Cambridge Assessment International Education

Cambridge IGCSE™

FOOD AND NUTRITION **0648/12**

Paper 1 Theory **May/June 2023**

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 May/June 2023 series for most Cambridge IGCSE, Cambridge International A and AS Level and Cambridge Pre-U 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	'List rule' guidance 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.

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	*term used to describe a diet that contains all nutrients in the correct proportion* balanced (diet);	**1**

Question	Answer	Marks
2(a)	*mineral that helps to reduce blood pressure* potassium;	**1**
2(b)	*herbs that could be used to flavour a tomato-based sauce* basil; bay; chervil; chives; cilantro; coriander; curry leaves; dill; mint; oregano; parsley; rosemary; sage; tarragon; thyme;	**4**

Question	Answers	Marks
3(a)	*examples of disaccharides* maltose; lactose; sucrose;	**2**

Question	Answer	Marks
3(b)	*effects of moist heat on sugar* dissolves / melts / becomes liquid; becomes syrup / sticky; changes colour / turns brown / darkens; caramelises; prolonged heating will cause it to burn;	**3**

Question	Answer	Marks
4(a)	*type of fat that does not contain carbon-to-carbon double bonds* saturated;	**1**
4(b)	*different foods that are a good source of the type of fat in* ***(a)*** (full fat) milk or one named product e.g. butter / ghee, cheese, cream, yogurt; (red) meat / one named example / meat products e.g. pies, sausages; biscuits / cakes / pastries or one named example; cocoa butter; coconut oil; dripping; egg (yolk); fish liver oil / oily fish / one named example; lard; milk; palm oil; suet;	**3**
4(c)	*name of the substance that emulsifies fat* bile;	**1**

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Question	Answer	Marks
5(a)	*functions of vitamin B_2 (riboflavin)* antioxidant / helps immune system / fights free radicals; maintenance / repair of the nails / skin / hair / mucous membranes including digestive system; normal growth; prevents conjunctivitis; prevents dermatitis; prevents mouth, lips, tongue swelling and soreness; production of red blood cells / haemoglobin; release energy from food / carbohydrate / protein / fat;	**2**
5(b)	*health problems caused by a deficiency of vitamin B_2* burning / itching / reddening of the cornea; cracks at corners of mouth; eyes sensitive to light; inflammation of mouth and throat / sore throat; oily dermatitis affecting the nose / cheeks / forehead; slow growth / retarded growth / failure to grow; swollen / sore / burning lips; swollen tongue / glossitis; tiredness / fatigue / lack of energy; weakened immune system;	**3**

Question	Answer	Marks
6(a)	*deficiency disease caused by a poor supply of vitamin C* scurvy;	**1**

Question	Answer	Marks
6(b)	*guidelines to reduce loss of vitamin C when cooking cabbage* do not boil cabbage / do not cook in water – vitamin C is water-soluble it will leach into water; if boiling, use small amount of water for cooking - vitamin C is water-soluble it will leach into water; if boiling, boil water first – veg in cooking water for minimal time so less leaching; keep lid on pan – to prevent oxidation; do not overcook – vitamin C is destroyed by heat / heat sensitive; do not add bicarbonate of soda – it is alkaline and destroys acidic vitamin C; stir frying / air-frying – quick cooking methods which ensures less destruction of vitamin C by heat; steam / stir-fry / microwave / air-fry cabbage – little / no use of water in these methods so less chance of dissolving water-soluble vitamin C;	**10**

Question	Answer	Marks
7(a)	*drink lots of fluids especially water* breastfeeding can make mother feel thirsty / will help to produce milk / prevents dehydration / keeps mother hydrated;	**1**
7(b)	*eat no more than two portions of oily fish per week* oily fish can contain low levels of pollutants / mercury that can build up in the body and may be passed to baby in breast milk;	**1**
7(c)	*eat a diet rich in calcium* to prevent the mother from suffering from osteoporosis in later life as calcium may be drawn from her bones during lactation / provide baby with breast milk rich in calcium for development of bones / teeth / prevent rickets;	**1**
7(d)	*eat a diet rich in iron* produce red blood cells / to prevent the mother from suffering from anaemia / top up supply of iron for baby;	**1**
7(e)	*eat a diet rich in vitamin D* to prevent the mother from suffering from osteoporosis in later life / to help with absorption of calcium;	**1**
7(f)	*eat an average of an extra 300 to 400 kcal per day* breastfeeding uses up calories so appetite can be greater than normal / makes up for energy lost feeding baby as lactation requires a lot of energy / eating more calories than required may cause weight gain and associated problems / eating less calories than required may cause weight loss and associated problems;	**1**

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Question	Answer	Marks
7(g)	*eat a diet rich in fibre* fibre can help with constipation and other bowel problems that are common after birth;	**1**
7(h)	*reason why lactating women are often advised to check labels on processed foods* processed foods may contain additives which may be passed onto the baby via breast milk / drinks containing high amounts of caffeine are not recommended for lactating women;	**1**

Question	Answer	Marks
8(a)	*ingredient in the recipe which provides the most energy* butter;	**1**
8(b)	*other ways to vary the flavour of the cake mixture* use wholemeal flour / almond flour; add coconut / chopped nuts or named e.g. almonds; add dried fruit or named e.g.raisins; add fruit fresh / canned or named suitable e.g. (blueberries / raspberries / blackcurrants / cranberry); add vegetables / carrot / courgette etc.; add cocoa powder / grated chocolate / chocolate chips; add coffee flavouring; add essence such as lemon, orange, vanilla, almond etc.; add zest e.g. lemon, orange;	**2**
8(c)	*instructions how to make the cake mixture using the creaming method* cream / beat butter and sugar; cream with wooden spoon / electric mixer; cream until light and fluffy / pale colour / white / creamy; beat eggs; add beaten eggs gradually / slowly to creamed mixture; beat well between each addition; sieve flour; fold flour into mixture (gently); use metal spoon to fold in;	**6**

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Question	Answer	Marks
8(d)	*ingredient in the mixture that causes coagulation to occur during baking* egg;	**1**
8(e)	*ingredient in the mixture that causes dextrinisation to occur during baking* flour;	**1**
8(f)	*ingredients that cause the Maillard reaction to occur during baking* flour / egg; sugar;	**2**
8(g)	*effects of Maillard reaction on the finished cakes* causes browning / colour becomes golden brown / non-enzymic browning occurs; produces pleasant flavour; produces appetising aroma;	**2**
8(h)	*method of heat transference used when the cakes are baking in the oven* conduction / convection / radiation;	**1**
8(i)	*reasons why the cakes may have a close, heavy texture after baking* mixture curdled; mixture over beaten when adding flour / over-mixing; flour out-of-date / flour damp; not enough creaming; oven temperature too low; cake not cooked for long enough / incorrect baking time; flour not sieved; oven door opened too much before cakes set;	**4**
8(j)	*reason it is important to use a wire rack to cool cakes* allows air to circulate around cake so cake can cool evenly / faster; allows steam to escape so that it does not condense in cake making it soggy;	**1**

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Question	Answer	Marks
8(k)	*how the cakes should be stored to keep them in good condition* store in an airtight / sealed / covered container; wrap in foil / cling film; store in a cool place; store in a dry place; store in a clean place;	**2**

Question	Answer	Marks
9(a)	*religion associated with eating kosher food* Jewish;	**1**
9(b)	*religion associated with eating fish on Friday* Catholic / Christian;	**1**
9(c)	*religion associated with fasting during Ramadan* Muslim / Islam;	**1**

Question	Answer	Marks
10(a)	*mineral found in seaweed* iodide / iron / calcium / sodium (salt) / potassium;	**1**
10(b)	*vitamin found in rice* vitamin B / vitamin B_1 (thiamin) / vitamin B_2 (riboflavin) / vitamin B_3 (niacin/nicotinic acid) / vitamin B9 (folate);	**1**
10(c)	*reasons why cooked rice is considered a high-risk food for food poisoning* bacteria can easily multiply and grow / can contain spores of bacillus cereus (survive even after cooking); cooked rice has a high moisture content; cooked rice has a high protein content; cooked rice has a short shelf life;	**2**
10(d)	*storage temperature for sushi* range of 1ºC–8ºC;	**1**

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Question	Answer	Marks
10(e)	*shellfish that can be used to make sushi* abalone; clam / geoduck; cockles; crab; crayfish; cuttlefish; langoustine / scampi; lobster; mussels; octopus; oyster; prawns; scallops; sea urchin; shrimp; squid / kanava / calamari;	**3**

Question	Answers	Marks
11(a)	*conditions required for yeast to ferment* warmth / room temperature; moisture; food; time;	**2**
11(b)	*gas yeast produces during the process of fermentation* carbon dioxide;	**1**

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Question	Answer	Marks
12(a)	*other materials that can be used to package convenience food* ceramic / china; glass; metal / steel / aluminium; paper / paperboard / cardboard;	**2**
12(b)	*reasons why plastic is a suitable material for packaging convenience food* can be coloured; can be fused to seal / made airtight; can be moulded into different shapes; can be printed on so no label needed; can be rigid or flexible; can be used in freezer / resistant to low temperatures; can be used in microwave / oven / can be cooked in; cheap in comparison to metal, glass; lightweight; recyclable; resistant to moisture / impermeable; thin but very strong / durable; transparent / see through / can see contents;	**6**

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Question	Answer	Marks
13	*Fats and oils are an important commodity.* *Discuss the uses of fats and oils in the preparation and cooking of family meals.* *Discuss ways to reduce saturated fat intake when preparing and cooking family meals.* *uses of fats and oils in family meals [8 marks max]* aeration fat traps air when creamed with sugar in cake-making / when rubbing in with flour for shortcrust pastry; anti-staling, improves keeping quality / shelf life of rich cakes, e.g. Christmas cake remains moist; as an ingredient in dressings such as French dressing / provides a temporary emulsion; basting with fat adds moisture to meat cooked by dry heat / grilled / roasted; decorating as in butter icing; fats and oils add colour when fried food becomes golden / in cakes / pastries / caramelising; fats and oils add flavour such as butter used in cake / pastry making spread on bread / sesame oil when stir-frying / butter in mashed potato; fats help develop flakiness when making flaky or puff pastry or biscuits; form a permanent emulsion by mixing together two ingredients which would not normally combine as in mayonnaise / ice-cream / creamed mixture; frying food in fat or oil as a method of cooking, stir, sauté, shallow, deep; gives a glossy appearance / creamy texture as when making a sauce; glazes food and gives a glossy appearance such as melted butter on asparagus, new potatoes, carrots; lubricates dry food such as spreading on bread / toast / crackers making them easier to eat and swallow; prevents sticking on cake tins when brushed before baking / when cooking pasta; sealing or preservation when using melted butter / margarine on pate to retain moisture; shortening, the fat gives product ‘short’ crumbly texture of shortcrust pastry / rock buns;	**15**

Question	Answer	Marks
13	*reduce saturated fat intake [8 marks max]* don't add extra fat to food e.g. glazing vegetables with butter / mashing potatoes with butter and cream; flavour foods with herbs and spices instead of sauces containing butter; grill / bake / poach / steam/microwave / stir-fry/ air-fry rather than fry / roast to prevent addition of extra saturated fat; have pies with only one crust rather than two (either a lid or a base); use less meat in casseroles and stews / eat smaller portions of red meat / add extra vegetables / pulses / TVP/ Quorn; when making sandwiches spread butter thinly or use unsaturated spread; eat red meat only occasionally / eat fish, poultry, pulses, TVP, Quorn etc. in place of red meat; read labels carefully to check saturated fat content; increase consumption of home-made meals / reduce consumption of ready-made or processed meals which may have high saturated fat content; use vegetable oils such as sunflower or olive oil instead of saturated fats such as butter / lard / dripping; replace cream or soured cream with yoghurt / fromage frais / crème fraîche in recipes; choose low-fat versions of dairy products like milk / cheese / yoghurt / cream; select lean cuts of meat to avoid unnecessary saturated fat; trim off any visible fat from meat / remove skin from poultry to avoid including saturated fat; do not fry foods in lard / butter / dripping use plant oils (or named e.g. sunflower oil); eat fewer eggs as these are high in saturated fat;	

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Question	Answer	Marks
14	*can be made when preparing family meals to help minimise the risk of developing constipation.* *cause and effect of constipation [max 8 marks]* *causes* caused by deficiency / poor supply / lack of foods providing NSP; NSP is required to remove waste products / faeces from the body; caused by deficiency / poor supply / lack of water; water adds bulk to stools making bowel movements softer and easier to pass; excess caffeine may cause dehydration which impacts upon inability to remove faeces; excess intake of dairy foods may lead to constipation; certain types of medication may cause constipation; changes in routine / lifestyle / eating habits may cause constipation; immobility may cause constipation; pregnancy may cause constipation; stress / anxiety / depression may cause constipation; *effects* constipation may lead to abdominal pains and bloating caused by faecal impaction; constipation can lead to haemorrhoids / piles / rectal bleeding / anal fissures; constipation can lead to diverticular disease / bowel disorders / bowel cancer;	**15**

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Question	Answer	Marks
14	*modifications [max 8 marks]* choose high fibre breakfast cereals which provide a good source of NSP; choose wholemeal bread instead of white bread which provides a good source of NSP; choose brown rice instead of white rice which provides a good source of NSP; choose wholewheat pasta instead of white pasta which provides a good source of NSP; adds seeds such as sunflower, sesame, pumpkin to dishes to increase NSP; add nuts such as almonds, walnuts to dishes to increase NSP; substitute wholemeal / oat flour for up to half of the flour in recipes to provide additional NSP; add pulses to dishes to provide a good source of NSP; eat a variety of fruit which provide a good source of NSP; eat a variety of vegetables which provide a good source of NSP; avoid processed / convenience food as it can be low in NSP; eat potatoes / carrots / apples with skins to provide a good source of NSP; eat a variety of vegetables which provide a good source of water; eat a variety of fruit which provide a good source of water; drink plenty of fluid, (2–4 litres), per day to aid removal of waste; increase intake of fluid if participating in vigorous exercise inducing sweating / live in a hot climate so lost fluid is replaced; caffeine can be dehydrating so reduce intake; reduce intake of dairy foods;	

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