



FOOD AND NUTRITION

0648/13

Paper 1 Theory

October/November 2019

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.

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This document consists of **16** printed pages.

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(a)	<i>define the term overnutrition</i> consumption of excess food / too much of one or more nutrients;	1
1(b)	<i>common result of overnutrition</i> obesity;	1

Question	Answer	Marks
2(a)	<i>functions of proteins</i> growth; repair; energy; renew cells in the body as they wear out / maintenance; production of antibodies / enzymes / hormones; facilitates transport in the body, e.g. haemoglobin is a transporting protein which carries oxygen;	4
2(b)	<i>why some proteins have a lower biological value than others</i> lack one or more / they are incomplete; EAA / IAA; They are from plant source of protein;	2
2(c)	<i>sources of low biological value protein</i> pulses or named example e.g. peas / beans / lentils; legumes e.g. snow peas / long or green beans / French beans; cereals or named example; nuts or named example; gelatine; seeds or named example;	3

Question	Answer	Marks
2(d)	<i>enzymes that break down protein</i> pepsin; trypsin; chymotrypsin; rennin;	2

Question	Answer	Marks
3(a)	<i>define the term monosaccharide</i> simple sugars / simplest form of carbohydrate / smallest unit of carbohydrate; end product of digestion of carbohydrate; single unit carbohydrate base for other carbohydrates;	1
3(b)	<i>examples of monosaccharides</i> glucose; fructose;	2

Question	Answer	Marks
4(a)	<i>alternative name for vitamin B₁</i> thiamin;	1
4(b)	<i>vitamin B₁ deficiency disease</i> beriberi;	1

Question	Answer	Marks
4(c)	<p><i>sources of riboflavin</i></p> <p>avocado; beef / pork / bacon / ham; cereal products or named example, e.g. bread / pasta / cakes; cereals especially wholegrain / wholemeal; dairy foods or named example, e.g. milk, cheese; eggs; fish / seafood / fish roe; green veg or named example, e.g. asparagus / broccoli / spinach / peas; mushrooms; nuts; offal or named example, e.g. liver / kidney; potatoes; pulses or named example; rosehips; seeds; tofu; wheat germ / bran;</p>	2
4(d)	<p><i>alternative name for Vitamin B₃</i></p> <p>nicotinic acid;</p>	1
4(e)	<p><i>effects on health of a prolonged deficiency of Vitamin B₃</i></p> <p>pellagra; diarrhoea; dermatitis; dementia;</p>	2

Question	Answer	Marks
5	<i>factors which affect the energy needs of a person</i> activity; age; climate; gender; occupation / work; pregnancy / lactating; state of health / illness / disease / health condition;	5

Question	Answer	Marks
6(a)	<i>formation of blood cells</i> iron;	1
6(b)	<i>production of visual purple</i> vitamin A / retinol;	1
6(c)	<i>helps wounds heal</i> vitamin C / ascorbic acid / vitamin K;	1
6(d)	<i>aids the absorption of calcium</i> vitamin D / cholecalciferol / phosphorus;	1
6(e)	<i>production of the hormone thyroxine</i> iodide;	1
6(f)	<i>prevents megaloblastic anaemia</i> B ₁₂ / cobalamin;	1

Question	Answer	Marks
7	<p><i>describe the structure of the ileum</i></p> <p>at one end ileum is attached to the jejunum / middle section of the small intestine; at the other end ileum is attached to the colon; ileum is longest part of the small intestine; between 2–4 metres long; inside wall is thin / one cell thick; has muscular walls comprised of folds; has a large internal surface area; surface of each of the folds has small finger-like villi; villi are covered with epithelial cells; in centre of each villus is a lacteal; the lacteal is surrounded by blood capillaries; the lacteal is connected to the lymphatic system / hepatic portal vein;</p>	6

Question	Answer	Marks
8(a)	<p><i>identify and explain dietary reasons to include fresh fruit in the diet each day</i></p> <p>help contribute to a balanced diet / 5 a day / following nutritional tools; intrinsic / natural sugar less damaging to teeth / helps prevents dental caries; less risk of obesity as fruit is almost fat-free; high in fibre / NSP gives feeling of satiety which will reduce the risk of obesity; high in fibre / NSP will reduce the risk of developing bowel-related diseases; high in fibre / NSP controls blood sugar levels which will help to prevent diabetes; fruit contains vitamin A for mucous membranes / visual purple / prevents night blindness / antioxidant; fruit contains vitamin C for prevention of scurvy / healthy skin / absorption of iron / antioxidant; fruit has antioxidant properties which reduces risk of CHD / cancers; low in sodium so prevents high blood pressure; source of water so prevents dehydration / maintains body fluids / eliminates waste / 70 per cent of body is water;</p>	5
8(b)(i)	<p><i>explain how making jam helps to prevent fruit spoiling: boiling fruit</i></p> <p>will destroy enzymes which stop further ripening / will destroy microorganisms / bacteria / yeast / mould;</p>	1

Question	Answer	Marks
8(b)(ii)	<p><i>explain how making jam helps to prevent fruit spoiling: adding sugar</i></p> <p>reduces bacterial growth;</p>	1
8(b)(iii)	<p><i>explain how making jam helps to prevent fruit spoiling: sealing jar</i></p> <p>prevents microorganisms reaching / entering the jam;</p>	1
8(c)	<p><i>ways in which fruit can be included in family meals</i></p> <p>sprinkling dried or fresh fruit on breakfast cereal; as a drink / juice / smoothie – orange juice, banana smoothie; in ice cream – strawberry, lemon sorbet; (cold) dessert – lemon meringue pie, fruit fool, fruit salad, cakes, gateau; used to make soup – apple and pear / celery and apple / strawberry gazpacho; add to salads – coleslaw / Waldorf; cakes / scones / biscuits – fruit / apple / raisins / cherries / pineapple-upside-down; accompaniment – apple sauce with pork / pineapple with ham; useful for picnic / packed meals – grapes / apple sticks; decoration – lemon wedges / glacé cherries; filling for cakes – Swiss roll / Victoria sandwich / jam or fresh fruit; sandwiches – jam sandwiches;</p>	5
8(d)	<p><i>points to consider when choosing fresh apples in a market</i></p> <p>no obvious signs of damage / cuts; check for mould; no bruising; no unpleasant smell; firm / not soft and spongy; clean / reliable source;</p>	3

Question	Answer	Marks
8(e)(i)	<p><i>advantages of using dried fruit</i></p> <p>easy to store / no specialist storage; useful for baking; can be eaten as a snack; lightweight; easy to transport; long shelf life; no preparation / quick to use; available all year round; provides a wider variety to diet; concentrated flavour / more flavour;</p>	3
8(e)(ii)	<p><i>disadvantages of using frozen fruit</i></p> <p>needs to be transported from store to freezer quickly; need to have a freezer; limited choice; may be vitamin loss; may be loss of flavour; may be loss of texture / soggy when defrosted; needs to be defrosted; may be more expensive;</p>	3

Question	Answer	Marks
8(f)	<p><i>describe one method of preparing and freezing strawberries</i></p> <p><i>method one</i> choose undamaged fruit / in best condition; remove inedible parts / stalk / hull; wash and pat dry to prevent sticking together; spread fruit onto open trays to freeze separately / easier to thaw and use later; freeze quickly as small ice crystals prevent damage to cell; when frozen pack into containers according to amount used at one time; use airtight containers / freezer bag to prevent 'freezer burn'; remove air; seal; label with name / date / quantity to identify / use when quality still good;</p> <p><i>method two</i> choose undamaged fruit / in best condition; remove inedible parts / stalk / hull; wash; cook for easier storage / less bulky / saves cooking time later; cool quickly; pack in airtight containers / freezer bag to prevent 'freezer burn'; remove air; seal; label with name, date, quantity to identify / use when quality still good;</p>	5

Question	Answer	Marks
9(a)	<p><i>steps for making shortcrust pastry</i></p> <p>sieve flour and salt; cut butter and vegetable fat into small pieces; rub fats into flour with fingertips until like breadcrumbs; add water a teaspoon at a time to make a soft not sticky dough;</p>	4

Question	Answer	Marks
9(b)	<p><i>reason why pastry should be left in the fridge after making</i></p> <p>relax / rest in the fridge as cold air rises better than warm air / prevents melting of fat / relaxes gluten / cools or hardens fat;</p>	1
9(c)	<p><i>herbs to vary the flavour of the pastry</i></p> <p>bay; chives; coriander; mint; oregano; parsley; rosemary; sage; tarragon; thyme;</p>	2
9(d)	<p><i>rules to follow when rolling pastry</i></p> <p>do not turn pastry over; roll in one direction; turn pastry round for even rolling; do not over-handle / do not touch pastry with palms; use short, forward strokes; avoid pressing down on pastry; do not stretch pastry; lift pastry on rolling pin to turn; do not roll too many times; roll to an even thickness; do not use too much flour for dredging;</p>	4
9(e)(i)	<p><i>suitable root vegetable to add to the pie filling</i></p> <p>carrot / beetroot / swede / turnip / celeriac / salsify;</p>	1

Question	Answer	Marks										
9(e)(ii)	<i>suitable bulb vegetable to add to the pie filling</i> white, brown, red onion / spring onion / shallot / leek / garlic / fennel;	1										
9(f)	<i>ingredient in the chicken pie which causes dextrinisation</i> (plain) flour;	1										
9(g)	<i>changes which would make the pie suitable for a vegan</i> <table border="1" data-bbox="347 549 1503 879"> <tbody> <tr> <td data-bbox="347 549 654 616">change</td> <td data-bbox="654 549 1503 616">replacement</td> </tr> <tr> <td data-bbox="347 616 654 683">butter</td> <td data-bbox="654 616 1503 683">vegetable margarine</td> </tr> <tr> <td data-bbox="347 683 654 750">chicken;</td> <td data-bbox="654 683 1503 750">named nut / named beans / lentil / TVP / tofu / <u>vegan</u> Quorn;</td> </tr> <tr> <td data-bbox="347 750 654 817">milk in white sauce;</td> <td data-bbox="654 750 1503 817">soy / oat / almond / hemp / coconut / rice / quinoa / flax milk;</td> </tr> <tr> <td data-bbox="347 817 654 879">white sauce;</td> <td data-bbox="654 817 1503 879">tomato / vegetable sauce;</td> </tr> </tbody> </table>	change	replacement	butter	vegetable margarine	chicken;	named nut / named beans / lentil / TVP / tofu / <u>vegan</u> Quorn;	milk in white sauce;	soy / oat / almond / hemp / coconut / rice / quinoa / flax milk;	white sauce;	tomato / vegetable sauce;	4
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Question	Answer	Marks
10(a)	<p><i>Discuss ways to be economical when shopping for food and cooking family meals.</i></p> <p><i>shopping [max 8 marks]</i> buy foods in season / use garden produce / pick your own at local farms / markets; buy in bulk as long as the product does not have a short shelf life; buy store's own brand which may be cheaper than branded products; check best before date so less waste; compare / research online prices in different shops / shop at cheaper or discount shops; make use of special offers in shops save 'money off' coupons; make your own dishes rather than buying pre-prepared; plan the meals you are going to eat before shopping / make a shopping list / budget and stick to it; shop locally to avoid use of fuel getting to shops; tinned and frozen fruit and vegetables can be cheaper than fresh; use cheaper cuts of meat or fish / tenderise before cooking; use cheaper sources of HBV protein – milk / cheese / eggs / soya products; use convenience / processed foods with care may be more expensive than fresh;</p> <p><i>cooking [max 8 marks]</i> batch bake / cook in bulk can use some and freeze some; boil two things together such as potatoes and carrots; cook food when needed so no need to reheat; cook just enough to avoid wasting food / do not cook more than is necessary for the meal; cook the whole meal in the oven or on hob; cut food into smaller pieces as it cooks quicker; do not overcook food; don't cook separate meals for individuals in the family; have flat-based pans to have good contact between hotplate and pan; keep lid on pan to retain heat and cook faster so using less fuel; minimise preheating time of oven; reduce size of flame wastes fuel if flames reach up sides of pans; size of pan should fit hot plate to avoid wasting fuel around base of pan; turn off heat before cooking finished to use residual heat / save fuel energy; ensure all appliances are switched off as soon as finished cooking; use a slow cooker / pressure cooker for cooking cheaper cuts of meat; use convenience foods which is pre-prepared / takes little cooking time / may be cheaper than cooking whole meal from scratch;</p>	15

Question	Answer	Marks
10(a)	use divided saucepans; use materials which are good conductors of heat for pans, e.g. cast iron / copper; use only the amount of water needed in kettle / pan so using less fuel; use quick methods of cooking such as microwave / pressure cooking / frying / grilling to save fuel; use leftovers to avoid waste of food;	
10(b)	<p><i>Many processed foods use additives. Explain the benefits of each of the following additives:</i></p> <p><i>(i) emulsifiers;</i> <i>(ii) flavourings;</i> <i>(iii) preservatives.</i></p> <p><i>emulsifiers [max 5 marks]</i> emulsifiers are molecules with a (hydrophilic) head which dissolves in water and a (hydrophobic) tail which dissolves in oil; help mix ingredients together which would normally separate; mix together ingredients like oil and water that would normally separate / maintain an emulsion; allow fats and oils to mix with water to make low-fat spreads / salad dressings / mayonnaise which is good for people on a weight reducing diet as it gives increased choice; help to improve the consistency of products / give food a smooth and creamy texture / mouth feel; improves the appearance (of low fat spreads / salad dressings / mayonnaise) for consumers; help to improve the shelf-life of baked products so there will be less wastage / products can be stored for a longer period of time; form an emulsion when fat and sugar are mixed together; added to bread dough to enhance volume / reduce staling / extend shelf life; added to chocolate to stop fats separating forming fat crystals called blooming; added to frozen dessert products, e.g. ice cream / mousse / sorbet, for a smooth texture and ensure the product does not melt rapidly after serving; lecithin (found in eggs / soya beans / mustard) is a natural emulsifier which may appeal to consumers who wish to avoid artificial ingredients;</p>	15

Question	Answer	Marks
10(b)	<p><i>flavourings [max 5 marks]</i> bring out the flavour in foods without adding a flavour of their own; replaces flavours lost in processing; makes food taste better / gives a stronger flavour / more intense flavour; enhances the smell / give more intense aroma; used to improve / enhance taste by adding / restoring original flavour; to develop a product range e.g. crisps / water; to create new food products with unusual flavours; to reduce sugar content; flavour a product without adding excessive calories which is beneficial as it allows consumers the taste of food without the extra calories of sugar;</p> <p><i>preservatives [max 5 marks]</i> prevent growth of microorganisms / food spoilage / increases time food is safe to eat; prevent fatty food going rancid; prevent oxidation / stops browning; to extend the shelf life of food / to help food keep longer; less waste food / fewer shopping trips so consumer will save time or money; improve keeping quality / maintain freshness; use food out of season; food can be transported greater distances; good for emergencies / unforeseen circumstances; increases variety / range of processed or pre-prepared foods available / more choice for consumer;</p>	