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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Education

Design and Technology: Food Technology 5541/6541

FTY1

Mark Scheme

2007 examination - January series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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GCE Food Technology Unit 1

Quality of Written Communication

The following marks are allocated to the quality of the candidate's written communication. Make a separate assessment of the candidate's overall ability as demonstrated across the paper using the criteria given below.

Performance Criteria	Marks
The candidate will express complex ideas extremely clearly and fluently. Sentences and paragraphs will follow on from one another smoothly and logically. Arguments will be consistently relevant and well structured. There will be few, if any, errors of grammar, punctuation and spelling.	4
The candidate will express moderately complex ideas clearly and reasonably fluently, through well-lined sentences and paragraphs. Arguments will be generally relevant and well structured. There may be occasional errors of grammar, punctuation and spelling.	3
The candidate will express straightforward ideas clearly, if not always fluently. Sentences and paragraphs may not always be well connected. Arguments may Sometimes stray from the point or be weakly presented. There may be some errors of grammar, punctuation and spelling, but not such as to suggest a weakness in these areas.	2
The candidate will express simple ideas clearly, but may be imprecise and awkward in dealing with complex or subtle concepts. Arguments may be of doubtful relevance or obscurely presented. Errors in grammar, punctuation and spelling may be noticeable and intrusive, suggesting weaknesses in these areas.	1

1 (a) Describe the working characteristics of each ingredient during the manufacture of a whisked sponge.

Eggs – trap air when whisked with sugar, coagulate upon heating, add colour to the product, nutritional value
Sugar – adds flavour, traps air, dissolves into a syrup and softens the gluten in flour, caramelisation adds to the colour, texture
Flour – gluten coagulates to form a structure, gelatinisation, sieved to incorporate air, bulk

(3 x 3 marks)

(b) Explain each of the following terms, making reference to cake production.

(i) moisture retention

To prevent the cakes from drying out, becoming stale; extends shelf life.

(4 marks)

(ii) caramelisation

Sugar is heated either as a solid or a solution to a temperature above its melting point. It undergoes decomposition and then turns brown and a 'toffee' like flavour is developed. Heat dissolves sugar to a syrup, such as baked cakes.

(4 marks)

(c) Explain why the fortification of white flour with the micro nutrient calcium would benefit consumers.

To ensure daily RNI is met by as many groups of consumers as possible. Many food products are made from white flour and therefore target group is bigger, e.g. vegetarians who do not eat dairy produce; women, links with osteoporosis. Many snack food products are targeted at young people. Multi-cultural issues.
1 mark will be given for the function of calcium.

(5 marks)

(d) Explain the differences in the composition of 100 g of the food products listed in the table below.

Mark Range 8 - 10

Responses should make clear reference to all of the data provided, using the information given accurately. The correct use of the units of measurement for each nutrient and the differences between each should be explained. Each of the five food products should be mentioned and the nutritional differences per 100 g explained. Credit will be given if responses refer to Calcium content of white bread in UK being fortified and therefore questions amount given. 5 marks maximum for data only.

Mark Range 5 - 7

Three to four food products will be mentioned and reference made to the data, using the information accurately.

Mark Range 2 - 4

Two to three food products will be mentioned and reference made to the data **or** each of the food products will be mentioned superficially.

Mark Range 1 - 3

Food products will be mentioned superficially and little / no reference made to the data.

Mark Range 0

No points worthy of credit

(10 marks)

(e) What are the advantages for manufacturers of using standard pre-manufactured food components in a product range?

Responses will reflect sound and accurate knowledge of why a food manufacturer would use standard food components in a product range. Examples include:

To save production time due to fewer manufacturing processes.
To reduce the amount of equipment needed, reduce production costs, less energy, fewer staff.
To save time purchasing and preparing raw materials.
To ensure consistency in terms of size, weight, shape, flavour and preparation.
To make stock control easier and extend range of products available.
To ensure correct measurements / recipes
To reduce food safety risks e.g. cross contamination
Any well justified response will be credited.

Mark Range 6 - 8
Responses will reflect a full discussion with at least six plus justified points raised
Mark Range 3 - 5
Responses will include a discussion of four to five justified points, **or** eight plus mentioned superficially
Mark Range 1 - 2
Responses will be superficial with little / no justified points raised
Mark Range 0
No points worthy of credit.

(8 marks)

2 (a) Describe the effect of heat on eggs.

Ovalbuminin in the white coagulates at 60 C and white becomes solid and opaque. Proteins in yolk coagulate at 70 C and continue until yolk is hard and dry. Over cooking reduces digestibility. Iron sulphide forms around yolk if overcooked. If heated quickly, proteins coagulate and shrink rapidly. Denaturation – irreversible reaction.

(6 marks)

(b) Explain why a food manufacturer would use soya when designing food products.

Suitable for vegetarians / cheap / easy to store, prepare and cook, little waste, different shapes and forms / source of HBV Protein, easy to fortify / environmental issues. Bulking agent.

Mark Range 6 - 8

Responses will reflect a full discussion with at least six plus justified points raised

Mark Range 3 - 5

Responses will include a discussion of four to five justified points, **or** eight plus mentioned superficially

Mark Range 1 - 2

Responses will be superficial with little / no justified points raised

Mark Range 0

No points worthy of credit.

(8 marks)

(c)

(i) Name two water soluble micro nutrients.

Any combination of the Vitamin B complex, Vitamin C, Iron, Sodium, Potassium

(2 marks)

(ii) Name two fat soluble micro nutrients.

Vitamin A, Vitamin D, Calcium

(2 marks)

(d) **Discuss the effect of food processing on micro nutrients. Make reference to specific food products in your answer.**

Minerals and fat soluble vitamins remain relatively unchanged. Effects of heat, dehydration, water, acid, alkali, oxidation referred to accurately. Specific examples of products must be given.

Mark Range 8 - 10
Responses should make clear reference to four to five water soluble and fat soluble micro nutrients. Specific examples of the micro nutrient must be given.

Mark Range 5 - 7
Three to four micro nutrients will be mentioned and specific examples given.

Mark Range 2 - 4
Two to three micro nutrients will be mentioned accurately **or** more superficially.

Mark Range 1 - 3
Micro nutrients will be mentioned superficially and little / no reference made to specific examples.

Mark Range 0
No points worthy of credit.

(10 marks)

3 (a) Describe five functions of eggs in food production. Make reference to specific food products in your answer.

Responses should include accurate reference to five functions with specific food products given as an example for each.
Binding – fish cakes
Trapping air – cake making, meringue
Glazing – pastries
Emulsifying – mayonnaise
Coating – fried food, e.g. fish
Thickening – custards
Garnishing – salads
Enriching – sauce making
Finishing technique - garnish
Any relevant food will be accepted.
1 mark for function, 1 mark for food product if appropriate function given.

(5 x 2 marks)

(b) Describe the effects of heat on cheese.

Fat melts, protein coagulates; overheating causes protein to toughen and become stringy, reducing digestibility. Reference to specific proteins in cheese.

(4 marks)

(c) Describe the working characteristics of fats and oils in the production of

(i) mayonnaise,

Fats/oils add flavour, consistency:

- oil and water dispersed in each other, they form an emulsion
- after standing, the oil will float on the water
- lecithin prevents the separation of oil and water
- mixture will thicken, vinegar can adjust consistency
- oil is added slowly to prevent it separating out

(4 marks)

(ii) deep fried potatoes.

Increase in fat content, decrease in heat-sensitive nutrients. Temperatures reach 200 C without burning, reduced fat spreads have a high water content and therefore are not suitable. Minimal loss of nutrients at high temperatures. Fats must be free from water and impurities, presence will affect keeping qualities and cause it to splatter when heated, decomposition of impurities will cause 'off' flavours and smells. Golden brown colour. Appearance or texture.

(4 marks)

(d) Explain why many processed food products contain a high percentage of fat.

Flavour, consistency, moisture, shelf-life, colour and nutritional value, method of cooking, mouth feel, texture, cheaper ingredient, bulk out product

(6 marks)

4 (a) Explain the function of each of the following in the production of bread.

(i) strong plain wholemeal flour

high NSP, B vitamins, high gluten helps elasticity, flavour, structure, bulk, texture

(4 marks)

(ii) yeast

raising agent, producing carbon dioxide and alcohol

(2 marks)

(iii) water

activate the yeast, correct temperature, aids gelatinisation, binding

(2 marks)

(iv) fat

improve keeping qualities, colour, flavour

(1 mark)

(v) salt

strengthen gluten, flavour

(1 mark)

(b) Explain the function and importance of soluble and insoluble Non Starch Polysaccharide (NSP). Give an example of each.

Soluble NSP – helps to control blood sugar levels, reduce blood cholesterol. oats, pulses, fruit and vegetables
Insoluble NSP – absorbs water, increases bulk
wholemeal bread, flour, cereals, pasta, rice

Mark Range 5 - 6
The functions and importance of both soluble and insoluble Non Starch Polysaccharides will be given accurately with at least one example of each.
Mark Range 3 - 4
The functions and / or importance of either soluble or insoluble Non Starch Polysaccharide will be given with superficial examples of either soluble or insoluble
Mark Range 1 - 2
Superficial functions of soluble and insoluble Non Starch Polysaccharides will be given, with one or two examples
Mark Range 0
No points worthy of credit

(6 marks)

(c)

(i) What are the effects of *enzymic browning*?

If some foods (e.g. apples) are cut or bruised, the damaged surface will discolour, turning brown due to enzyme action.

(2 marks)

(ii) Name two food products which show examples of enzymic browning.

Any two examples: fruit salad, cider / apple drinks, any suitable examples will be credited.

(2 marks)

(d) Explain why some food manufacturers are trying to reduce the use of food additives in their products.

More natural product to appeal to the consumer, natural products, larger target audience. Additive associated with allergies , hyperactivity in children

Mark Range 6 - 8
Responses will reflect a full discussion with at least six plus justified points raised
Mark Range 3 - 5
Responses will include a discussion of four to five justified points **or** eight plus mentioned superficially
Mark Range 1 - 2
Responses will be superficial with little / no justified points raised
Mark Range 0
No points worthy of credit

(8 marks)