Cambridge Assessment International Education

Cambridge IGCSE™

FOOD & NUTRITION **0648/12**

Paper 1 Theory **October/November 2022**

MARK SCHEME

Maximum Mark: 100

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2022 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	<u>'List rule' guidance</u> For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

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6 Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7 Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

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Question	Answer	Marks
1(a)	*citrus fruits* clementines; grapefruits / pamplemousse; kumquats; lemons; limes; mandarins; minneolas; pomelos; satsumas; tangerines;	**3**
1(b)	*different effects on the body if there is a lack of water in the diet* bowel disorders / constipation / diverticular disease; cystitis / bladder issues; dehydration / thirst; dizziness / fainting / fatigue; dry skin; high blood pressure; inability to regulate body temperature; inability to concentrate; infection due to linings of mucus membranes / digestive tract / bronchial tubes not being kept moist; kidney problems / dark coloured urine / decrease in urination; migraines / headaches; pain in joints / muscles due to less lubrication;	**3**

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Question	Answer	Marks
1(c)(i)	*functions of vitamin A* antioxidant; for healthy skin; formation of mucous membranes; helps vision in dim light / at night; prevents night blindness; production of visual purple in retina of eye; required for growth; required to keep mucous membranes, e.g. throat / digestive / bronchial / excretory tracts, moist and free from infection;	**3**
1(c)(ii)	*sources of retinol* dairy products or named example e.g. milk, cheese, butter; eggs; fish liver oil or named example; offal or named example; oily fish or named example;	**3**
1(d)	*reasons why including fruit in the diet can help reduce the risk of obesity* fruit contains dietary fibre; adds to satiety to prevent over eating; fruit is low in carbohydrate / sugar / contains natural sugar; would not provide extra calories; fruit is low in fat; would not provide extra calories;	**4**
2(a)	*animal sources of vitamin B_2* (red) meat or named example; cuttlefish; dairy foods or named example; eggs; fish roe; offal or named example; oily fish or named example; poultry;	**3**
2(b)	*deficiency disease caused by a lack of vitamin B_1* beri-beri;	**1**

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Question	Answer	Marks
3(a)(i)	*functions of iron* aids blood clotting process; CO_2 attaches to haemoglobin transported to lungs for breathing out / disposal; efficient functioning of enzymes in the body; haemoglobin picks up oxygen from lungs and transports to cells; prevent anaemia; production / manufacture / formation of haemoglobin the red pigment in blood; works with enzymes to release energy from food / glucose;	**2**
3(a)(ii)	*functions of phosphorus* formation of bones and teeth; formation of protein / protoplasm; function of cell membranes; energy metabolism / release of cellular energy; kidney function; muscle contractions; normal heartbeat; nerve functioning;	**2**
3(b)	*different physical changes that happen when eggs are heated* egg white changes colour from transparent to white / opaque; egg changes texture from a runny liquid to hard / solid / rubbery texture / thickens / coagulates; a reaction between iron and sulfur causes a green ring to form around yolk if overcooked;	**2**
4	*why someone who is a coeliac should not eat this soup* soup contains <u>wheat</u> flour; wheat contains the protein gluten; coeliacs have a sensitivity / reaction to / cannot fully digest gluten; the lining of the small intestine will be damaged when they eat gluten;	**3**

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Question	Answer	Marks
5(a)	*refrigerator temperature* range of 1 °C to 8 °C;	**1**
5(b)	*freezer temperature* range of –18 °C to –21 °C;	**1**
5(c)	*core temperature for cooked food* range of 70 °C to 75 °C;	**1**
6(a)(i)	*reasons to include vitamin C in the diet of 70-year-old male* antioxidant; helps absorb iron / prevents anaemia; helps heal wounds; helps protect immune system; prevents scurvy; production of connective tissue;	**2**
6(a)(ii)	*reasons to include calcium in the diet of 70-year-old male* helps maintain bones / teeth; helps prevent brittle bones; helps prevent osteomalacia; helps prevent osteoporosis; helps prevent tetany; helps with blood clotting; helps with muscle function; helps with nerve function;	**2**

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Question	Answer	Marks
6(a)(iii)	*reasons to include NSP in the diet of 70-year-old male* help prevent cancer of the colon; helps prevent constipation / helps bulk faeces; helps prevent diverticular disease; helps prevent haemorrhoids; helps prevent hernia; helps prevent obesity; helps prevent type 2 diabetes; helps remove toxins; provides satiety;	**2**
6(b)(i)	*reason to reduce salt in the diet of 70-year-old male* to reduce risk of hypertension;	**1**
6(b)(ii)	*reason to reduce sugar in the diet of 70-year-old male* to reduce risk of tooth decay; to reduce risk of obesity; to reduce risk of type 2 diabetes;	**1**
7(a)	*reasons why butter is used for the shortbread* binds ingredients together; hard fat which does not melt when rubbing in; provides / adds colour; provides / adds flavour;	**2**
7(b)	*reasons why plain wholemeal flour is used for the shortbread* gives a good colour; gives a nutty flavour; gives a crisp texture; plain has low gluten (no rise needed); plain as no raising agent is needed; provide extra nutrients e.g. NSP, vitamin B;	**2**
7(c)	*reason why cornflour is used for the shortbread* cornflour to give shortness; helps give a crisp texture to the baked product;	**1**

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Question	Answer	Marks
7(d)	*steps for making the shortbread dough using the rubbing-in method* sieve the flour and cornflour (include bran left in sieve); cut butter into cubes and add to flour; add sugar; (rub butter into flour) with fingertips; (rub butter into flour) until it is like breadcrumbs; knead dough until ingredients hold together;	**4**
7(e)	*spices that could be used to flavour the shortbread* allspice; cardamom; cinnamon; cloves; cumin; ginger; mixed spice; nutmeg; star anise / starfish spice; tamarind; turmeric; paprika; pepper; chilli;	**3**
7(f)	*ways the biscuits can be shaped before baking* piping the mixture; putting spoonfuls on the baking tray; roll into balls and shape; roll out and cut to shape with knife; use a mould / flan ring; using cutters;	**2**
7(g)	*reason for piercing shortbread with a fork* to prevent rising; ensure crispness;	**1**

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Question	Answer	Marks
7(h)	*reasons why shortbread biscuits should not be stored in a container with cakes* cakes are moist; biscuits will absorb moisture from cakes; texture of biscuits is traditionally crisp; texture of biscuits will become soft / soggy;	**2**
8	*rules for safe storage of kitchen knives* store away from the reach of children; store in a sheath / cover; store in a knife block / knife holder; store in a knife roll; store with a cork on the point; store on their own not mixed with other cutlery / don't leave sharp knives loose in a drawer; store in a box; store on a magnetic knife strip on the wall;	**4**
9	*guidelines to follow for the safe storage of raw chicken* ensure chicken is plucked and gutted before storage; store in a refrigerator (at a temperature of 1–8°C); store raw and cooked meat on different shelves in the refrigerator; store on the bottom shelf of the refrigerator; remove from original packaging and keep on a clean plate / dish loosely covered or wrapped / in a covered box; follow any instructions on the label; do not keep past use-by date; store in freezer as soon as possible/before use-by date (at temperature of –18°C to –21°C);	**4**
10(a)	*ways eggs may be used to make pastry products look attractive* acts as an adhesive for toppings / decorations e.g. pastry leaves / lattice effect; beaten whole egg / egg yolk brushed on surface as a glaze; egg white brushed onto surface then sprinkled with sugar for Maillard reaction; sliced arranged on top as a garnish;	**2**

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Question	Answer	Marks
10(b)	*dishes that use eggs for part of coating* cheese balls; chicken goujons / portion of crunchy or crispy fried chicken / aigre doux; croquettes; Dutch meatballs / Bitterballen; fish fingers / portions / fillets / cakes; fritters; rissoles; Scotch eggs;	**2**
10(c)	*why eggs are used for binding food products* when heated the protein in egg will set / coagulate / become solid or firm;	**1**
10(d)	*dishes which use eggs for binding* (beef) burgers; croquettes; falafel; fish cakes; marzipan; meatballs; rissoles; rubbed in mixtures e.g. rock buns, biscuits, sweet pastry; stuffing;	**2**
10(e)	*name and describe one test which can be used to tell if an egg is fresh* brine test; if the egg sinks it is fresh; if it floats on the surface it is stale; plate test; crack a whole egg onto a plate; if it is fresh, a lot of thick white will be seen making the yolk stand proud; if it is stale the white will be thinner and runny and the yolk will be lower; weight test; a fresh egg will feel heavy; a stale egg of the same size will feel much lighter;	**3**

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Question	Answer	Marks
11	*types of foods that should be avoided during pregnancy* raw / undercooked / cured meat; raw / undercooked / cured fish / shellfish / sushi; food made with unpasteurised milk such as cheese, yoghurt, goats cheese, ice cream; raw or partially cooked eggs / homemade egg dishes such as mayonnaise, mousse or ice cream; liver / liver products / products containing vitamin A / fish liver oils; shark / swordfish / marlin / tuna; pre-packaged salads (unless re-washed);	**4**
12(a)	*frozen peas* peas blanched in water at boiling point which kills microorganisms; blanching denatures enzymes; peas stored at temperature below –18ºC so water in cells frozen; water unavailable for growth of bacteria; bacteria are dormant at low temperatures;	**3**
12(b)	*jar of tomato chutney* tomatoes boiled which destroys microorganisms; enzymes destroyed by boiling; addition of sugar helps inhibit growth of microorganisms; addition of an acid / vinegar renders microorganisms unable survive as pH unsuitable; sterilised jar;	**3**

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Question	Answer	Marks
13	*Frying is a popular method of cooking. Discuss:* • *disadvantages of frying* • *safety points to follow when deep frying.* *disadvantages of frying [max 8 marks]* shallow and deep frying add fat / increase calorific value of product which can lead to obesity / CHD; needs constant attention during cooking / cannot leave unattended in case food overcooks / oil ignites; fried food may be difficult to digest so it may not be suitable for all members of the family; can be a dangerous process and needs skill; can be expensive to buy enough oil for deep fat pan; cannot cook large amounts at once; can be difficult to judge temperature of fat so if fat too hot food will be overcooked on outside and raw inside; can be difficult to judge temperature of fat so if fat too cool food will absorb oil / become soggy / unappetising; must strain oil when cool to remove crumbs of food which can decompose and give a bitter flavour or leave dark specks on food; destroys heat-sensitive nutrients; some methods require food to be turned or stirring to ensure even cooking; as fat / oil is expensive there is a tendency to use it too often with the result that tastes are absorbed by the fat and passed onto the food;	**15**

Question	Answer	Marks
13	*safety points when deep frying [max 8 marks]* do not leave unattended or have any distractions while frying as oil / fat in pan may ignite; do not move pan if on fire due to safety hazard for kitchen and chef; do not overfill pan with food or oil may overflow; do not overheat oil as it could catch on fire; dry food / equipment thoroughly before putting into fat preventing spitting / splutter; have lid / fire blanket / damp cloth nearby to cover pan and prevent oxygen reaching flames if it catches fire; pan handle turned in to avoid knocking over; pan not more than half full with oil to prevent overflowing when food is added; pan should be sturdy / have flat base so it does not wobble / use a wok cradle; lower food into pan carefully / do not throw food into pan to avoid splashing; turn heat off after use and do not move pan until oil is cold; turn heat off if oil begins to smoke due to fire/decomposition; use back burner if possible so less chance of being knocked over; use fat with high smoke point which will not decompose before correct temperature is reached; use thermostatically controlled electric fryer which controls temperature automatically; use correct size burner for pan / do not have flame spreading up sides of pan; have protective clothing and footwear / no long sleeves / hair tied up; use heat resistant utensils to prevent burning from conduction; do not use plastic equipment for turning food to avoid plastic melting; ensure adequate ventilation when frying so fumes are extracted and cook does not become faint;	

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Question	Answer	Marks
14	*Convenience foods are a popular choice when preparing meals. Discuss advantages of convenience foods for elderly people who live alone.* can buy in single-person portion sizes so suit people living on their own / good for portion control and less wastage of leftover uneaten food; different types of convenience foods come with storage instructions and can be safely stored in freezer, fridge or cupboard for longer than fresh food so useful for unforeseen circumstances meaning shopping can be done less often; foods are expertly cooked by manufacturer giving consistent quality and result; foods include cooking instructions which is helpful for less knowledgeable people; less clearing up / washing up / as little preparation and some can be cooked in and eaten from the container; less equipment needed for preparation / cooking e.g. pans, knives; less leisure time is spent in food preparation and cooking if people have busy lifestyles / still work; less wastage than making from scratch e.g. peelings, leftover ingredients; little preparation required as some products are ready to eat or cook so can be used by people with limited skills; may be cheaper than making a meal from scratch / no need to buy each separate ingredient; may have extra nutrients added which is good for people concerned with increasing a certain nutrient in their diet; foods may taste better than when made at home; many convenience foods simply need reheating and most people have access to microwaves to do this; often have nutrition labelling so planning balanced meals is easier; range for budget meals / meal deals so good value for elderly; range for healthy option if nutrition is a concern e.g. less fat / salt / sugar; readily available in many stores so easy to access; saves effort / not tiring / less use of personal energy in cooking and preparation; saves fuel energy due to fewer cooking processes / quick reheating; some companies deliver ready prepared meals so no need to go shopping; some specialise in different dietary needs / vegetarians / ranges for intolerance / allergy which are useful; suit lifestyles / likes and dislikes / enables independence; wide variety / selection of products / multicultural options available / can enjoy food from other countries/ eat foods out of season;	**15**

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