

General Certificate of Secondary Education

A522

**Design and Technology:
Food Technology**

Unit A522 Sustainable Design

Specimen Paper

Time: 1 hour

Candidates answer on the question paper.

Additional materials:

Candidate
Forename

Candidate
Surname

Centre
Number

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Candidate
Number

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INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do not write in the bar codes.
- Do not write outside the box bordering each page.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [] at the end of each question or part question.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is 60.

FOR EXAMINER'S USE

1		7		13	
2		8		14	
3		9		15	
4		10		16	
5		11		17	
6		12		18	
TOTAL					

This document consists of **9** printed pages and **3** blank pages.

Section A

Answer **all** questions.

1 This symbol stands for:



- (a) Store in a bin
- (b) Do not burn
- (c) Recycling symbol
- (d) Put in litter bin

[1]

2 Name the food which is compostable:

- (a) plastic
- (b) raw meat
- (c) raw carrots
- (d) cooked meat

[1]

3 Which of the following can be produced free range

- (a) carrots
- (b) eggs
- (c) tinned tomatoes
- (d) apples

[1]

4 Biodegradable means that it can:

- (a) grow naturally in the environment
- (b) naturally rot in the environment
- (c) be reusable as a different product
- (d) not grow naturally in the environment

[1]

5 The role of a designer of sustainable products is to:

- (a) create innovative sustainable designs
- (b) modify existing designs
- (c) use traditional designs
- (d) design products that can be bought cheaply

[1]

6 In the space below draw the symbol that would be found on a product that can be recycled.

[1]

- 7 The term recycling means to a product. [1]
- 8 State what is meant by a product being 'Fair trade'
..... [1]
- 9 What do the initials GM stand for?
..... [1]
- 10 State the name of a packaging material that is not biodegradable.
..... [1]

Decide whether each of the following statements is **true** or **false**.

- | | True | False | |
|---|--------------------------|--------------------------|-----|
| 11 Smart materials are materials whose properties can change due to changes in temperature. | <input type="checkbox"/> | <input type="checkbox"/> | [1] |
| 12 A renewable source is one that cannot be renewed within 50 years. | <input type="checkbox"/> | <input type="checkbox"/> | [1] |
| 13 Preservatives are added to foods to make the shelf life shorter | <input type="checkbox"/> | <input type="checkbox"/> | [1] |
| 14 Job production is used to make large batches of products. | <input type="checkbox"/> | <input type="checkbox"/> | [1] |
| 15 Ethical trading is a term used to show that the basic rights of the employees are protected. | <input type="checkbox"/> | <input type="checkbox"/> | [1] |

Section A Total [15]

Section B

When designing new products manufacturers have to consider many factors.

16 (a) Explain how manufacturers consider the following when developing new products.

(i) Market research:

.....
.....
.....
..... [2]

(ii) Product Development:

.....
.....
.....
..... [2]

(iii) Functionality:

.....
.....
.....
..... [2]

(iv) Safety:

.....
.....
.....
..... [2]

(v) Aesthetics:

.....
.....
.....
..... [2]

A manufacturer wishes to develop a range of organic food products to be sold in a supermarket.

(b) List **three** organic fruits or vegetables that could be used in a product.

- 1
- 2
- 3 **[3]**

(c) Give **two** reasons why consumers choose to purchase organic food.

- 1
-
- 2
- **[2]**

Total [15]

SPECIMEN

17 (a) Design a new product using some organic fruit or vegetables on your list in question 1b that meets the following specification:

- Appeals to children
- Suitable to go in a Packed lunch
- Contains calcium
- Uses raw fruit and or vegetables

Use sketches and notes, as appropriate, to show your initial ideas for your chosen product. Do not draw the packaging.

SPECIMEN

(b) Use notes and sketches to develop **one** of your initial ideas.

[5]

(c) With reference to the 6Rs select and describe **two** ways in which the packaging for your product could address **two** of these issues.

1 [2]

.....

.....

.....

.....

2 [2]

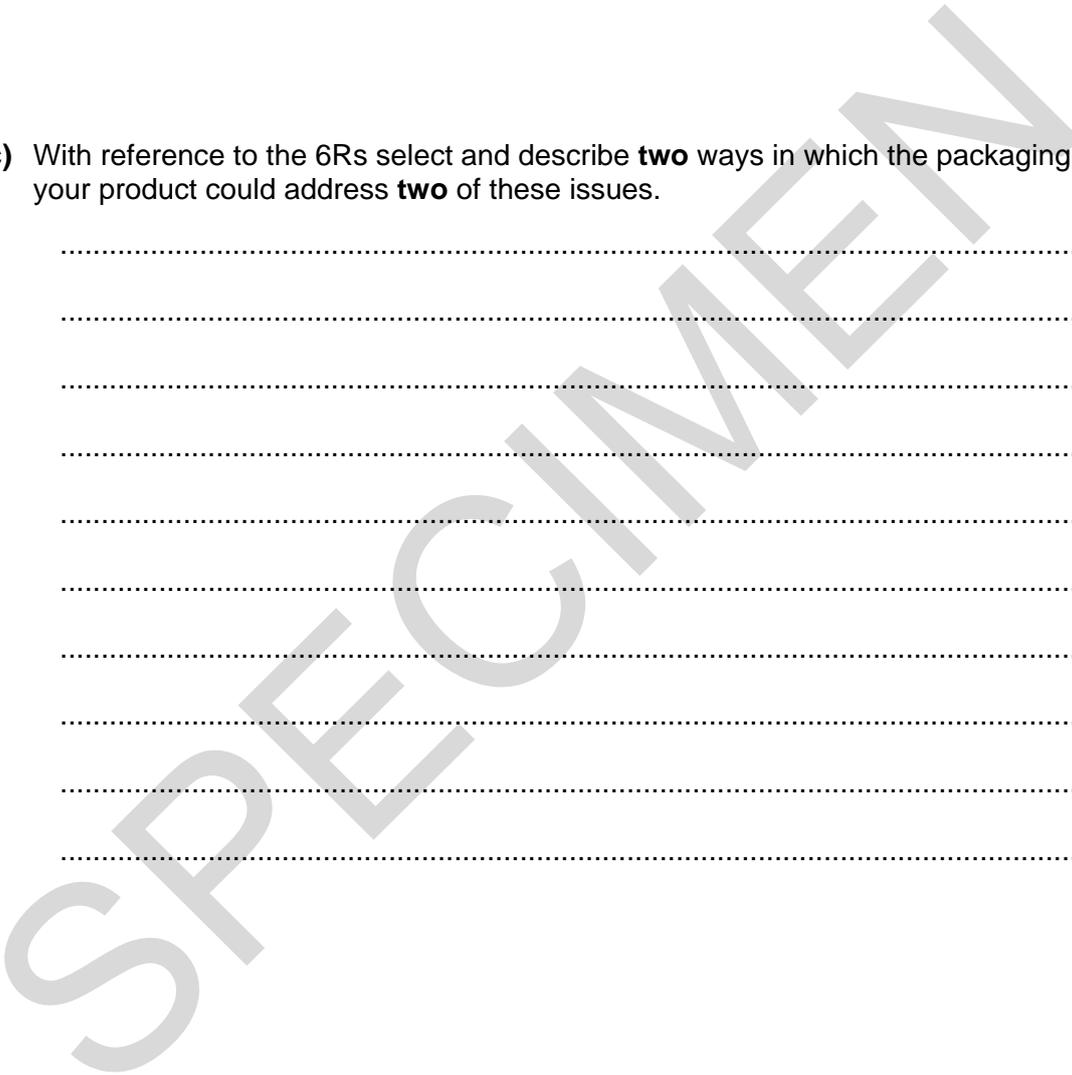
.....

.....

.....

.....

Total [15]



18(a) (i) Give a suitable technique/method of making your product.

..... [1]

(ii) Describe **four** stages relevant to this technique/method.

1 [1]
.....

2 [1]
.....

3 [1]
.....

4 [1]
.....

(b) Name a piece of equipment that would be needed for your technique/method.

..... [1]

(c) Give **two** safety precautions that should be taken into account when using tools and equipment.

1 [1]
.....

2 [1]
.....

SPECIMEN

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SPECIMEN

Section A		
Question Number	Answer	Max Mark
1	This symbol stands for: D	[1]
2	The food which is compostable is: C	[1]
3	Which of the following can be produced free range? B	[1]
4	Biodegradable means that it can: B	[1]
5	The role of a designer of sustainable products is to: A	[1]
6	In the space below draw the symbol that would be found on a product that can be recycled. 	[1]
	Accept variations of this symbol – e.g. without the shading	[1]
7	The term recycling means to a product. re-use	[1]
8	State what is meant by a product being 'Fair trade' fair wages for the workers in less economically developed countries (LEDC's)	[1]
9	What do the initials GM stand for? genetically modified	[1]
10	State the name of a packaging material that is not biodegradable Glass Some plastics	[1]
11	Smart materials are materials whose properties can change due to changes in pressure, force, light or temperature. true	[1]
12	A renewable source is one that cannot be renewed within 50 years. false	[1]
13	Preservatives are added to foods to make the shelf life shorter. false	[1]

Question Number	Answer	Max Mark
14	Job production is used to make large batches of products. false	[1]
15	Ethical trading is a term used to show that the basic rights of the employees are protected. true	[1]
Section A Total		[15]

SPECIMEN

Section B		
Question Number	Answer	Max Mark
16(a)	<p>When designing new products manufacturers have to consider many factors. Explain how manufacturers consider the following when developing new products.</p> <p>Two marks for each section.</p> <p>Market Research 2x1 [2]</p> <p>one mark for statement and one mark for qualifying it</p> <ul style="list-style-type: none"> • Research, analysis of existing products. – to see what is already available / competitors are producing / to develop a product which will be unique / fill the gap in the market • Investigate / look at the nutritional profiles of products – to see if they can be improved / meeting the current demands for foods with a better nutritional profile, examples may be given • Disassembly of existing products – to look at how they have been made • Carrying out of consumer research – use of surveys/questionnaires to identify the gap in the market . <p>Properties required by product- linked to the storage / nutritional/ target group etc – factors that contribute to the design specification</p> <p>Product Development: 2x1 [2]</p> <ul style="list-style-type: none"> • Changing an aspect or all of the design eg ingredients, colour, size etc. • Refining the product – so that it can be successfully produced for sale • Developing the product so that it fully meets the design specification / meets the needs of the consumer • Nutritional requirements – development of the nutritional profile • Enhancing a product with decoration / ensuring that its appearance is attractive • Development of the information for packaging – e.g. storage instructions / reheating instructions. • Adding extra nutritional features <p>Functionality: 2x1 [2]</p> <ul style="list-style-type: none"> • Is it fit for its intended purpose / does it meet the design brief and specification / the needs of the identified consumer • Ease of manufacture / can it be manufactured / may state method of manufacture • Appealing taste / texture and nutritionally sound • Attractive & is saleable – so that the product can be sold to make a profit/ manufacturer does not lose money. 	

Question Number	Answer	Max Mark
	<p>Safety:</p> <p style="text-align: right;">2x1 [2]</p> <ul style="list-style-type: none"> • ingredients – need to be purchased from reliable sources so that the quality of the product is of a high standard • Correct storage of ingredients – e.g. temperatures of fridges / freezers given • Legal requirements & legislation - in the production of food – e.g. trained food workers with relevant qualifications / HACCP systems Food labelling laws – e.g. order ingredients are on a label / use of additives • Safety standards- labelling – to ensure that the consumer stores and cooks the product so that it is safe to eat • Safety in the workplace & safety of workers when making – must be trained, may give examples of qualifications – food hygiene certificates <p>Aesthetics:</p> <p style="text-align: right;">2x1 [2]</p> <ul style="list-style-type: none"> • The look/appearance/taste of the product. • Style of product. • Properties of product- nutritional, flavour, colour, texture etc. 	[10]
16(b)	<p>A manufacturer wishes to develop a range of organic food products to be sold in a supermarket.</p> <p>List three organic fruits or vegetables that could be used in a product.</p> <p>Any three vegetables or fruit e.g. apples, pears, bananas, strawberries, raspberries etc carrots, onions, courgettes, tomatoes, lettuce etc</p>	[1]
16(c)	<p>Give two reasons why consumers choose to purchase organic food.</p> <ul style="list-style-type: none"> • not consuming chemicals • Perceived to be better for you • organic farming is less harmful to the environment. If herbicides and pesticides are not used wildlife can flourish • no potentially polluting chemicals are used • organic farming has a lower carbon footprint than conventional agriculture. 	[4]
17(a)	<p>Design a new product using some organic fruit or vegetables on your list in question 1b that meets the following specification:</p> <ul style="list-style-type: none"> • Appeal to children • Suitable to go in a packed lunch • Contain calcium • Uses raw fruit/vegetables 	

Question Number	Answer	Max Mark
	<p>Use sketches and notes, as appropriate, to show your initial ideas for your chosen product. Do not draw the packaging.</p> <p>Do not penalise candidates if they have not used a drawing if it would not serve a purpose</p> <p>Maximum of six marks. 6x1 [6]</p> <ul style="list-style-type: none"> • Design idea with no notes/ annotation. • One idea with labelling • More than one idea with notes and / or annotation • A range of design solutions with notes and / or annotation • A range of design solutions, with notes and / or annotation and colour. • A creative range of ideas with detailed notes and annotation clearly reflecting how the specification points are met 	[6]
17(b)	<p>Use notes and sketches where appropriate to develop <u>one</u> of your initial ideas.</p> <p>Answers must reflect the product focus & refer to 'specification'.</p> <p>Maximum of five marks. 5x1[5]</p> <ul style="list-style-type: none"> • One developed solution showing an idea from the initial ideas with some development but no annotation • One developed idea with notes – showing reference to one specification point • Clear & annotated development of an idea.- showing reference two specification points • Idea & annotation that refers / links to three specification points. • Idea & annotation that refers to four specification points <p>Points to consider:</p> <p>Views giving detail of product reference to the function of the ingredients used and how they meet the specification.</p> <p>Techniques/ methods identified – may state how the product is produced makes it suitable for a packed lunch – reference to ease of eating / small size / not requiring cutlery etc.</p> <p>How it is suitable to appeal to children - colours identified or shown / appealing shape etc.</p> <p>Reference to the nutritional profile – must be able to show the ingredients</p> <p>Ingredients/materials/components – identifying the raw fruits / vegetables</p> <p>Calcium – use of ingredients with good source of calcium – e.g. dairy foods, white bread (added by law), bones of canned fish e.g. salmon, sardines etc.</p>	[5]

Question Number	Answer	Max Mark
17(c)	<p>With reference to the 6Rs select and describe <u>two</u> ways in which the packaging for your product could address <u>two</u> of these issues. Do not credit the same point twice Credit any reference to any two of the 6Rs. 4x1[4]</p> <ul style="list-style-type: none"> • Recycle – use of the recycled materials to make the packaging – reference to card / paper <ul style="list-style-type: none"> ○ Use of materials which can be recycled e.g. card / per / some plastics ○ Use of packaging materials which are compostable • Reuse – packaging materials such as plastic containers – used to store other things in • Reduce – use the minimal amount of packaging to keep the product safe <ul style="list-style-type: none"> ○ use the minimal amount of chemicals in the production of the products packaging ○ Reduce the amount of packaging which comes from unsustainable sources • Refuse – to use packaging that does not come from a sustainable source – refuse to use materials which come to you overpackaged • Rethink - components used in the packaging and purpose of the packaging. • Repair - repair of manufacturing equipment – rather than throwing away 	[4]
18(a)(i)	<p>Give a suitable technique/method of making of your product. Any one suitable method. Must use correct technical terms</p>	[1]
18(a)(ii)	<p>Describe <u>four</u> stages relevant to this technique/method. Four marks for description of relevant stages relating to i) technique or method selected. Do not credit reference to hygiene 4x1[4]</p> <ul style="list-style-type: none"> • Preparation of ingredients • Specialist tools & equipment. • Method of making / process referring to specialist terminology. e.g. how it's made / consistency / thicknesses of mixtures. • Finishing. 	[4]
18(b)	<p>Name a piece of equipment that would be needed for your technique/method. Any one suitable / relevant piece of specialist equipment needed for (a)(ii). Do not credit any repeats from (a)(ii).</p>	[1]

Question Number	Answer	Max Mark
18(c)	<p>Give <u>two</u> safety precautions that should be taken into account when using tools and equipment.</p> <p>Two marks: 2x1[2]</p> <ul style="list-style-type: none"> • Know how / trained how to use the tools and equipment • Machine is set up for use correctly • Equipment correctly used e.g. correct use of knives, correct coloured boards for the foods being prepared • Would need to wear protective clothing when operating tools and equipment • Have correct footwear • To ensure long hair is tied back • No loose clothing • Eye protection if appropriate • Need to check the machinery before use – no obvious parts missing • That maintenance checks have been completed. 	[2]
18(d)	<p>The Government are concerned about the health of the nation. Discuss how manufacturers have responded to this.</p> <p>Answered in reference to the refuse / reduce / rethink section of unit two of the specification</p> <p>Adapting of traditional foods to comply with current nutritional thinking - Reduction of fats, salt, sugars in foods for health reasons– e.g. fat and links to obesity / heart disease, sugar – obesity / issues with teeth, salt linked to high blood pressure / heart disease</p> <p>Production of foods which are linked to healthier options - consumer preference has led to a demand for these products. They are often targeted at certain groups of people e.g. weight watchers, children’s lunch boxes</p> <p>Clearer nutritional labelling - information clearly shown on the front of products – as % of RDA, how many portions of fruit and vegetables it contributes to. May use a traffic light system so consumers can make informed choices easily. Some consumers think this is confusing as not all supermarkets are using the same methods</p> <p>Products developed in relation to ‘new’ diets - Products developed to complement the latest trends – this may be linked to general nutrition or specific diets - GI index – indicated on the front of packets</p> <p>Increased amount of organic foods available. People are choosing to purchase these foods because they feel they are better for you. Not used fertilisers on them, free from genetic modification – however there is still a lot of debate about whether the nutritional value of the foods is better than conventionally farmed foods</p> <p>Level 1 (0-2 marks)</p> <p>Basic discussion, if candidates only write in point form a maximum of 2 marks should be awarded, showing some understanding of how manufacturers have responded to Government concerns about the health of the nation.</p> <p>There will be little or no use of specialist terms. Answers may be ambiguous or disorganised. Errors of grammar, punctuation and spelling</p>	[7]

	may be intrusive.	
Question Number	Answer	Max Mark
	<p>Level 2 (3-5 marks) Adequate discussion, showing an understanding of how manufacturers have responded to Government concerns about the health of the nation. There will be some use of specialist terms, although these may not always be used appropriately. The information will be presented for the most part in a structured format. There may be occasional errors in spelling, grammar and punctuation</p> <p>Level 3 (6-7 marks) Thorough discussion, showing a clear understanding of how manufacturers have responded to Government concerns about the health of the nation. Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate can demonstrate the accurate use of spelling, punctuation and grammar.</p>	
		Section B Total [45]
		Paper Total [60]

Assessment Objectives Grid (includes QWC)

Question	AO1	AO2	AO3	Total
1	1			1
2	1			1
3			1	1
4	1			1
5	1			1
6		1		1
7	1			1
8	1			1
9			1	1
10	1			1
11			1	1
12			1	1
13			1	1
14			1	1
15			1	1
16	10	5		15
17		11	4	15
18	12	3		15
TOTAL	29	20	11	60