Cambridge Assessment International Education

Cambridge IGCSE™

FOOD & NUTRITION **0648/13**

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)	*define the term diet* food that a person eats every day;	**1**
1(b)(i)	*food avoided by a coeliac* gluten / wheat / rye / barley / oats;	**1**
1(b)(ii)	*food avoided by a person who is lactose intolerant* milk / dairy products;	**1**

Question	Answer	Marks
2(a)	*elements from which carbohydrate is formed* carbon; hydrogen; oxygen;	**2**
2(b)	*food that contains starch* cereals / one named example; flour / one named product made with flour e.g. pasta, bread, noodles; legumes / pulses / beans / peas / lentils / one named example; potatoes; root vegetables / one named example; sago; tapioca;	**3**
2(c)	*substance produced by the action of amylase on carbohydrate* maltose;	**1**
2(d)	*enzymes involved in the digestion of carbohydrate* maltase; lactase; sucrase; invertase;	**2**

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Question	Answer	Marks
3(a)	*effects on the body of vitamin C deficiency* anaemia; bleeding gums / tooth loss; connective tissue not maintained resulting in chicken skin where skin is bumpy / rough / dry; joint pain; lowered resistance to infection / poor immune system; poor wound healing; scurvy; tiredness / weakness / fatigue; walls of blood vessels weaken / bruising;	**3**
3(b)	*green leafy vegetables which are a good source of vitamin C* broccoli; Brussels sprouts; chard; chicory; Chinese leaves; cress; endive; kale; kohlrabi; lettuce; rocket; spinach; spring greens; watercress;	**4**
3(c)	*guidelines to conserve vitamin C when preparing cabbage for cooking* wash before cutting – so vitamin C does not leach from cut cells; tear instead of cutting – tear follows cell walls / does minimal damage / exposes less surface area to oxygen; do not shred thinly – less cell damage / less chance of oxidation; use a sharp knife – to prevent bruising cells; prepare just before cooking – vitamin C destroyed by enzymes from cell walls and by oxidation; do not soak – vitamin C is water soluble;	**4**

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Question	Answer	Marks
4(a)	*health benefits for adults of eating a variety of foods rich in NSP* absorbs water in colon which softens faeces making it bulky; stimulates peristalsis making it easier to expel waste regularly; reduces / lowers cholesterol; prevents constipation; helps reduce blood sugar; helps prevent hernia; helps prevent cancer of colon; helps prevents diverticular disease; helps prevents haemorrhoids; helps prevent varicose veins; helps to remove / absorb toxins; gives feeling of fullness / high satiety which limits intake of other nutrients;	**5**
4(b)	*four types of beans that could be added to a curry to increase NSP* adzuki beans; black beans / black turtle; black-eyed beans; borlotti beans / cranberry / Roman / romano / rosecoco; broad beans / fava; butter beans / lima; cannellini beans / white kidney; flageolet beans / fayot; garbanzo bean / chickpea; great northern bean; haricot beans / pearl / boston; navy bean / pea bean; red kidney beans; Lima beans; mung beans / green gram; pinto beans / specked / strawberry; red beans; soya beans / edamame;	**4**

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Question	Answer	Marks
4(c)	*effects on the body of eating too much NSP* may cause dehydration / excessive thirst; may aggravate irritable bowel syndrome; flatulence / wind / abdominal gas; diarrhoea; bloating; inability to absorb nutrients; cramping / stomach pain;	**3**

Question	Answer	Marks
5(a)	*effects of anaemia on the body* tiredness / fatigue / lethargy / lack of concentration / lack of energy; breathlessness; headache; palpitations; dizziness / faint; pale complexion; cold hands and feet;	**4**
5(b)	*why an anaemic person needs a daily supply of vitamin C* vitamin C is needed for the absorption of iron; vitamin C cannot be stored in the body; vitamin C is water soluble so is easily lost from the body;	**2**

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Question	Answer	Marks
6(a)(i)	*reasons why strong plain flour is used to make rough puff pastry* contains more gluten; pastry does not need to rise; flour is not the raising agent; helps the pastry have elasticity in order to flake or puff;	**2**
6(a)(ii)	*reasons why butter is used to make rough puff pastry* traps air in the layers / helps to form layers; helps achieve the flaky / airy texture; adds colour; adds flavour;	**2**
6(a)(iii)	*reason why lemon juice is used to make rough puff pastry* to strengthen the gluten; to make the gluten in the flour more elastic; gluten has to stretch in order to rise and form the structure of the flaky layers;	**1**
6(b)	*instructions for making rough puff pastry* chop butter into small even-sized pieces / lumps and add to flour; stir in lemon juice and water to form a dough; roll dough into long oblong strip taking care not to break up fat lumps; fold into three and keep corners square; seal edges with rolling pin / edge of hand; make a turn to the left; repeat rolling, folding and turning at least two more times; relax pastry in fridge, covered;	**6**

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Question	Answer	Marks
6(c)	*reasons why rough puff pastry may not rise well* butter too soft; so it broke up rather than help form air pockets; dough rolled too hard; air pressed out / lumps of fat squashed rather than help form air pockets; mixture was too dry; pastry not able to produce enough steam to expand layers; not allowed to rest in a cool / chilled place; butter has melted / gluten not allowed to develop; not sealed edges during rolling; air escaped; oven temp too cool / oven not hot enough / oven door opened constantly; butter melted before being absorbed by the starch / steam not produced quickly enough; pastry not been rolled and folded sufficient times during making; not enough air trapped; undercooked / not cooked for correct time; gluten not set in risen shape;	**6**
6(d)	*reasons why some people use ready-made pastry* saves time shopping for individual ingredients; saves time in making / less equipment / less washing up; useful for people who do not know how to make pastry / do not have skill to make pastry / pastry is too complicated to make; consistent quality / gives a good outcome every time; may be cheaper than buying all ingredients to make from scratch; can be stored for emergencies as frozen / packet mix; nutritional information on packaging; no waste of ingredients from left-over individual ingredients or if home-made outcome is unsuccessful; different varieties available so more variety cooking for family;	**5**

Question	Answer	Marks
7(a)	*reasons for using raising agents in cake mixtures* mixtures rise; mixture becomes light; improves texture / makes cakes less dense / cakes have open / spongy / airy / fluffy texture; products are easier to digest; products are more attractive / look better;	**4**

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Question	Answer	Marks
7(b)	*gases that cause cake mixture to rise* carbon dioxide; air; steam / water vapour;	**3**
7(c)	*ingredient that can be added as a raising agent to cake mixtures* baking powder; bicarbonate of soda / baking soda; cream of tartar; self-raising flour; yeast;	**1**

Question	Answer	Marks
8(a)	*methods that could be used to fry fish* air-fry; deep fry; dry fry; sautéing; shallow fry; stir-fry;	**3**
8(b)	*method of heat transfer used when frying fish* conduction / convection;	**1**
8(c)	*advantages of frying as a method of cooking fish* quick method of cooking / saves fuel; improves colour / gives fish an attractive appearance; crisp surface developed / texture improved; improves taste / flavour; aroma developed; improves satiety as fish absorbs fat which takes a long time to digest;	**3**

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Question	Answer	Marks
8(d)	*alternative methods of cooking fish* grill; oven bake; steam; microwave; poach;	**2**
9(a)	*guidelines, with reasons, for choosing kitchen knives* select a reliable brand / good quality / with a guarantee – to ensure value for money; choose variety of sizes / shape for different purposes e.g. peeling, chopping – different knives are suitable for different purposes; if not fully forged handle should be strong / firmly fixed / riveted / comfortable / easy-to-grip / well balanced – for safety and ease of use; blade should be rigid resist corrosion, staining, chipping – for safety / hygiene / long life; stainless steel knife – hard wearing long life / value for money; choose a blade which can be sharpened – for safe, efficient cutting and long usage; suitable price – to fit within a budget; colour of handle or blade – can be coded for specific foods to avoid cross-contamination; colour of handle or blade – can be coded for kitchen aesthetics; weight and balance of knife should be comfortable to hold and sit well in the hand – for safety and ease of use; a carving knife could be manual, electric or battery – dependant upon usage; avoid serrated knives – as they cannot be sharpened and they saw rather than slice so usually only suitable for slicing bread or baked products;	**6**

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Question	Answer	Marks
10	*Eggs are a very useful commodity to include in the preparation of meals. Discuss, with reasons, the following points:* • *nutritional benefits of including eggs in the diet* • *guidelines that should be followed when buying / storing eggs* *nutritional benefits [max 8 marks]* (HBV) protein; for growth / repair / maintenance / energy / hormones / antibodies / enzymes; fat; for energy / warmth / insulation / absorb vitamins A, D, E, K; folic acid; reproduction; iodide; production of thyroid hormones, functioning of thyroid gland / prevent goitre / energy metabolism / normal skin / nervous system function; iron; formation of haemoglobin / transport oxygen / release energy from glucose / prevent anaemia; phosphorus; works with calcium / formation and maintenance of bones and teeth / formation of protoplasm, cell membranes; vitamin A / retinol; normal growth of children particularly teeth and bones / prevent night blindness / visual purple / healthy skin / mucous membranes; vitamin B (riboflavin / thiamine / cobalamin / niacin); release energy from carbohydrates, amino acids and fats / growth / clear skin / prevention pernicious anaemia / health of nervous system / helps prevent beri-beri; vitamin D / cholecalciferol; absorption of calcium and phosphorous / formation of teeth and bones / helps prevent rickets, growth retardation, osteoporosis; vitamin E; antioxidant / helps prevent heart disease / aids fertility; vitamin K; healthy blood / coagulation of blood e.g. helps after injury; water; temperature maintenance / body fluids; *buying and storing eggs [max 8 marks]* check best before date to ensure eggs are as fresh / good quality as possible; check the eggs are not broken / cracked as bacteria may have entered the egg; shell should be clean as shells are porous and bacteria could enter; choose size suitable for use / dish to get a good outcome; free range eggs are more expensive but may be better quality / suit moral or ethical belief; fresh eggs should feel heavy for their size as this indicates the egg white has not evaporated;	**15**

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Question	Answer	Marks
10	store in cool place / fridge / out of sunlight to slow the growth of bacteria; store in a dry area as shells are porous; store with pointed end down / blunt end upwards to keep yolk in centre; do not wash as this will remove the protective coating; store in the box / carton / tray / rack to prevent accidents; store away from strong smelling foods due to porous shells; store away from meat and fish to avoid cross-contamination; practise stock rotation to ensure freshness;	

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Question	Answer	Marks
11	*Milk is a very useful commodity to include in the preparation of meals. Discuss:* • *the nutritional benefits of including milk in the diet* • *processing of milk by pasteurisation and the effect it has on the sensory quality of the milk* • *processing of milk by ultra-heat treatment (UHT) and the effect it has on the sensory quality of the milk.* *nutritional reasons [max 8 marks]* calcium for formation and maintenance of bones / teeth / nails / muscle function / function of nerves / blood clotting; carbohydrate in form of sugar / lactose for energy; fat for warmth / energy / protection internal organs; phosphorus for bones / teeth / energy release; potassium for muscle function; (HBV) protein for growth / repair; vitamin A / retinol for production of visual purple in retina of eye / helps vision in dim light / at night / prevents night blindness / formation of mucous membranes / required to keep mucous membranes moist and free from infection / healthy skin / antioxidant / required for growth; vitamin B / B_1 (thiamine) / B_2 (riboflavin) for production of energy from carbohydrate / fats / proteins / growth / function / maintenance of nerves; vitamin D (cholecalciferol) formation of bones and teeth / promotes quicker healing of bone fractures / helps absorption of calcium in the small intestine / required for blood clotting; *pasteurisation [max 4 marks]* pasteurised milk is heated to 72 °C (by flash process or HTST); pasteurised milk is heated (to 72 °C) for 15 seconds; pasteurisation destroys some but not all spoilage / souring bacteria; pasteurised milk has a shelf life of between 7–10 days; pasteurised milk must be kept refrigerated / chilled; pasteurised milk is packed in glass or plastic bottles; pasteurising milk does not alter sensory qualities of milk; *UHT [max 4 marks]* UHT milk is heated to 132 °C; UHT milk is heated (to 132 °C) for 1 second; UHT process destroys all spoilage / souring bacteria; UHT milk has an extended shelf life / lasts for several months; UHT milk can be stored at room / ambient temperature; UHT milk is packed in foil-lined containers; UHT may cause sensory alterations due to Maillard reaction;	**15**

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