Version 3

General Certificate of Education (A-level)
June 2012

Design and Technology: Food Technology FOOD1

(Specification 2540)

Unit 1: Materials, Components and Application

Final

Mark Scheme

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 events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process 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 standardisation each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised 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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1 **State two deficiency diseases associated with the lack of Vitamin D.**

Rickets and osteoporosis, weak bones, brittle bones.

(2 marks)

2 **Name two sources of iodine.**

Fish and seafood, iodised salt, seaweed, vegetables grown by the sea, cod liver oil, hard water.
Must be specific seafood. *(2 marks)*

3 **Name two food sources of iron.**

Red meat, offal, dark green vegetables, fortified breakfast cereals, curry powder, dark chocolate, egg yolk, dried fruit, wholemeal bread, cereals, cocoa. *(2 marks)*

4 **What is an emulsifying agent?**

Can be added to an additive used to prevent emulsions separating, e.g. salad cream, ice cream as they prevent viscosity
Natural foods which are emulsions are stabilised by emulsifiers
1 mark for a simple answer (possibly not well explained), 2 marks for a clear and accurate answer

(2 marks)

5 **Identify two factors affecting BMR (Basal Metabolic Rate).**

Metabolism, body size, age, activity, pregnancy, state of health, gender. *(2 marks)*

6 **Explain the term fortification of food products.**

Addition of nutrients lost in processing, enhancing nutritional value.
1 mark for a simple answer (possibly not well explained), 2 marks for a clear and accurate answer *(2 marks)*

7 **Describe the effects of food preparation on water soluble and fat soluble vitamins.**

Water soluble: destroyed by light, should be stored in a dark place. Destroyed by heat and in presence of an alkali, leach into water, oxidised by air
Fat soluble: most are stable, when heated, destroyed if fat is rancid, do not dissolve
2 marks allocated to water soluble vitamins. 2 marks allocated to fat soluble vitamins. *(4 marks)*

8 **Explain, with examples, the complementation of protein.**

Either:
two or more incomplete proteins combine to produce complete proteins.

Or:
Proteins can be incomplete or complete (HBV/LBV). On digestion, two or more proteins provide a range of amino acids (a combination of) which can be used to produce proteins of a higher biological value by complementation

2 marks for the explanation and 2 marks for examples

(4 marks)

9 (a) **Discuss the influence of changing consumer lifestyles on food product development.**

Responses will discuss both the effects of changes in consumer lifestyles in the UK and the effects upon food product development. Any well justified response will be credited and may include:

- Aging population
- More leisure time
- Disposable income
- Working mothers
- One parent families
- Unemployment
- Dietary goals
- Snack foods
- Eating out
- Cultural influences
- Living in a recession
- Busy lifestyles
- Environmental issues
- Moral issues
- Travel abroad

and their link to food production development.

Mark Range 8-10: responses will reflect a full discussion with at least 5 plus justified points raised. The two aspects of the question are linked clearly.
Mark Range 4-7: responses will include a discussion of 3-4 justified points, or up to 8 superficial points included which are not justified fully and the two aspects of the question may not be linked well
Mark Range 1-3: responses will be superficial, with little or no justified points raised and may not necessarily 'discuss' the issue raised in the question. Answers may discuss only one aspect of the question
Mark Range 0: no points worthy of credit

(10 marks)

9 (b) Identify different communication methods used in the development of new food products.

Different methods of communication used in food product development will be described in full, with reference to:

Design ideas
Design proposals
Target audience

Each method must have a clear explanation of its importance in food product development.

Mark Range 8-10: responses will reflect a full description with at least 5 points justified
Mark Range 4-7: responses will include a description of 3-4 justified points, or 5 plus superficial points included which are not justified fully
Mark Range 1-3: responses will be superficial, with little or no justified points raised and may not necessarily 'describe' the issue raised in the question
Mark Range 0: no points worthy of credit

(10 marks)

10 (a) Describe the 'design process' in the production of new food products.

Responses should include a description based upon specific stages of the design process. Responses may refer to coursework but specific stages of the design process must be referred to and not a general description of the work.

Specific stages in the design process:

- Background research
- Market research
- Design specification
- Generation of ideas
- Concept screening
- Development and Product Formation
- Testing and Modelling
- Final Product Development
- Evaluation

Mark Range 8-10: responses will reflect a full description, with at least 5 plus stages explained
Mark Range 4-7: responses will include a description of 3-4 stages explained or more mentioned only superficially
Mark Range 1-3: responses will be superficial, or a general description of coursework with few / no stages explained
Mark Range 0: no points worthy of credit

(10 marks)

10 (b) What current health factors and concerns need to be considered when developing new food products?

Responses will include well justified points relating to current health issues and may include:

- Obesity
- Diabetes
- Heart disease, hypertension
- Strokes
- Lactose intolerance
- Alcohol consumption
- Allergies to additives
- Use of pesticides
- Dental caries
- Salt consumption
- Fat consumption, high cholesterol, omega 3s
- Diverticular disease, bowel cancer

Higher scoring answers may examine how these can be challenges or opportunities (i.e. obese people are more likely to buy high fat foods) for food product developers.

Mark Range 8-10: responses will reflect a full discussion with at least 5 points justified
Mark Range 4-7: responses will include a discussion of 3-4 justified points, or 7 plus superficial points
Mark Range 1-3: responses will be superficial, with little or no justified points raised
Mark Range 0: no points worthy of credit

(10 marks)

11 (a) Describe how a range of sweet <u>OR</u> savoury pastry products could be developed to:

- Increase the vitamin C content *(5 marks)*
- Lower the saturated fat content *(5 marks)*
- Improve the flavour *(5 marks)*
- Improve the texture *(5 marks)*

Responses will make reference to a range (more than 1) of sweet or savoury pastry products – not both.

Increase Vitamin C

Fruit based jam/marmalade, green vegetables, tomatoes, peppers, carrots, soft fruits, fruit coulis, citrus fruits, fruit juices, curry powder, tropical fruits, parsley, bananas. Methods of cooking, use of raw garnishes, decoration.
Any well justified response will be credited.

Reduce saturated fat content

Low/reduced fat, thinner/less/types of pastry, lattice/open top, low fat fillings e.g. reduced fat cheese, more fruit and vegetables.

Any well justified response will be credited.

Improve flavour

Use of different types of flour, fat, fillings, herbs, spices. Increase flavour to pastry e.g. ground almonds, fruit peel. Raw garnish. Cooking methods.

Any well justified response will be credited.

Improve texture

Use of different types of flour, fat, fillings, fresh herbs/spices, nuts, seeds, finishing techniques – decorations, garnishes - size of filling - crunchy/smooth.

Any well justified response will be credited.

(20 marks)

11 (b) Explain the use of computer modelling in the production of food products.

Responses may refer to the use of CAD/CAM in the production of food products. Responses may make reference to coursework. Reference may be made to design ideas, design proposals, onscreen sketching of ideas, (digital) photography modelling, research, spreadsheets, scaling up, presenting results, packaging, digital cameras, data logging, ovens, temperature control, metal detectors

Any well justified response will be credited

Mark Range 8-10: responses will reflect a full discussion of the use of various aspects of computer modelling with 4-5 well justified points raised with reference to the production of food products
Mark Range 4-7: responses will include a discussion of the use of some aspects of computer modelling with 3-4 well justified points with reference to the production of food products but quite superficially
Mark Range 1-3: responses will be superficial, with few justified points with regard to the use of computer modelling in the production of food products
Mark Range 0: no points worthy of credit

(10 marks)

11 (c)(i) Name five pieces of information that could be included on a food label.

e.g. name, ingredients, storage, place of origin, weight/volume, instructions for use, traceability, nutritional information, environmental issues, traffic lights system, best before, name of producer, barcodes.

(5 marks)

11 (c)(ii) Choose one piece of information named above in part (c) (i) and discuss its importance to the consumer.

Each point must be well justified in stating the importance of the information to the consumer (NB some candidates may note that some consumers may not find information on a label important, e.g. because they buy the product regularly and do not even read the label / things such as a picture on a label do not affect their choice etc.)

One mark for choosing one piece of information.

(5 marks)

Converting Marks into UMS marks

Convert raw marks into Uniform Mark Scale (UMS) marks by using the link below.
UMS conversion calculator www.aqa.org.uk/umsconversion