

# GCSE 2004

## *June Series*



# Mark Scheme

## Design and Technology: Food Technology *(3552 – Short 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

**Short Course – Higher Tier**

Question 1

- (a) (i) Any three relevant answers e.g.
- Analysis of existing products/ disassembly
  - Interviews with consumers/ experts
  - Consumer surveys
  - Taste panels
  - Questionnaires
  - Internet search
  - Literature search, books, magazines
  - Media sources/ TV/ Video
  - Comparative shop/ market research/ supermarket survey
  - Market trends/ sales figures
  - Electronic resources. 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
  - Numbers of questions asked
  - Method of recording results/ analysis of results
  - How evaluation of results may be used
  - Target group
  - Types of questions asked e.g. open/ closed
  - Examples of questions
- 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 dietary fibre, 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 named 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

**Total 13 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.  
 \* Products must not contain 'meat' or 'fish' as vegetarian product

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 and annotation	1-2 marks
Products described are unsuitable and lack annotation	0 marks

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 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) 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/ components are 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
- Liquids - binding, nutrient content, increase volume/ consistency/ developing gluten, raising agent
- Vegetables - colour, flavour, texture, vitamin content, dietary fibre, nutrient content gives bulk to sauce
- Fats - for colour, flavour, shortening, shelf life, nutrient content, consistency, trapping air
- Salt - developing flavour, strengthening of gluten

Detailed answer giving correct quantities, ingredients and relevant reasons	8-10 marks
Detailed answer giving correct quantities, ingredients and some relevant reasons. Minor omissions	5-7 marks
Some detailed answers giving quantities, ingredients 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**

- (ii) 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 candidates showing awareness of different aspects e.g. at least one reference to important temperatures, named process, control check

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

8 marks

Appropriate critical controls:

- Times
- Temperatures
- Hygiene
- pH
- Bacterial count

2 x 1 mark

Feedback:

- Show 2 examples.

2 x 1 mark

Detailed answer showing logical plans, control 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 36 marks**

Question 3

- (a) Answers should give different hazards with related control check for each stage.  
 Hazards may relate to either workers or consumers  
 Generic examples are given but credit may be given for more specific details, temps, times etc.  
 Answers should relate to bacterial contamination NOT ‘germs’.

Production stage	Hazard	Control
Delivery and storage of raw materials	<ul style="list-style-type: none"> <li>• Microbiological/ bacterial contamination from raw foods</li> <li>• Physical contamination from packaging/ insects</li> <li>• Chemical contamination from fertilisers/ pesticides</li> </ul>	<ul style="list-style-type: none"> <li>• Reputable supplier</li> <li>• Correct storage temperatures</li> <li>• Checking of quality of ingredients on arrival</li> <li>• Check use by dates</li> <li>• Thorough washing of veg. Before use</li> <li>• Keeping raw fresh food separate</li> </ul>
Preparation of vegetables	<ul style="list-style-type: none"> <li>• Microbiological/ bacterial contamination from incorrect storage/ working conditions – times/ temperatures/ methods</li> <li>• Physical contamination from workers/ equipment</li> <li>• Sharp utensils/ equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Accurate weighing of ingredients</li> <li>• Correct storage temps in refrigerator/ dry store</li> <li>• Checks on condition of equipment</li> <li>• Checks on personal hygiene of workers</li> <li>• Checks on kitchen hygiene and workplace</li> <li>• Training of staff in safe use of equipment</li> </ul>
Cooking soup and adding the cream	<ul style="list-style-type: none"> <li>• Microbiological/ bacterial contamination from times/ temperature/ methods</li> <li>• Physical contamination from workers/ equipment</li> <li>• Microbial survival</li> <li>• High temperature</li> </ul>	<ul style="list-style-type: none"> <li>• Checks on cooking temperatures</li> <li>• Checks on condition of equipment</li> <li>• Checks on personal hygiene of workers</li> <li>• Checks on kitchen hygiene and workplace</li> <li>• Use of CAM</li> <li>• Training of staff in safe use of equipment</li> </ul>
Packaging product ready for sale	<ul style="list-style-type: none"> <li>• Microbiological/ bacterial contamination from poor storage/ cooling procedures</li> <li>• Physical contamination from packaging/ workers</li> <li>• Microbial growth</li> <li>• Foreign bodies</li> </ul>	<ul style="list-style-type: none"> <li>• Checks on condition of equipment</li> <li>• Correct storage temps/ times in refrigerator/chiller</li> <li>• Checks on personal hygiene of workers</li> <li>• Metal detection</li> </ul>

**8 marks**



(b) Answers may relate to personal or food safety

Equipment	Safety Precautions	Reasons
Hand Blender	<ul style="list-style-type: none"> <li>• Personal safety: no loose clothing, hair</li> <li>• Keep fingers away from blade</li> <li>• Correct training before use</li> <li>• Check condition of flexes</li> <li>• Check condition of plugs</li> <li>• Check condition of base/ cover/ controls</li> <li>• Read and follow instructions correctly</li> <li>• Safety with electricity e.g. keep away from water</li> <li>• Keep fingers away from blades when switched on</li> <li>• Wash before use/ after use</li> </ul>	<ul style="list-style-type: none"> <li>• Danger of electrocution/ electric shock</li> <li>• Accidents more likely if instructions are not followed or training not given</li> <li>• Danger of cuts</li> </ul>
Food Probe	<ul style="list-style-type: none"> <li>• Wipe with anti bacterial wipe after every use</li> <li>• Reset controls before use</li> <li>• Follow manufacturers instructions</li> <li>• Ensure position in centre of food 2 mins</li> <li>• Leave until stabilised 72°C/ to ensure bacteria killed</li> <li>• Safe handling techniques</li> </ul>	<ul style="list-style-type: none"> <li>• To avoid cross contamination</li> <li>• To avoid food poisoning</li> <li>• To ensure accurate readings</li> <li>• Prevents personal injury from probe</li> </ul>

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/ or some related simplistic reasons	1-2 marks

**8 marks**

- (c) (i)
- Every product produced will be the same quality
  - Examples: same size
  - Same shape
  - Same sensory quality e.g. colour, flavour, texture, aroma, appearance
  - Quality assurance for consumers
  - Same weight
  - Same amount of individual ingredients/ components
  - Manufacturers work to designated tolerances
  - Quality control

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

**4 marks**

- (ii) CAM and consistency
- Gives a standard outcome
  - Controls same times
  - Controls same temperatures
  - Gives accuracy of all products
  - Precision products
  - Light refractor- colour changes
  - Light detector
  - Temperature of ovens/ freezers using sensors
  - Metal detector
  - Load cells to measure weight and give feedback
  - Reduces human error

1 detailed answer	2 marks
2 simplistic answers	1 mark

**2 marks****Total 22 marks**

Question 4

- (a)
- Team workers
  - Making large quantities of same product
  - Making identical products
  - Quick response to changing market
  - Workers often have own specific part in production/ sharing of tasks/ needs skilled workers
  - May give examples e.g. seasonal products in limited numbers

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

**3 marks**

- (b)
- Reduces human error
  - Saves time, calculations quicker
  - Allows storage of data for future use
  - Can make alterations or modifications easily
  - Easier to communicate and share information with others/ easier to read
  - 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
  - Improves presentation
  - Less paperwork

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

**4 marks****Total 7 marks**

Question 5

- (a)
- Low temperatures
  - Slow down dormant growth of micro organisms/ use of blanching
  - And action of enzymes/ denaturing
  - That cause the decay of the food
  - Production of ice during production draws out the water content
  - Causes dehydration and also prevents growth of micro organisms
  - 0 to -18°C in freezers in 12 minutes.
  - Stored at -18 to -27 °C

2 detailed or several simplistic answers	3 marks
Mixture of detailed and/ or several simplistic answers	2 marks
Attempt at explanation but lacks detail	1 mark

**3 marks**

(b)

Packaging materials	Reasons for choice of material
Paperboard sleeve	<ul style="list-style-type: none"> <li>• Easy to print on</li> <li>• Can be coated/ laminated</li> <li>• Renewable resource</li> <li>• Easy to handle</li> <li>• Lightweight</li> <li>• Can be folded</li> <li>• Cheap</li> </ul>
Plastic container	<ul style="list-style-type: none"> <li>• Can be moulded to shape</li> <li>• Resistant to moisture</li> <li>• Lightweight</li> <li>• Can be fused to seal</li> <li>• Strong</li> <li>• Microwaveable</li> <li>• Cheap</li> <li>• Food may be visible</li> </ul>
Plastic bag for the sauce	<ul style="list-style-type: none"> <li>• See through</li> <li>• Heat resistant</li> <li>• Can be sealed</li> <li>• Lightweight</li> <li>• Cheap</li> <li>• Moisture proof</li> <li>• Suitable for reheating e.g. boil in bag</li> </ul>

2 reasons given for each material	5-6 marks
1-2 reasons given for at least 2 materials	3-4 marks
Simplistic reasons given for 1 or 2 materials	1-2 marks

**6 marks**

(c)

Labelling	Meaning
150g e	<ul style="list-style-type: none"> <li>• Weight 150g</li> <li>• Weight/ volume of food</li> <li>• e= average quantity</li> <li>• Not weight of packaging/ <b>net</b> weight</li> <li>• Legal requirement</li> <li>• g= grams</li> </ul>
Wash before use	<ul style="list-style-type: none"> <li>• Indicates not ready to use</li> <li>• Product may still have insecticides etc on</li> <li>• Possible danger to health if consumed without washing</li> <li>• Warning to consumers</li> <li>• Removal of soil</li> <li>• Legal requirement</li> </ul>
Use by July 11th	<ul style="list-style-type: none"> <li>• Food should be used by date given</li> <li>• On high risk foods</li> <li>• Legal requirement</li> <li>• If not risk quality of food will reduce</li> <li>• Food must not be eaten after the date given</li> <li>• Can lead to food poisoning</li> <li>• Warning to consumers</li> </ul>

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 for one/ two parts	1-2 marks

3 x 2 marks

**6 marks****Total 15 marks**

Question 6

- (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 use of pesticides
- 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 e.g. reducing risk 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
- Perceived to be free from additives/ cause of allergies
- Do not use GM and irradiated foods
- Influence of media and advertising
- Psychological factors
- More people growing their own veg.
- Perceived to be high quality/ more flavour
- Perceived to cause less chemical pollution/ poisoning of insects/ wildlife/ animals
- Fresh veg
- Individual portions
- Hot or cold
- Pastry
- Attractive/ appealing to a variety of consumers
- Media/ advertising influences
- Psychological influences

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 100**