



**Cambridge Assessment International Education**  
Cambridge International General Certificate of Secondary Education

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**FOOD AND NUTRITION**

**0648/13**

Paper 1 Theory

**May/June 2018**

MARK SCHEME

Maximum Mark: 100

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**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.

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**PUBLISHED****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.

**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.

Question	Answer	Marks
1	<i>why energy input and energy output should be the same</i>  to maintain energy balance; to prevent obesity (by over-consumption); to prevent weight loss (by under-consumption);	1

Question	Answer	Marks
2(a)	<i>functions of protein</i>  growth; repair; maintenance / renewal; energy; manufacture of antibodies / enzymes / hormones; catalyse reactions in the body;	3
2(b)	<i>disease caused by a deficiency of protein</i>  marasmus / kwashiorkor;	1

Question	Answer	Marks
3	<i>mineral or vitamin for different functions</i>  (a) vitamin C; (b) iron; (c) vitamin K / calcium; (d) iodide (e) calcium / vitamin D / phosphorus; (f) vitamin B <sub>12</sub> / cobalamin; (g) fluoride; (h) vitamin A;	8

Question	Answer	Marks
4	<p><i>structure and function of the ileum</i></p> <p>it is the longest part of the small intestine / between 2–4 metres long;            ileum wall is made up of folds;            folds have many tiny finger-like structures known as villi on the surface;            each villus has a small lymph vessel / lacteal and a network of capillaries / blood vessels in the centre;            partly digested food is pushed along the ileum by waves of muscle contractions called peristalsis;            most absorption happens in the ileum;            the capillaries transport glucose and amino acids;            the lacteal transports fatty acids and glycerol;</p>	<b>4</b>

Question	Answer	Marks
5(a)	<p><i>health risk that could result from having too much salt in the diet</i></p> <p>high blood pressure / hypertension;            stroke;            heart disease;            kidney damage;</p>	<b>1</b>

Question	Answer	Marks
5(b)	<p><i>herbs which could be used to flavour food instead of salt</i></p> <p>basil;            bay;            parsley;            mint;            chervil;            dill;            sage;            thyme;            tarragon;            coriander;            chives;            curry leaves;            cilantro;            rosemary;</p>	3

Question	Answer	Marks
6(a)	<p><i>benefits of stir-frying</i></p> <p>quick method of cooking;            food is cooked quickly so fat soluble vitamins are retained;            it is healthy as cooked in small amount of oil;            energy efficient as only one ring / burner used;            less washing up as only one pan used;            flavour of food developed;            makes food appetising / maintains colour of food;            provides texture to meal as vegetables stay crunchy;            appetising smell;</p>	4

Question	Answer	Marks
6(b)	<p><i>rules to follow to avoid accidents when stir-frying</i></p> <p>prepare all ingredients before starting to stir-fry;  make sure food / equipment is dry before adding to pan;  do not use too much oil;  use oil with high smoking point;  do not leave pan / wok unattended whilst heating oil / cooking;  maintain careful temperature control whilst cooking;  ensure pan / wok is stable on hob / use a wok cradle;  keep handle of pan / wok facing away from edge / not over another burner;  hold handle of pan / wok;  use heat resistant utensils for stirring;</p>	4

Question	Answer	Marks
7(a)	<p><i>how sugar can cause tooth decay</i></p> <p>bacteria in the mouth combine with sugar and saliva to form plaque;  plaque is a sticky film that coats the teeth;  sugar is absorbed into plaque on teeth;  sugar is turned into acid;  pH of plaque falls below 5.5;  tooth enamel dissolves;  weak area is left;  cavity develops;  plaque and bacteria can reach the dentine and pulp in the tooth;  whole tooth damaged / irreplaceable / may have to be extracted;</p>	4

Question	Answer	Marks																		
7(b)	<i>different uses of sugar in the preparation of dishes</i>	7																		
	<table border="1"> <thead> <tr> <th>use of sugar</th> <th>example</th> </tr> </thead> <tbody> <tr> <td><b>increasing energy value</b></td> <td><b>drinks for athletes</b></td> </tr> <tr> <td><b>confectionery</b></td> <td>toffee / fondant / caramel;</td> </tr> <tr> <td><b>aerating</b></td> <td>meringues / creaming rich cakes / whisking Swiss roll;</td> </tr> <tr> <td><b>sweetening</b></td> <td>beverages / sauces / desserts / cakes / biscuits;</td> </tr> <tr> <td><b>preservation</b></td> <td>jam / marmalade / canned fruit;</td> </tr> <tr> <td><b>decoration</b></td> <td>royal icing / butter icing / fondant icing / powdered sugar on top of cakes / sieved icing sugar;</td> </tr> <tr> <td><b>glazing</b></td> <td>sugar and water boiled for sweet breads;</td> </tr> <tr> <td><b>improving colour</b></td> <td>cakes with brown sugar / sugar caramelises in dry heat of oven;</td> </tr> </tbody> </table>	use of sugar	example	<b>increasing energy value</b>	<b>drinks for athletes</b>	<b>confectionery</b>	toffee / fondant / caramel;	<b>aerating</b>	meringues / creaming rich cakes / whisking Swiss roll;	<b>sweetening</b>	beverages / sauces / desserts / cakes / biscuits;	<b>preservation</b>	jam / marmalade / canned fruit;	<b>decoration</b>	royal icing / butter icing / fondant icing / powdered sugar on top of cakes / sieved icing sugar;	<b>glazing</b>	sugar and water boiled for sweet breads;	<b>improving colour</b>	cakes with brown sugar / sugar caramelises in dry heat of oven;	
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Question	Answer	Marks
8(a)	<i>reasons for eating a healthy breakfast</i>	4
	<p>provides the body with energy and nutrients after an overnight fast;  eating carbs for breakfast provides energy;  replenishes blood sugar needed to make your muscles and brain work;  eating breakfast may mean daily requirements of nutrients are provided;  can prevent snacking on foods high in fat and sugar / more likely to overeat later in the day;  kick-starts metabolism / helps burn calories throughout the day / have energy all day;  can reduce obesity / high blood pressure / heart disease / diabetes;  can improve memory / concentration levels;  breakfast is a social occasion / chance to eat together as a family;  eating breakfast as a child develops good eating habits that last a lifetime;</p>	



Question	Answer	Marks
8(b)(i)	<p><i>coagulation</i></p> <p>heat on protein / egg at 60 °C; chemical structure changed which cannot be reversed; causes hardening / setting; protein denatures; overheating causes protein to shrink – e.g. syneresis when scrambled egg is overcooked;</p>	2
8(b)(ii)	<p><i>dextrinisation</i></p> <p>dry heat on starch / bread; when toasted starch changes to dextrin; surface changes to golden brown colour;</p>	2
8(b)(iii)	<p><i>vitamin not present in the meal</i></p> <p>vitamin C;</p>	1
8(b)(iv)	<p><i>foods which could be added to provide vitamin C</i></p> <p>citrus fruit / 1 named example / orange juice; blackcurrants; kiwi fruit; strawberries; mango; green peppers; tomatoes; green vegetables / 1 named suitable example;</p>	2
8(b)(v)	<p><i>why a person with coeliac disease could not eat the scrambled egg on toast</i></p> <p>intolerance to <u>gluten</u> (a protein) found in wheat;</p>	1

Question	Answer		Marks
8(c)	function of eggs in cooking	name of dish	5
emulsification	mayonnaise; salad cream; salad dressings; creamed mixtures;		
glazing	pastries; scones; bread / rolls; biscuits; cookies;		
binding	meatballs; fish cakes; beef burgers; stuffing; pastries; marzipan;		
coating	fish / chicken portions / in bread-crumbs; fish cakes; potato cakes / croquettes; scotch eggs; fritters; onion rings;		
garnishing	salads / boiled eggs in salad; egg fried rice; crab; pasta dishes;		

Question	Answer	Marks
8(d)	<p><i>points, with reasons, for storing eggs</i></p> <p>store in box / shaped door compartment to prevent damage;  blunt end up / pointed end down to keep yolk in centre;  0–5 °C / in refrigerator / cool / room to slow down bacterial growth;  store away from strong smelling foods as porous shell absorbs odour;  store away from raw meat fish to avoid cross contamination;  rotate stock / check best before dates to prevent staling;  do not store cracked eggs as there is more danger of cross contamination;  do not wash as this removes protective covering on shell;  do not store if shell is broken as bacteria will enter;</p>	8

Question	Answer	Marks
9(a)	<p><i>stages to make blended sauce</i></p> <p>blend sugar and cornflour to a smooth paste with small quantity of milk;  heat remaining milk;  pour heated milk on to blended ingredients;  pour mixture back into pan and stir till thickened;</p>	4
9(b)	<p><i>how the sauce thickens</i></p> <p><u>heat</u> (approx 60 °C) on <u>starch</u> grains cause them to soften;  <u>stirring</u> keeps the starch grains suspended;  <u>starch</u> grains <u>swell</u> as they <u>absorb</u> liquid;  starch grains <u>burst</u> as heating continues (approx 80 °C);  the sauce thickens;  <u>gelatinisation</u> is completed when the liquid reaches 100 °C;  the liquid forms a gel which solidifies on cooling;</p>	4

Question	Answer	Marks
10(a)	<p><i>conditions necessary for the growth of microorganisms</i></p> <p>warmth; moisture; food; time; oxygen / lack of oxygen; correct pH;</p>	<b>3</b>
10(b)	<p><i>rules for personal hygiene to prevent the transfer of food poisoning bacteria</i></p> <p>do not prepare food when suffering from chest infection / vomiting / diarrhoea; do not cough / sneeze over food; wear appropriate clean clothing to prepare food; hair must be tied back; short nails; cover cuts with a (blue) waterproof plaster; wash hands before touching food / after going to the toilet / touching rubbish bins; do not wearing nail varnish / jewellery; do not lick utensils and put them back into the food;</p>	<b>5</b>
10(c)	<p><i>disposing of kitchen waste</i></p> <p>if available use a kitchen waste disposal unit; recycle paper / glass / metal / food waste if possible; empty all bins regularly / do not allow bin to overflow; organic / food waste for compost; wash / disinfect all bins regularly; line bin with plastic bin liner; wrap all waste / do not put liquids in the bin; tie bags before disposing in outside bin; cover bin tightly / clear up spills to prevent attracting flies / vermin; keep outside bin away from any open windows so flies do not get into house; do not pour fat down drains because drains get blocked when fat hardens;</p>	<b>4</b>

Question	Answer	Marks
11(a)	<p><i>Discuss reasons why convenience foods are an advantage to a modern family</i></p> <p>saves effort / energy / not tiring;  easy to prepare / use / some foods are ready to eat or cook;  convenience foods are quick / save time / busy lifestyles little cooking or preparation needed;  less clearing up / washing up / can be cooked in and eaten from the container;  some specialise in different dietary needs / ranges for intolerance / allergy;  can be used by people with limited skills;  useful for can't / won't cook;  convenient for social / special occasions;  wide selection of multicultural options available / can enjoy food from other countries;  foods expertly cooked by manufacturer;  may taste better than when made at home;  some products might be too complicated to prepare;  saves fuel energy due to fewer cooking processes / quick reheating;  may be cheaper than making a meal from scratch / no need to buy each separate ingredient;  less wastage than making from scratch;  less equipment needed;  may have extra nutrients added / nutritive value is maximised eg peas freshly picked and frozen;  may include cooking instructions;  lifestyle differences enables families eat at different times / can buy in one portion sizes;  likes / dislikes of family members can be easily catered for;  good range / variety of products available;  saves time shopping for ingredients;  shopping can be done less often due to easier storage of ready prepared foods;  can be stored / longer shelf life than fresh;  families have freezers for easy / safe storage of food;  families have microwaves for easy reheating of food;  often have nutrition labelling for information;  range for healthy option;  range for budget meals / meal deals;  consistent quality / result;  can be used as components of meals;  can be used in emergencies;</p>	15

Question	Answer	Marks
11(b)	<p><i>Discuss factors which need to be considered to minimise the risk of the following dietary related disorders in the elderly:</i></p> <ul style="list-style-type: none"> <li>• <i>obesity;</i></li> <li>• <i>osteoporosis.</i></li> </ul> <p><b>obesity</b></p> <p>energy intake should equal energy expenditure / low energy foods as less active;  small portions as appetite reduces with age / prevent overeating;  eat regular meals / don't graze / skip meals which could lead to overeating later;  eat fatty food in moderation it is energy dense and unless used will be stored as body fat;  opt for low fat versions of food to reduce risk of obesity;  replace red meat with chicken / white meat / white fish;  drain away excess fat when cooking;  remove visible fat from food like bacon / use lean meat;  eat less dairy foods such as cheese, cream, butter;  only fry foods occasionally / dry fry / grilling to prevent addition of excess fat;  steam / boil / poach / bake food as less added fat;  include vitamin B to release energy from carbohydrates;  reduce sugar intake to reduce extra calories / use sugar substitutes as excess will be stored as body fat;  reduce intake sweets / chocolates / biscuits / cakes to reduce calories which may turn to stored fat;  more fruit and veg / eat 5 day to prevent filling up on inappropriate / starchy / fatty / sugary food;  cook meals from scratch so being aware of ingredients / cooking processes;  read food labels to check for nutritional / energy content;  reduce intake of processed / convenience / takeaway foods which may be high in fat / sugar / low in NSP;</p>	15

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Question	Answer	Marks
11(b)	<p><b>osteoporosis</b></p> <p>in post-menopausal women there is acceleration in bone loss so they are more in need;  eat foods high in calcium;  calcium is necessary for the maintenance of bones;  calcium helps to prevent weak / brittle bones / osteoporosis;  sources of calcium are milk – cheese – yoghurt – bones of canned fish e.g. salmon – prawns – dried fruit – hard water – green vegetables (or named e.g.) – wholegrain cereals – nuts (or named e.g.) – pulses (or named e.g.) – Kombu / nori seaweed – sesame seeds;  eat foods high in vitamin D (cholecalciferol) ;  vitamin D helps the absorption of calcium in the body;  vitamin D helps to prevent osteoporosis;  sources of vitamin D are liver – fish liver oils (or named e.g.) – oily fish (or named e.g.) – yoghurt – eggs – margarine – milk – cheese – butter – red meat – cream;  exposure to sunlight / ultra violet light is essential for the synthesis of vitamin D;  elderly who are housebound may lack vitamin D as they have limited exposure to sunlight;  phosphorous combines with calcium to produce calcium phosphate which is necessary for bone strength;  phosphorus is necessary to prevent weak / brittle bones / osteoporosis;  sources of phosphorus include most proteins;  vitamin K is needed to maintain proper bone density and so reduce the risk of osteoporosis;  vitamin K helps in binding of calcium in bone structure / helps absorption of calcium in bones;  sources of vitamin K are leafy green veg – fruit – cereals – meat – liver – kelp – alfalfa – egg (yolks) – polyunsaturated oils – fish liver oils – asparagus;</p>	