good manufacturing practice requires that every aspect of food manufacture is fully specified in advance.

Discuss the concept of good manufacturing practice **and** explain **three** aspects which must be specified.

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(Total 10 marks)

Q5	

\*6. (a) Assess the value of carbohydrates as stabilising agents in foods.

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**(2)**

(b) Explain what is meant by the term 'retrogradation'.

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**(3)**

(c) Describe the process of gelatinisation which occurs when a starch suspension is heated then cooled.

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**(7)**

**(Total 12 marks)**

**Q6**

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\*7. (a) Discuss the requirements which must be considered to achieve sterility in a canned food product.

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**(6)**



(b) Analyse the differences between the heat processes **and** effects of pasteurisation and sterilisation on a milk product.

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(6)

Q7

(Total 12 marks)

**TOTAL FOR PAPER: 70 MARKS**

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Answer ALL the questions. Write your answers in the spaces provided.

1. (a) Name the **two** groups of proteins found in milk.

1 .....

2 .....

(2)

(b) Explain why it is necessary to homogenise milk.

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(2)

(c) Summarise **four** of the main stages which occur when milk is made into cheese.

1 .....

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2 .....

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3 .....

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4 .....

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(4)

(Total 8 marks)

Q1

2. (a) Describe the process of encapsulation used in the food industry.

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(4)

(b) Assess the value of the genetic modification of food crops to the producer and the manufacturer.

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(4)

**(Total 8 marks)**

Q2

\*3. (a) Explain **two** differences that occur during the ripening of climacteric fruits with those of non-climacteric fruits.

1 .....  
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2 .....  
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(4)

(b) Explain **three** factors which influence the ripening of fruit during storage.

1 .....  
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2 .....  
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3 .....  
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(6)

Q3

(Total 10 marks)

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\*4. (a) Describe the function that both iron and calcium make to the UK diet.

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**(6)**

(b) Describe the effect that a deficiency in both iron and calcium has on the UK diet.

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**(2)**

**(Total 8 marks)**

**Q4**

\*5. (a) (i) Describe the structural composition of fish.

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**(3)**

(ii) Describe the structural composition of meat.

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**(3)**

(b) Compare and contrast the nutritional composition of fish and meat.

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**(6)**

**(Total 12 marks)**

**Q5**

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**PLEASE TURN OVER FOR QUESTION 6**

\*6. Here are two packed lunches:

Component	Packed lunch 1	Packed lunch 2
Drink	Fizzy drink	Orange juice
Sandwich	Chocolate spread on white bread	Salad(lettuce,tomato,cucumber) sandwich on wholemeal bread
Dessert	Strawberry flavoured mousse	yoghurt

Packed lunch 2 is considered by most people to be the healthier of the two packed lunches.

Analyse **two** of the three components (drinks, sandwiches, desserts) in both packed lunches in detail and assess the extent to which you think this is true.

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Q6

(Total 12 marks)

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Q7

**(Total 12 marks)**

**TOTAL FOR PAPER: 70 MARKS**

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## C Sample mark schemes

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## General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- Mark schemes will indicate within the table where, and which strands of QWC, are being assessed. The strands are as follows:
  - i) ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear
  - ii) select and use a form and style of writing appropriate to purpose and to complex subject matter
  - iii) organise information clearly and coherently, using specialist vocabulary when appropriate



# Food Technology

## Unit 2: Design and Technology in Practice

Question Number	Question	
1. (a)	Name <b>two</b> monosaccharides found in foods.	
	Answer	Mark
	The following examples: <ul style="list-style-type: none"> <li>• Glucose (1)</li> <li>• Fructose (1)</li> </ul> <i>Only answers</i>	<b>(2)</b>

Question Number	Question	
1. (b)	Explain what is meant by the term 'reducing sugar'.	
	Answer	Mark
	An explanation that makes reference to the following: <ul style="list-style-type: none"> <li>• A sugar which contains a reducing group / potential aldehyde group / CHO (1) can breakdown Fehling's solution (1) to produce a brick-red precipitate (1)</li> </ul>	<b>(3)</b>

Question Number	Question	
1. (c)	Outline what occurs in the Maillard reaction.	
	Answer	Mark
QWC (iii)	An answer that makes reference to the following: <ul style="list-style-type: none"> <li>• Reducing sugar / CHO group (1) reacts with protein or amino acid / NH<sub>2</sub> (1) to produce brown pigment (1)</li> </ul>	<b>(3)</b>

Question Number	Question	
2. (a)	Name two mixing methods used for powdered food products.	
	Answer	Mark
	<p>The following examples:</p> <ul style="list-style-type: none"> <li>• Tumbler mixer (1)</li> <li>• Ribbon blender (1)</li> </ul> <p><i>Only answers</i></p>	<b>(2)</b>

Question Number	Question	
2. (b)	Give two methods of size reduction commonly used in the food industry.	
	Answer	Mark
	<p>Any <b>two</b> of the following examples from:</p> <ul style="list-style-type: none"> <li>• Pulping (1)</li> <li>• Slicing (1)</li> <li>• Dicing (1)</li> <li>• Milling (1)</li> <li>• Grinding (1)</li> <li>• Shredding (1)</li> <li>• Chopping (1)</li> </ul> <p><i>Only answers</i></p>	<b>(2)</b>

Question Number	Question	
2. (c)	Explain <b>two</b> ways in which the processes of sorting and grading differ.	
	Answer	Mark
	<p>Any <b>two</b> of the following examples from:</p> <ul style="list-style-type: none"> <li>• Sorting is separation by one physical characteristic (1) such as weight or colour (1)</li> <li>• Grading is separation by quality (1) many factors considered (such as ripeness, freedom from blemish, size or shape.) (1)</li> </ul>	<b>(4)</b>

Question Number	Question	
3. (a)	Describe the chemical nature of simple fats.	
	Answer	Mark
QWC (iii)	<p>A description that makes reference to the following:</p> <ul style="list-style-type: none"> <li>Simple fats are mixtures (1) of mixed (1) triglycerides (1)</li> </ul> <p><i>(words mixtures, mixed and triglycerides must be mentioned no other definition acceptable)</i></p>	(3)

Question Number	Question	
3. (b)	Explain how a monoglyceride is formed.	
	Answer	Mark
QWC (iii)	<p>An explanation that makes reference to the following:</p> <p>A monoglyceride is:</p> <ul style="list-style-type: none"> <li>Glycerol combined with (1) one fatty acid (1) with two free OH (hydroxyl) groups (1)</li> </ul>	(3)

Question Number	Question	
3. (c)	Explain how a monoglyceride can act as an emulsifying agent for an emulsion of oil in water.	
	Answer	Mark
QWC (iii)	<p>An explanation that makes reference to the following:</p> <ul style="list-style-type: none"> <li>The monoglyceride orientates itself (1) on the water or oil interface (1) Part dissolves in the oil, (the fatty acid) (accept fat-loving or lyophilic or lipophilic) (1). Part dissolves in the water, (hydroxyl or OH groups) (accept water-loving or hydrophilic) (1)</li> </ul>	(4)

Question Number	Question	
4. (a)	Describe <b>two</b> of the four stages in the bacterial life cycle.	
	Answer	Mark
QWC (iii)	<p>Any <b>two</b> of the following examples from:</p> <ul style="list-style-type: none"> <li>• Lag phase - bacterial growth is slow (1) due to bacteria establishing themselves in food medium (1)</li> <li>• Log phase - rapid multiplication of bacteria (1) every 10 - 20 minutes by binary fission (1)</li> <li>• Stationary phase - growth of bacteria is at a constant / no more growth (1) due to depletion of nutrients in food medium (1)</li> <li>• Death phase - numbers of bacteria decline (1) due to death of bacteria (1)</li> </ul> <p><i>No marks for mentioning the actual stage.</i></p>	<b>(4)</b>

Question Number	Question	
4. (b)	Consider how bacterial food poisoning can occur in foods.	
	Answer	Mark
QWC (iii)	<p>A consideration that makes reference to six of the following examples:</p> <ul style="list-style-type: none"> <li>• Poor kitchen hygiene - cross - contamination from equipment / utensils / work environment / pests (1)</li> <li>• Poor food hygiene - incorrect heating / reheating of food - poor storage / cooking / handling of food (1)</li> <li>• Poor personal hygiene - not washing hands after using the toilet / or handling raw materials - not reporting illness - picking nose / spots / skin - sneezing over food - wearing jewellery / dirty overalls / not covering hair (1)</li> <li>• Poor food / kitchen / personal hygiene can lead to food becoming contaminated with food-poisoning organisms (1)</li> <li>• Growth conditions must allow bacteria to multiply and include the following factors: time / temperature / oxygen / pH / nutrition / moisture (1)</li> <li>• Growth conditions must be controlled to prevent outbreaks of food poisoning and include good food / kitchen / personal hygiene training</li> <li>• Time essential in allowing for both toxin and infective type organisms to produce toxin / reach critical numbers (1)</li> <li>• Staff not trained correctly in preventative measures (1)</li> <li>• Failure to comply could result in an outbreak of food poisoning / severe illness leading to permanent disability even death / prosecution / lose of business / profits / reputation.</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	<b>(6)</b>



Question Number	Question	
5.	Discuss the concept of good manufacturing practice <b>and</b> explain <b>three</b> aspects which must be specified.	
	Answer	Mark
QWC (iii)	<p>Any <b>four</b> of the following examples from:</p> <p><b>Concept of GMP (4 marks)</b></p> <ul style="list-style-type: none"> <li>• GMP concept is concerned with both the manufacturing aspects (1) as well as the quality assurance procedures of food manufacture (1)</li> <li>• There is a requirement for all food manufacturers to comply with relevant legislation (1) relating to hygiene, composition and labelling (1)</li> <li>• HACCP and hygiene practices are paramount as quality aspects such as appearance, texture, flavour, image, price, etc, (1) along with the legal requirements that need to be considered within the scope of GMP (1)</li> <li>• GMP embraces two aspects of quality: audit assurance (1) and manufacturing procedures (1)</li> <li>• Failure to comply could result in prosecution / loss of profits / closure of premises / lost of business / reputation / severe outbreak of food poisoning (1)</li> </ul> <p>Any <b>three</b> of the following examples from:</p> <p><b>Aspects (6 marks)</b></p> <ul style="list-style-type: none"> <li>• Measures, precautions and manufacturing process (1) are based on hazard analysis at critical control points / HACCP (1)</li> <li>• Adequate (1) and appropriate use of premises / labs and sufficient space (1)</li> <li>• Correct processing equipment (1) properly maintained (1)</li> <li>• Correct raw materials (1) and properly packaged (1)</li> <li>• Appropriate storage (1) and proper transportation facilities (1)</li> <li>• Appropriate (1) correctly trained staff (1)</li> <li>• Written operational procedures (1) which should include cleaning/making schedules (1)</li> <li>• Appropriate management (1) and correct supervision (1)</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	<b>(10)</b>

Question Number	Question	
6. (a)	Assess the value of carbohydrates as stabilising agents in foods.	
	Answer	Mark
QWC (iii)	Any <b>two</b> examples from: <ul style="list-style-type: none"> <li>• absorb / bind up / and hold / large quantities of water (1)</li> <li>• prevent retrogradation / syneresis (1)</li> </ul>	(2)

Question Number	Question	
6. (b)	Explain what is meant by the term 'retrogradation'.	
	Answer	Mark
QWC (iii)	An explanation that makes reference to the following: <ul style="list-style-type: none"> <li>• Refers to the process in gels which is the opposite of gelatinisation (1) the gel contracts (1) liquid is eliminated / the latter may be referred to as syneresis (1)</li> </ul>	(3)

Question Number	Question	
6. (c)	Describe the process of gelatinisation which occurs when a starch suspension is heated then cooled.	
	Answer	Mark
QWC (iii)	A description that makes reference to the following: <ul style="list-style-type: none"> <li>• Starch takes up water as temperature rises (1)</li> <li>• At around 60C granules swell rapidly (1)</li> <li>• More water absorbed (1)</li> <li>• Starch granules begin to split (1)</li> <li>• Starch molecules released from granules (1)</li> <li>• Viscosity of suspension increases noticeably / importance of hydrogen bonding (1)</li> <li>• Becomes solid on cooling / importance of hydrogen bonding (1)</li> </ul>	(7)

Question Number	Question	
7. (a)	Discuss the requirements which must be considered to achieve sterility in a canned food product.	
	Answer	Mark
QWC (iii)	<p>A discussion that makes reference to any <b>six</b> of the following examples:</p> <ul style="list-style-type: none"> <li>• Nature or product determines rate of heat penetration, as liquid / solid / size of pieces affect sterilisation temperature and holding time(1)</li> <li>• Liquid products heat up more quickly by convection, so require a shorter holding time (1)</li> <li>• Solid products heat up more slowly by conduction, so require a longer holding time (1)</li> <li>• Coldest part in can (known as the cold point) must be used as reference e.g. cold point must reach correct temperature to ensure all contents have reached sterilisation temperature (1)</li> <li>• 12D process ensures that bacterial population is acceptable, to reduce risk of food poisoning (1)</li> <li>• At a minimum Clostridium botulinum must be destroyed, as it is a lethal poison and the spores may survive the heat process, therefore used as an indicator organism (1)</li> <li>• No air pockets in retorts, as temperature will not be reached / no air in the can, as this can be used for bacterial growth and blowing of cans (1)</li> <li>• Any defects in seam can result in water being drawn into the can, which can result in bacterial growth.</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	<b>(6)</b>

Question Number	Question	
7. (b)	Analyse the differences between the heat processes and effects of pasteurisation and sterilisation on a milk product.	
	Answer	Mark
QWC (iii)	<p>Answer must include both heat processes and effects for maximum marks.</p> <p><b>Processing (4 marks)</b></p> <ul style="list-style-type: none"> <li>• Pasteurisation is a short heat process - held at holding temperature for 15 - 25 seconds and sterilisation is long heat process - held at holding temperature for 15 minutes (1)</li> <li>• Pasteurisation at low temperature 72 °C and sterilisation is at high temperature 121 °C-132 °C (1)</li> <li>• Pasteurisation is used to destroy pathogens / food poisoning bacteria but not food spoilage bacteria and sterilisation destroys all bacterial cells / destroys both food poisoning and food spoilage bacteria (1)</li> <li>• Pasteurisation produces a short shelf life - 7/10 days and Sterilisation produces a long shelf life - 6 months (1)</li> </ul> <p><b>Effects (2 marks)</b></p> <ul style="list-style-type: none"> <li>• Pasteurisation does not affect the flavour but some lose of vitamin B1 and C and sterilisation affects the flavour {caramel taste - due to cooking of the lactose (sugar)} and a significant lose of vitamin B1 and C. (1)</li> <li>• Pasteurised products require chilling and sterilised products do not require chilling, can be stored in ambient temperatures - but does require chilling upon opening (1)</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	(6)

# Food Technology

## Unit 3: Food Products, Nutrition and Product Development

Question Number	Question	
1. (a)	Name the <b>two</b> groups of proteins found in milk.	
	Answer	Mark
	The following examples: <ul style="list-style-type: none"> <li>• Caseins (1)</li> <li>• Whey proteins (1)</li> </ul> <i>Only answers</i>	<b>(2)</b>

Question Number	Question	
1. (b)	Explain why it is necessary to homogenise milk.	
	Answer	Mark
	An explanation that makes reference to the following: <ul style="list-style-type: none"> <li>• To prevent separation of fat during storage (1) by reducing the size of the fat globules (1)</li> </ul> <i>For maximum marks both the lead-in and justification must be present and linked. Each bullet point indicates a single answer containing two linked points.</i>	<b>(2)</b>

Question Number	Question	
1. (c)	Summarise <b>four</b> of the main stages which occur when milk is made into cheese.	
	Answer	Mark
	An answer that makes reference to <b>four</b> of the following: <ul style="list-style-type: none"> <li>• Bacterial starter culture added (1)</li> <li>• Acidity develops (pH falls) (1)</li> <li>• Rennet added to coagulate proteins (1)</li> <li>• Curd formed (1)</li> <li>• Whey drains from curd (1)</li> <li>• Curd ripened (1)</li> </ul>	<b>(4)</b>

Question Number	Question	
2. (a)	Describe the process of encapsulation used in the food industry.	
	Answer	Mark
	<p>A description that makes reference to:</p> <ul style="list-style-type: none"> <li>• Ingredients or additives are encased in an edible layer (1)</li> <li>• in the form of small particles (1)</li> <li>• to make a free-flowing powder (1)</li> <li>• which releases the ingredient later in the processing of the food (1)</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	<b>(4)</b>

Question Number	Question	
2. (b)	Assess the value of the genetic modification of food crops to the producer and the manufacturer.	
	Answer	Mark
	<p>Answer must include reference to both producer and manufacturer for maximum marks.</p> <p>Maximum 3 marks if only producer or only manufacturer addressed.</p> <p><b>Producer</b> (up to 3 marks):</p> <ul style="list-style-type: none"> <li>• Reduced use of chemicals during growth (1)</li> <li>• Greater ability for crops to grow in hostile surroundings (1)</li> <li>• Better crop yields (1)</li> <li>• Quick compared with conventional methods such as plant breeding (1)</li> </ul> <p><b>Manufacture</b> (up to 3 marks):</p> <ul style="list-style-type: none"> <li>• Improved sensory characteristics (1)</li> <li>• Improved nutritional characteristics (1)</li> <li>• Reduced wastage during processing (1)</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	<b>(4)</b>

Question Number	Question	
3. (a)	Explain <b>two</b> differences that occur during the ripening of climacteric fruits with those of non-climacteric fruits.	
	Answer	Mark
QWC (iii)	<p>Any two of the following examples from:</p> <ul style="list-style-type: none"> <li>• Climacteric fruits show rapid rise in respiration rate after harvesting (1) whereas non climacteric fruits show gradual change (1)</li> <li>• Climacteric fruits show rapid ripening followed by spoilage (1) whereas non climacteric fruits have long keeping qualities (1)</li> </ul> <p><i>For maximum marks both the lead-in and justification must be present and linked. Each bullet point indicates a single answer containing two linked points.</i></p>	(4)

Question Number	Question	
3. (b)	Explain <b>three</b> factors which influence the ripening of fruit during storage.	
	Answer	Mark
QWC (iii)	<p>Any <b>three</b> of the following examples from:</p> <ul style="list-style-type: none"> <li>• Starches (1) are converted to sugar (1)</li> <li>• High temperatures (1) leads to rapid ripening (1)</li> <li>• Oxygen must be sufficient (1) or fruit ferments (1)</li> <li>• Ethylene (also known as ethene) (1) stimulates ripening (1)</li> <li>• Low atmospheric pressure (1) depresses ripening (1)</li> </ul> <p><i>For maximum marks both the lead-in and justification must be present and linked. Each bullet point indicates a single answer containing two linked points.</i></p>	(6)

Question Number	Question	
4. (a)	Describe the function that both iron and calcium make to the UK diet.	
	Answer	Mark
QWC (iii)	<p>Answer must include both iron and calcium for maximum marks.</p> <p>Maximum 4 marks if only iron or only calcium addressed.</p> <p><b>Iron</b> (up to 4 marks):</p> <ul style="list-style-type: none"> <li>• Iron: essential constituent of haemoglobin (blood pigments) to allow oxygen transportation from the lungs to the cells of all body tissues. (1)</li> <li>• Iron: found in myoglobin, a protein that acts as an oxygen carrier in the muscles. (1)</li> <li>• Iron: present in all body cells, where it is involved in various enzyme systems. (1)</li> <li>• Vitamin C assists with function of Iron (1)</li> </ul> <p><b>Calcium</b> (up to 4 marks):</p> <ul style="list-style-type: none"> <li>• Calcium: formation and development of bones and teeth (1)</li> <li>• Calcium: essential factor for the clotting of blood (1)</li> <li>• Calcium: necessary for the normal functioning of muscles and nerves in the body (1)</li> <li>• Vitamin D assists with function of Calcium (1)</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	(6)

4. (b)	Describe the effect that a deficiency in both iron and calcium has on the UK diet.	
	Answer	Mark
QWC (iii)	<p>Answer must include both iron and calcium for maximum marks.</p> <p>Maximum 1 mark if only iron or only calcium addressed.</p> <p><b>Iron</b> (up to 1 mark):</p> <ul style="list-style-type: none"> <li>• If bodies store of iron is depleted then the amount of haemoglobin in the blood will fall below normal levels resulting in anaemia (1)</li> </ul> <p><b>Calcium</b> (up to 1 mark):</p> <ul style="list-style-type: none"> <li>• Calcium deficiency leads to calcium being taken from the bones which leads to decalcification, this results in rickets in children and osteomalacia / osteoporosis in adults (1)</li> </ul>	(2)



Question Number	Question	
5. (a) (i)	Describe the structural composition of fish.	
	Answer	Mark
	<p>Any description that makes reference to <b>three</b> of the following:</p> <ul style="list-style-type: none"> <li>• composed of blocks of short fibres (myotomes) (1)</li> <li>• myotomes are separated by thin sheets of connective tissue (1)</li> <li>• fat contained in the liver of white fish / distributed throughout flesh in oily fish</li> <li>• tenderness indicative of length of fibres, short blocks of fibres (myotomes) result in tender, flaky flesh</li> <li>•</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	<b>(3)</b>

Question Number	Question	
5. (a)(ii)	Describe the structural composition of meat.	
	Answer	Mark
	<p>Any description that makes reference to <b>three</b> of the following:</p> <ul style="list-style-type: none"> <li>• composed of microscopic fibres of varying length (1)</li> <li>• fibres held together by connective tissue to form bundles (1)</li> <li>• the whole muscle is surrounded by connective tissue (1)</li> <li>• fatty deposits (marbling) and blood vessels are found between bundles of fibres (1)</li> <li>• length of fibre indicative of tenderness of meat / longer fibres = tough / shorter fibres = tender (1)</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	<b>(3)</b>

Question Number	Question	
5. (b)	Compare and contrast the nutritional composition of fish and meat.	
	Answer	Mark
QWC (iii)	<p>Answer must include both compare and contrasts for maximum marks.</p> <p>Maximum 3 marks if only compare or only contrasts addressed.</p> <p>Comparison of fish and meat (up to 3 marks)</p> <ul style="list-style-type: none"> <li>• H.B.V. protein (1)</li> <li>• No carbohydrate (1)</li> <li>• Good source of B vitamins (1)</li> </ul> <p>Contrasts of fish and meat (up to 3 marks)</p> <ul style="list-style-type: none"> <li>• Fish is low in cholesterol - depending on the meat, meat is high in cholesterol (1)</li> <li>• Oily fish good source of Vitamins A and D where meat isn't (1)</li> <li>• Fish has high water content whilst meat has a low level content (1)</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	<b>(6)</b>

Question Number	Question													
6.	<p>Here are two packed lunches:</p> <table border="1" data-bbox="440 353 1166 819"> <thead> <tr> <th>Component</th> <th>Packed lunch 1</th> <th>Packed lunch 2</th> </tr> </thead> <tbody> <tr> <td>Drink</td> <td>Fizzy drink</td> <td>Orange juice</td> </tr> <tr> <td>Sandwich</td> <td>Chocolate spread on white bread</td> <td>Salad (lettuce, tomato, cucumber) sandwich on buttered wholemeal bread</td> </tr> <tr> <td>Dessert</td> <td>Strawberry flavoured mousse</td> <td>Yoghurt</td> </tr> </tbody> </table> <p>Packed lunch 2 is considered by most people to be the healthier of the two packed lunches.</p> <p>Analyse <b>two</b> of the three components (drinks, sandwiches, desserts) in both packed lunches in detail and assess the extent to which you think this is true.</p>	Component	Packed lunch 1	Packed lunch 2	Drink	Fizzy drink	Orange juice	Sandwich	Chocolate spread on white bread	Salad (lettuce, tomato, cucumber) sandwich on buttered wholemeal bread	Dessert	Strawberry flavoured mousse	Yoghurt	
Component	Packed lunch 1	Packed lunch 2												
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Dessert	Strawberry flavoured mousse	Yoghurt												
	Answer	Mark												
QWC (iii)	<p>Answer must address two components (drinks, sandwiches, desserts) in both packed lunches.</p> <p>Must include at least one advantage and one disadvantage for each component in both packed lunches for maximum marks.</p> <p>Opposite arguments cannot gain credit twice.</p> <p>Maximum 6 marks per comparison – eg two advantages and one disadvantage or one advantage and two disadvantages</p> <p><b>DRINKS</b> (Up to 6 marks)</p> <p><b>Fizzy drink:</b></p> <p>Advantages:</p> <ul style="list-style-type: none"> <li>• high in sugar which provides a quick energy boost as blood sugar levels are increased (1)</li> <li>• good at replacing lost energy quickly after a sports activity / feeling faint / diabetic (1)</li> </ul> <p>Disadvantages:</p> <ul style="list-style-type: none"> <li>• high GI level peaks quickly and needs replenishing (1)</li> <li>• approximately 12 teaspoons of sugar in 320ml can of drink making product high in calories (1)</li> <li>• usually high in additives such as colourings which can lead to hyperactivity (1).</li> </ul>													

### **Orange juice**

#### **Advantages:**

- depending on source e.g. pure, concentrate, fresh, will influence nutritional status. Can be high in Vitamin C (1)
- usually lower in sugar / additives making it a healthier choice (1)
- can help with weight loss if taken as part of a calories controlled diet (1)

#### **Disadvantages:**

- some orange juices can be high in sugar / additives and in some cases be as unhealthy as fizzy drinks (1)
- careful reading of labels is essential in order to ascertain how healthy a product is (1)

### **SANDWICHES (Up to 6 marks)**

#### **Chocolate spread on white bread**

#### **Advantages:**

- white bread is a cheap source of energy provided from the starch (1)
- it is fortified with B group vitamins and the minerals iron and calcium (1).

#### **Disadvantages:**

- refined starch product which can cause bloating / digestion problems (1)
- chocolate spread is high in both saturated fat and sugar (1)
- over consumption of hidden fats / sugars can lead to weight gain (1)

#### **Salad sandwich on wholemeal bread**

#### **Advantages:**

- high in fibre as bran which was removed during milling process is put back into white flour (1)
- excellent way to increase fibre in the diet as it can prevent digestion problems (1)
- salad (lettuce, tomato and cucumber) high in vitamins: vitamin C, K and folate (1)
- salad high in the following minerals: calcium. Potassium and magnesium (1)
- use of butter or margarine will provide Vitamin A essential for healthy skin, retina, mucus membranes (1)
- Vitamin D essential for the formation of strong bones and teeth (1)

	<p>Disadvantages:</p> <ul style="list-style-type: none"> <li>• does not contain a good source of high biological value protein as no animal produce has been used (1)</li> </ul> <p><b>DESSERTS (Up to 6 marks)</b></p> <p><b>Strawberry flavoured mousse</b></p> <p>Advantages:</p> <ul style="list-style-type: none"> <li>• high GI product, due to high sugar content (1)</li> <li>• can increase blood glucose levels and replace lost energy quickly (1)</li> </ul> <p>Disadvantages:</p> <ul style="list-style-type: none"> <li>• as it is strawberry flavoured this means that no fresh strawberries have been used in the product (1)</li> <li>• high in sugar which body uses up quickly and leads to hunger prangs quicker (1),</li> <li>• will contain a high level of additives: colours/ flavours/acidity regulators/stabilisers/setting agents(1)</li> </ul> <p><b>Yoghurt</b></p> <p>Advantages:</p> <ul style="list-style-type: none"> <li>• high in calcium as it is a milk product (1)</li> <li>• calcium is necessary for strong bones and teeth / blood clotting / muscle contraction / nerve activity (1).</li> <li>• high biological value protein due to milk content (1)</li> <li>• if full fat milk has been used yoghurt will contain Vitamin A essential for healthy skin /retina / mucus membranes / nerve endings (1)</li> <li>• Vitamin D essential for the formation of strong bones and teeth. (1)</li> <li>• vitamin D and calcium work together to help with the correct formation and strength of bones and teeth (1).</li> </ul> <p>Disadvantages:</p> <ul style="list-style-type: none"> <li>• if low fat, can lead to a deficiency of vitamin A / D if not sourced from other foods/drinks (1).</li> <li>• depending on type, can be high in sugar to improve taste as yoghurt is acidic (1).</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	(12)
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Question Number	Question	
7.	Consider how <b>two</b> changes in the technological development of food materials have influenced the generation of new food product ideas.	
	Answer	Mark
QWC (iii)	<p>Answer must include <b>two</b> technological changes for maximum marks.</p> <p>Maximum 6 marks if only <b>one</b> technological change addressed.</p> <p>Technological development of food materials (known as modern/novel/smart materials) - any two of the following (3 marks for discussing the change and 3 marks for the influence):</p> <ul style="list-style-type: none"> <li>• Man-made (up to 6 marks): where materials or ingredients have undergone changes that are not naturally occurring (1); eg modified starches are native starches that have been chemically modified (not GM) to produce a specific function in a food product, that would otherwise not occur eg prevent syneresis (1); pre-gelatinised: used as an instant thickener in instant desserts/gravies (1); stabilised: used as a suspension agent in cup-a-soups, ready made mousses (1); cross-linked: used in canned products to delay thickening (1); acid modified: used to make soft jellies, jelly babies (1); oxidised: used to make harder jellies, wine gums (1)</li> <li>• Functional (up to 6 marks): where foods or their ingredients have a physiological beneficial action (1) that goes beyond that of normal nutrition (1); nutraceuticals / pre/pro-biotics / bifido-bacteria / plant stanols / omega 3 (1); these functional ingredients offer a range of benefits eg improve digestion/reduce cholesterol (1); benecol / actimel/pro-active (1); products have been proven scientifically to provide benefits ie can make medical claim in advertising (1).</li> <li>• Novel function (up to 6 marks): foods that perform a specific function, not conventionally achieved in standard foods (1) eg fat replacers/ sweeteners/stabilisers/gums/emulsifiers/acidulants/gelling agents (1); these novel functional ingredients produce changes that would be difficult to maintain naturally (1) such as: physical (texture modifier)/nutritional (added calcium)/sensory (colour): processing aid (anti-caking agent)/storage (citric acid) (1); extensive use in the food industry as products must behave in a required/specified way to be successful (1); essential in perception quality analysis by consumer (1).</li> <li>• Specially developed (up to 6 marks): ingredients for a specific use, often by the adaptation of natural food by human intervention (1), which over time have become available for general use (1) eg meat analogues: Quorn/tofu/soy (1); meat replacing ingredients suitable for vegetarians (1); better nutrition as lower in fat/good source of H.B.V. protein (1); used to bulk out cheaper meat/value line dishes eg cottage pie (1)</li> </ul>	

	<ul style="list-style-type: none"> <li>• Foods with a memory (up to 6 marks): materials that often respond to the differences in the conditions around them such as temperature, pH or light (1); these conditions cause the foods to change in some way and sometimes foods can revert back to their original form (1) <b>Encapsulates:</b> technically an example of new technology in food ingredient <b>processing</b> but is classified with new food ingredients because of its function (1); known as intelligent ingredients (1); they incorporate active ingredients which are protected by a capsule (1); when conditions are favourable they release the active ingredient (1).</li> <li>• GM foods (up to 6 marks): using ingredients that have been genetically engineered / changing of DNA (1); highly selective and precise (1); ingredients changed to perform a particular function eg contain a vitamin (1); issues / concerns as to the long term use of GM products as not round long enough to allow for scientific study (1); beneficial to producers / manufacturers as ingredients are manipulated eg increase yield, pest resistant, less waste, etc (1); labelling on food product must state by law that GM ingredients have been used. (1)</li> <li>• Bio-technology (up to 6 marks): modern (1); chymosin an enzyme that behaves like rennin (cheese making) but has been produced from a genetically modified source (1) but is not a GM food (1); Xanthan gum produced by the bacterium <i>Xanthomonas campestris</i> (1) used for a range of functions eg stabiliser/thixotropic (1); can produce rapid flavour release (1); used in sauces, toppings, dressings and sweets (1)</li> </ul> <p>Answers are indicative of the responses expected of candidates. They are not exhaustive so apply professional judgement to interpret if candidate's response is appropriate, using the indicative answers as a guide.</p>	(12)
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