

GCSE 2004

June Series



Mark Scheme

Design and Technology: Food Technology *(3542 – Full Course Higher)*

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The answers given in the following mark schemes are neither exhaustive nor exclusive. Candidates whose answers do not appear directly on the mark scheme, but who have demonstrated knowledge, understanding, or skills relevant to the question will receive appropriate credit for their answers.

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ASSESSMENT AND QUALIFICATIONS ALLIANCE
GENERAL CERTIFICATE OF SECONDARY EDUCATION

Summer Examination 2004

DESIGN AND TECHNOLOGY: FOOD TECHNOLOGY

Full Course – Higher Tier

Question 1

- (a) (i) Any three relevant answers e.g.
- Interviews with consumers/ experts
 - Consumer surveys
 - Taste panels
 - Questionnaires
 - Internet search
 - Literature search, books, magazines
 - Media sources e.g. TV, Videos
 - Comparative shop/ market research/ supermarket survey
 - Analysis of existing products/ disassembly
 - Market trends/ sales figures
 - Electronic sources e.g. CD ROMS
 - Primary research
 - Secondary research
- 3 x 1 mark
3 marks
- (ii) Any method of consumer research: (see (a) (i))
No marks as these are given in Q1 (a)(i)
Details given may include:
- Aim of research
 - Size of consumer sample
 - Examples of questions
 - Numbers of questions asked
 - Method of recording results/ analysis of results
 - Evaluation of how results may be used
 - Target group
 - Types of questions asked e.g. open/ closed
- 4 x 1 mark
4 marks

- (b) Answers may refer to individual products, to nutritional values or healthy eating goals e.g.
- Low energy values compared to other foods
 - Energy from starch carbohydrate rather than from excess sugar, fat
 - May relate to why samosa/ spring rolls are higher in energy due to addition of fat during cooking/ cooking method
 - Source of protein for growth and repair/ LBV/ secondary energy
 - Low sugar content
 - Source of dietary fibre
 - May also refer to benefits of healthy options e.g. links with tooth decay, heart disease, cancer, diverticulosis, obesity, digestive system
 - Samosas/ spring rolls are wrapped in pastry and therefore high in carbohydrates
 - Reference to the table may be evidenced by relating answer to varied products or data shown

Range of simplistic answers or several detailed, reasoned answers, giving reference to the table	5-6 marks
Simplistic answers, some reasoned, with reference to the table	3-4 marks
Simplistic answer or one detailed answer, may not refer to table	1-2 marks

6 marks

- (c) Advantages
- Reduced time
 - Reduced effort
 - Reduced skill
 - Standard quality
 - Consistency
 - Authentic flavours
 - Convenience for busy lifestyles

Disadvantages

- May be more expensive
- Storage facilities
- Uncertainties of brand quality
- Portion sizes may be inadequate
- May contain additives colour/ flavours/ preservatives
- Can be less healthy due to processing techniques- high in sugar/ fat
- Lower nutritional content due to processing e.g. vitamin C/ B lost
- Environmental issues- extra packaging

Several relevant answers, giving both advantages and disadvantages	3-5 marks
Simplistic answers, some may be detailed	1-2 marks
*maximum of 3 marks if advantages or disadvantages omitted	

5 marks**Total 18 marks**

Question 2

- (a) (i) Each sketch should reflect the design criteria.
 Ideas produced must be different products, not variations of the same product.
 Ideas should be communicated through the use of notes and sketches including 2D , 3D or cross section sketches.

For each design idea:

Recognisable annotated sketch reflecting general design criteria	5 marks
Recognisable annotated sketch but some point omitted or repeated	3-4 marks
Products described lack detail suitability or annotated	1-2 marks
Products described are unsuitable and lack annotation	0 marks

*maximum of 2 marks only if sketch or notes missing

2 x 5 marks

10 marks

- (ii) No marks given for choice
 If no idea ticked read response to ascertain which product chosen
 Explain in detail how the chosen design idea meets the design criteria
 Any relevant reason, related to the design criteria/ expanding on criteria not repeating.
 May give justification for inappropriate ingredient or choice.
 Must be reasoned answer considering the necessary factors

2 full or several simplistic answers	3-4 marks
1 full or 2 simplistic answers	2 marks
1 simplistic answer	1 mark

*maximum of 2 marks if straight repeat of design criteria only

4 marks

- (b) (i) This should refer back and develop the earlier design specification by adding detail. Crisp and chunky texture. Specifications should not be included as these are covered in the previous question. The product specification may include:

- Portion size e.g. 150g per person/ proportion of ingredients
- Costs e.g. sold for £1.50
- Target group/ consumer e.g. product will be suitable for children
- Volume/ weight e.g. total weight will be 300g
- Dimensions e.g. thickness of pastry, size of vegetables
- Shape e.g. cut 5mm cubes
- Storage details
- Shelf life e.g. will store for 3 days in refrigerator
- Nutrition/ dietary details e.g. less than 5g fat per 100g
- Preparation methods
- Cooking methods/ reheating
- CCP's/ times/ temps.
- Designated tolerances
- Finishing techniques
- Specific sensory details
- Specific types of ingredients e.g. red onions, filo pastry

5 x 1 marks
5 marks

- (ii) Explain why each ingredient is used.

Quantities of ingredients:

- Accept metric or imperial but not a mixture of both
- Correct proportions?
- Prototype for test kitchen **not** large scale production
- Ingredients
- Workable recipe no major ingredients omitted
- Ingredients specified e.g. butter not 'fat', plain flour not 'flour'.

Reasons for use:

Relevant reason given (appropriate for type of pastry/ filling used) for use of main ingredients in both pastry and filling sections e.g.

- Flours- bulking agent, addition of dietary fibre, vitamin B, thickening, gluten content, gelatinisation, dextrinisation, elasticity
- Fats- for colour, flavour, shortening, shelf life, nutrient content, consistency, trapping air
- Liquids- binding, nutrient content, increase volume/ consistency/ developing gluten, raising agent
- Salt- develop flavour, strengthening of gluten
- Vegetables- colour, flavour, texture, vitamin content, nutrient content, dietary fibre, gives bulk to sauce

Detailed answer giving correct quantities, ingredients and relevant reasons for both pastry and filling	8-10 marks
Detailed answer giving correct quantities, ingredients and some relevant reasons for both pastry and filling. Minor omissions.	5-7 marks
Some detailed answers giving quantities and some relevant reasons	3-4 marks
Simplistic answer giving some relevant quantities, ingredients and/ or reasons	1-2 marks

*maximum of 5 marks if only pastry or filling attempted

10 marks

- (iii) Marks awarded are for prototype made in a test kitchen not large scale production.
N.B. Answers do not have to cover all aspects in order to gain full marks.
 Look for candidate showing awareness of different aspects e.g. at least one reference to important temperatures, named process, control check, feedback.

- Logical sequence shown through flow chart/ prose/ bullet points
- Specialist terminology
- Timings
- Temperatures
- Named processes
- Personal hygiene
- Kitchen hygiene
- Food hygiene
- Safety
- Clear instructions

Up to 8 marks

Appropriate critical controls:

- Times
- Temperature
- Hygiene
- pH
- Bacterial count

2 x 1 mark

Feedback:

- Show 2 examples.

2 x 1 mark

Detailed answer showing logical plans, controls and feedback	10-12 marks
Detailed answer showing logical plans, controls and feedback. Minor omissions	7-9 marks
Some parts detailed but may not be logical and misses controls and/ or feedback	4-6 marks
Simplistic answer giving some relevant planning	1-3 marks

12 marks

Total 41 marks

Question 3

- (a) Answers may include any two of the given sensory areas.
Answers may relate to the addition or removal/ modification of existing ingredients with reasons for use.

Sensory area:	Development:
-‘crisp texture casing’	Addition of crisp finishing techniques, adjusting of time/ temperature.
-‘spicy aroma’	Addition of named herbs/ spices, chilli powder, curry flavour, paprika, mustard, chillies, onion
- hot flavour	Addition of named herbs/ spices, chilli powder, curry flavour, paprika, mustard, chillies, onion, garlic, ginger, spices
- variety of colour	Any vegetable that will add different/ contrasting colours to filling: named herbs/ , spices, peppers, carrots, sweetcorn.
- golden colour casing	Addition of egg wash, grated cheese or other finish that will enhance golden colour

2 x 1 mark for identifying sensory area.

2 marks

Detailed relevant answer, giving reason for development	2 marks
Simplistic answer lacking detail or reason	1 mark

2 x 2 marks for developments

4 marks

6 marks

- (b) (i)
- Improve quality control procedures
 - Cut vegetables or pastry to designated tolerances for size or thickness
 - Vegetables or pastry to designated tolerances for shape
 - Use electronic scales for accuracy in weighing of ingredients
 - Use of moulds/ templates
 - CAM

Detailed relevant answer, giving reason for development	2 marks
Simplistic answer lacking detail or detail	1 mark

2 marks

- (ii)
- Check temperature of the fat/ too cool
 - Check frying time
 - Drain well after frying
 - Absorbs excess fat with absorbent paper

Detailed relevant answer, giving reason for development	2 marks
Simplistic answer lacking detail or reason	1 mark

2 marks

Total 10 marks

Question 4

- (a) (i) Critical control points (CCPs)
- Checks on aspects that could prove a danger to the consumer's health
 - Could be fatal consequences if not completed
 - Relate to critical times, temperatures
 - Relate to food hygiene considerations e.g. bacterial count, pH count
 - Essential control checks for the safety of the food
 - Reference to biological, physical or chemical hazards

2 x 1 mark

1 detailed or two simplistic points	2 marks
One simplistic point	1 mark

2 marks

- (ii) Quality control checks:
- Cover non safety points that are not risks to the health and safety of the consumer/ but will affect overall quality of the final product
 - Relate to shape
 - Relate to colour
 - Relate to methods/ processes used
 - Relate to sizes and dimensions
 - Relate to sensory appeal e.g. taste, texture, colour
 - Shelf life
 - Storage conditions
- Both are part of the quality assurance procedures

2 x 1 mark

1 detailed or two simplistic points	2 marks
One simplistic point	1 mark

2 marks

- (b) Temperature control is important when manufacturing food products.
- i Room temperature 10-36°C GIVEN –NO MARKS
 - ii Danger zone for bacterial contamination linked to 5 to 63°
 - iii Safe reheating of ready made products linked to 72° and above
 - iv Storing foods in the freezer linked to –18 to -27°C
 - v Chilling foods in the refrigerator linked to 1 to 4°C

4 x 1 mark for correctly placing label. Temps not needed for mark as shown by brackets

4 marks

- (c)
- Used as a sensor for food temperature
 - Reset control
 - Clean before and after use
 - Anti bacterial wipe
 - Insert into centre of food
 - Do not touch base of container
 - Leave until temp stabilised
 - Should reach 72°C or above/ food spoilage bacteria killed
 - For minimum of 2 minutes to ensure/ safe to eat

Explains 1 or 2 points in detail or several simplistic differences	3-4 marks
Explains one point in detail or 2 simplistic differences	1-2 marks

4 marks

Total 12 marks

Question 5

- (a) Answers should include both notes and sketches for full marks.
Toppings may include any relevant topping, or show different techniques/
application methods e.g.

- Mashed- different varieties allowed for 2 marks e.g. flavour added
- Crisp topping e.g. potato crisps
- Piped
- Sliced
- Diced
- Sautéed
- Fried and sliced
- Roast
- Rosti
- Grated
- Quarters
- Small whole potatoes
- Wedges/ skins
- Addition of a garnish

Sketches should be accompanied by prose or annotation clearly
describing design idea.

Recognisable sketch and clear description of design idea	3 marks
Recognisable sketch and description may lack clarity	2 marks
Sketch or description only- lack of clarity	1 mark

2 x 3 marks

6 marks

- (b) Answers may include personal safety or specific food safety as relevant to specified equipment. Precautions given should be different for full marks e.g.

Equipment	Safety Precautions	Reasons
Grating/ slicing disc	<ul style="list-style-type: none"> • Personal safety: use of protective clothing • Keep fingers away from blade • Correct training before use • Care with fitting attachments • Store sharp blades safely in container or covered • Check clean before use 	<ul style="list-style-type: none"> • Personal danger of cuts • Accidents less likely if worker is well trained • Machine may not work efficiently if attachments not securely fitted • Prevent contamination
Deep fat fryer	<ul style="list-style-type: none"> • Visual checking condition of flexes • Visual checking condition of plugs • checking condition of equipment base/ cover/ controls • Safety with electricity: no water in contact • Switch on only after setting up • Read and follow instructions carefully • Do not leave fryer unattended • Do not over fill • Protect worker from splashes • Check clean before use 	<ul style="list-style-type: none"> • Danger of electrocution, electric shock • Machine may not work efficiently if attachments not securely fitted • Accidents more likely if instructions are not followed • Danger of burns from hot fat • Danger of fire if fat gets too hot • Prevent contamination

Detailed precautions and several relevant reasons given	6-8 marks
Mixture of detailed and/ or several simplistic precautions and reasons	3-5 marks
Several simplistic precautions and some related simplistic reasons	1-2 marks

8 marks

- (c) Any two relevant answers:
- Reduce waste
 - Controls temperature
 - Controls timings
 - Protects workers- safer
 - More efficient than human- less human error
 - More consistent product

2 x 1 mark

Two simplistic advantages or one detailed advantage	2 marks
One simplistic advantage	1 mark

2 marks

Total 16 marks

Question 6

- (a)
- Team of workers
 - Making large quantities of same product/ specific quantities of a product
 - Making identical products
 - Quick response to changing market
 - Workers often have own specific part in production/ sharing of tasks/ skilled workers needed
 - Equipment can be used for more than one product
 - May give examples e.g. seasonal products- limited run

Two detailed or several simplistic answers	3 marks
One detailed or two simplistic answers	1-2 marks

3 marks

- (b) (i)
- Reduces human error
 - Saves time/ calculations quicker
 - Can make alterations or modifications easily
 - Simulates effects of possible design changes e.g. profit margins
 - Changes made without having to remake product
 - Can handle larger numbers/ calculations than human workers
 - Enables storage of data for future use
 - Improved presentation
 - Less paperwork
 - Easier to communicate and share information with others/ read information

Two detailed or several simplistic answers	3-4 marks
Mixture of detailed and/ several simplistic answers	1-2 marks

4 marks

- (ii)
- Use alternative ingredients e.g. different variety of onion that may be cheaper
 - Changing proportions of ingredients used
 - Using larger quantities of less costly ingredients
 - Shopping around for new suppliers/ better value for same quality
 - Buying some ingredients in bulk
 - Appropriate storage of ingredients
 - Accuracy in ordering ingredients/ buy only what needed
- Credit should be given for appropriate examples given.

1 detailed or 2 simplistic answers	2 marks
Simplistic answer	1 mark

2 marks

(c) Packaging of salads

Type of packaging	Reasons
Rigid plastic containers	<ul style="list-style-type: none"> • Protects foods/ strong/ stops crushing • Food is visible • Easy to print on • Easy to transport home • Can be moulded to shape needed • Moisture resistant/ heat resistant • Lightweight • Cheap • Resistant to acids/ chemicals • Can be sealed • Recyclable
MAP	<ul style="list-style-type: none"> • Flushed with mixture of gases/ prevents salad ingredients from deteriorating • Extends shelf life/ up to 10 days • Sealed/ impermeable to air • Prevents contamination • Keeps fresh longer • Retains colour • Foods visible

Mixture of detailed and/ or several simplistic answers for both	5-6 marks
Attempts mixture of detailed and/ or simplistic answers for both	3-4 marks
Simplistic answers – may only answer for one packaging material	1-2 marks

6 marks

(d)

Labelling information	Why this information is important
150g e	<ul style="list-style-type: none"> • Weight 150g • Weight of food not packaging/ net weight • Weight/ volume • Weight must be on by law • e= average quantity • g= grams
'Wash before use'	<ul style="list-style-type: none"> • Indicates not ready to use • Product may still have insecticides etc still on product • Possible danger to health if consumed Without washing • Warning to consumers • Removal of soil
'use by July 11'	<ul style="list-style-type: none"> • Product MUST be eaten by 11 July • After this date product is unsafe to use • Danger of food poisoning • Legal requirement • Warning to consumers

Mixture of detailed and/ or several simplistic answers for all parts	5-6 marks
Attempts detailed and/ or simplistic answers for at least two parts	3-4 marks
Simplistic answers – may only answer – may only answer for one/ two parts	1-2 marks

6 marks
Total 21 marks

Question 7

- (a) Some vegetable products are now labelled ‘Organic’.
For full marks answers should cover definition and reasons for popularity.

Definition:

- Organic vegetables are vegetables grown naturally/ natural control of weeds/ pests
- Without the use of chemical aids e.g. fertilisers
- Without the use of chemical aids e.g. pesticides
- Using traditional farming methods/ use of crop rotation
- Grown to strict regulations controlled by EU and UKROFS (UK register of organic food standards)
e.g. designated growth areas

2 marks

- (b) Reasons for increasing popularity:

- Perceived to be healthier/ reducing risks of cancer
- Perceived more environmentally friendly/ supports the ecosystem
- Perceived more sustainable method of food production
- No risk of contamination by chemicals/ pesticides
- No risk of contamination by drugs/ antibiotics
- Organic farmers maintain countryside hedgerows/ wildlife so more environmentally friendly
- More expensive than other vegetables as labour intensive but often thought to be good value as give choice to consumers
- Limited variety at present this increasing
- Free from GM and irradiated foods
- Perceived to be higher quality/ better flavour
- Perceived to cause less pollution/ chemical/ less poisoning of wildlife/ animals/ insects
- Perceived to be free from artificial additives/ less cause of allergies
- Influence of media and advertising
- Psychological factors
- More people growing own

Not vegetable linked but may be credited if used as shows knowledge:

- Livestock are free range and only fed organic foodstuffs
- Animal production does not use antibiotics

Several well qualified answers or range of simplistic points	4-5 marks
Well qualified answer or range of simplistic points	2-3 marks
Simplistic relevant answer	1 mark

5 marks

Total 7 marks

Total marks on Paper 125