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**FOOD AND NUTRITION**

**0648/13**

Paper 1 Theory

**May/June 2019**

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.

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

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This document consists of **15** 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 undernutrition</i> <u>not enough food</u> / insufficient amount of nutrients	<b>1</b>
1(b)	<i>disease which is caused by protein-energy undernutrition</i> marasmus / kwashiorkor	<b>1</b>

Question	Answer	Marks
2(a)(i)	<i>protein contains the elements</i> nitrogen; sulfur	<b>2</b>
2(a)(ii)i	<i>molecules proteins are made of</i> <u>amino acid</u>	<b>1</b>
2(a)(iii)i	<i>enzymes which break down protein</i> erepsin; pepsin; trypsin / trypsinogen	<b>2</b>
2(a)(iv)	<i>absorption of protein takes place in the</i> <u>ileum</u>	<b>1</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(b)(i)	<i>explain term of protein complementation</i> mixture of LBV and LBV protein (in same meal)	<b>1</b>
2(b)(ii)	<i>benefit of protein complementation</i> essential / IAA lacking in one food can be compensated by the other food / improves supply of essential amino acids / IAA	<b>1</b>
2(b)(iii)	<i>examples of protein complementation</i> beans on toast; lentil soup and bread roll; peanut butter sandwich; rice and peas; hummus and pitta; chocolate mousse with gelatine	<b>4</b>

Question	Answer	Marks
3(a)	<p><i>composition of polysaccharides</i></p> <p>made from chains of monosaccharides / glucose molecules</p>	<b>1</b>
3(b)	<p><i>sources of starch</i></p> <p>arrowroot; bananas; bread; breakfast cereals; cassava / tapioca; cereals / one named; flour / one named product (biscuits / cakes / pastries); nuts / one named; pasta; plantain; potatoes; pulses / one named; root vegetables / one named; sago; seeds / one named; yam</p>	<b>4</b>
3(c)	<p><i>effects of moist heat on starch</i></p> <p>starch grains first soften / swell as they absorb water; starch grains burst / rupture when heated releasing starch; <u>gelatinisation</u> occurs when starch granules absorb water / swell which thickens the mixture</p>	<b>3</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
3(d)	<p><i>ways in which NSP is used by the body</i></p> <p>adds bulk as it absorbs water in the colon and swells; softens faeces making it easy to remove; stimulates peristalsis which helps remove waste / faeces; lowers blood cholesterol levels; absorbs toxins; slows down the release of glucose into the bloodstream; increases satiety</p>	<b>4</b>
3(e)	<p><i>health problems caused by an excess of NSP</i></p> <p>flatulence / wind / abdominal gas; IBS; diarrhoea; bloating; inability to absorb nutrients; cramping</p>	<b>4</b>
3(f)	<p><i>digestion of cooked starch in the mouth</i></p> <p>amylase / ptyalin (from salivary glands); converts cooked starch into maltose</p>	<b>2</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
4(a)	<p><i>what is meant by the term water balance</i></p> <p>ratio between the water / fluid taken into the body and that lost from the body</p>	<b>1</b>
4(b)	<p><i>effects of an inadequate intake of water</i></p> <p>constipation;  dehydration;  dizziness / faint;  dry mouth / lips;  dry skin;  fatigue / lethargy;  headache;  thirst;  kidney stones</p>	<b>3</b>
4(c)	<p><i>groups of people who need water with a reason</i></p> <p>lactating mothers – water required for production of milk for baby;  manual workers – water lost in perspiration / to keep cool;  athletes / active people – to keep cool / replace water lost in perspiration;  those who live in hot climates – water evaporated to keep cool;  those who have lost blood in accidents / surgery – fluid volume replaced;  sufferers from diarrhoea / vomiting – water loss must be replaced;  children – active so need to stay hydrated;  pregnant women – foetal circulation / amniotic fluid / blood volume</p>	<b>4</b>



<b>Question</b>	<b>Answer</b>	<b>Marks</b>
5(a)	<i>methods which could be used to make biscuits</i>  rubbing in; creaming / all in one; whisking	<b>2</b>
5(b)	<i>steps to make biscuits using the melting method</i>  sieve dry ingredients (flour, bicarb, ginger) into mixing bowl; put marg, syrup and sugar into saucepan; gently heat saucepan contents until marg melted and sugar dissolved, stirring all the time; pour melted mixture into dry mixture and mix to a fairly stiff dough; divide into 12 equal portions and shape into balls; space evenly on baking tray, flatten slightly	<b>5</b>
5(c)	<i>ingredient in the basic recipe which produces carbon dioxide</i>  <u>bicarbonate of soda</u>	<b>1</b>

Question	Answer	Marks												
6(a)	<p><i>example of types of vegetables</i></p> <table border="1" data-bbox="322 284 1953 676"> <thead> <tr> <th data-bbox="322 284 757 349">type of vegetable</th> <th data-bbox="757 284 1953 349">example</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 349 757 413">root</td> <td data-bbox="757 349 1953 413">carrot / parsnip / turnip / radish</td> </tr> <tr> <td data-bbox="322 413 757 477">tuber</td> <td data-bbox="757 413 1953 477">potato / Jerusalem artichoke / yam</td> </tr> <tr> <td data-bbox="322 477 757 541">fruit</td> <td data-bbox="757 477 1953 541">tomato / cucumber / peppers / corn on the cob / courgette</td> </tr> <tr> <td data-bbox="322 541 757 604">pod</td> <td data-bbox="757 541 1953 604">mange tout / French beans / runner beans / okra</td> </tr> <tr> <td data-bbox="322 604 757 676">bulb</td> <td data-bbox="757 604 1953 676">onion / shallot / leek</td> </tr> </tbody> </table>	type of vegetable	example	root	carrot / parsnip / turnip / radish	tuber	potato / Jerusalem artichoke / yam	fruit	tomato / cucumber / peppers / corn on the cob / courgette	pod	mange tout / French beans / runner beans / okra	bulb	onion / shallot / leek	5
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6(b)(i)	<p><i>disadvantages of fresh veg</i></p> <p>seasonal / not always available;            may be expensive;            short shelf life / have to buy frequently;            preparation may be needed;            waste results from preparation;            may be loss of vitamins if not eaten / used quickly / prepared properly</p>	2												
6(b)(ii)i	<p><i>disadvantages of canned veg</i></p> <p>processing may affect colour;            texture may be different to fresh;            may be water soluble vitamin loss;            may have additives</p>	2												

Question	Answer	Marks
6(c)	<p><i>points to consider when buying fresh vegetables</i></p> <p>no obvious signs of damage;  check for mould / decay;  no bruising;  no unpleasant smell;  not wilted;  good colour;  no excess soil;  firm not soft and spongy;  buy in season as often cheaper;  slightly under ripe to last longer;  origin / local / food miles;  organic</p>	4
6(d)(i)	<p><i>ways to conserve nutritional value when preparing cabbage</i></p> <p>wash before cutting;  tear instead of cutting;  do not shred too thinly;  use a sharp knife;  prepare just before cooking;  do not soak</p>	3
6(d)(ii)	<p><i>ways to conserve nutritional value when cooking cabbage</i></p> <p>cook in a small amount of boiling water;  keep lid on pan;  do not overcook;  use cooking liquid in sauces;  do not add bicarbonate of soda to cooking water;  instead of boiling steam / stir fry / microwave / pressure cook</p>	3

Question	Answer	Marks
7(a)	<p><i>factors for a family to consider before choosing a new freezer</i></p> <p>size in relation to floor space / space available in kitchen;            where freezer is to be positioned, if in utility room / garage it should be appropriate model;            capacity with regard to types of food to be frozen / or number of people in the family;            type of freezer e.g. fridge freezer / chest / upright / integrated / under-counter depends on positioning and space;            money available / only buy what can be budgeted for;            energy efficiency A++ is cheaper to run than G;            colour to co-ordinate with kitchen if upright / under-counter;            manufacturers name / brand for reliability;            features such as frost free model / automatic defrost / high temp warning alarm / door open alarm;            rollers to move easily for cleaning purposes</p>	<b>6</b>
7(b)	<p><i>temperature for a home freezer</i></p> <p>–18 °C to –24 °C</p>	<b>1</b>
7(c)	<p><i>reasons why freezing prevents food spoilage</i></p> <p>bacterial growth is stopped / bacteria become dormant / they need warmth to reproduce;            water is turned to ice so is unavailable to bacteria / they need moisture to reproduce</p>	<b>2</b>
7(d)	<p><i>benefit of blanching peas before freezing</i></p> <p>inactivates enzymes;            prevents discolouration / retains colour;            reduces surface bacteria</p>	<b>1</b>

Question	Answer	Marks
7(e)(i)	<p><i>thaw frozen chicken joints completely before cooking</i></p> <p>so heat is able to penetrate centre of joint and cook thoroughly not just warm to dangerous level</p>	<b>1</b>
7(e)(ii)	<p><i>fast freezing of fresh fish is essential for best quality</i></p> <p>small ice crystal limits cell damage / maintains texture / retains flavour</p>	<b>1</b>
7(e)(iii)	<p><i>food placed in a freezer must be well wrapped</i></p> <p>to prevent freezer burn / prevent food becoming loose in freezer e.g. peas</p>	<b>1</b>
7(e)(iv)	<p><i>do not place hot or warm foods in a freezer</i></p> <p>raises temperature of freezer above acceptable level / may cause food to deteriorate / causes freezer to work less efficiently / more expensive use of fuel</p>	<b>1</b>
7(e)(v)	<p><i>never refreeze defrosted food</i></p> <p>bacteria may have entered food and begun to reproduce which could cause food poisoning</p>	<b>1</b>
7(f)	<p><i>one star *</i> store frozen food for up to one week</p> <p><i>two stars **</i> store frozen food for up to one month</p> <p><i>three stars ***</i> store frozen food up to 3 months</p>	<b>3</b>

Question	Answer	Marks
8(a)	<p><i>Discuss reasons why more people are choosing to follow a vegetarian diet.</i></p> <p>cultural / traditional; e.g. diet of a particular area or country;  religious beliefs; e.g. some Jews / Muslims do not eat pork / some Hindus are vegetarian / do not eat beef;  moral beliefs; e.g. may object / believe it is wrong / cruel to kill / slaughter animals for consumption;  ethical reasons; e.g. animal welfare / rights / cruelty some people disagree with the way animals are reared / intensive animal farming (e.g. battery hens, factory farming);  health / cholesterol; e.g. may contain low amounts of saturated fat so reduces the risk of obesity / high blood cholesterol / hypertension / stroke / heart disease / type 2 diabetes;  health / vitamins; e.g. diet may contains high amounts of fruit / leafy green vegetables which are a good source of ACE / antioxidant vitamins which help ward off free radicals in the body / reduce the risk of certain cancers;  health / NSP; e.g. vegetarian diet may be higher in fibre so helps prevent the risk of constipation / diverticulitis / bowel cancer / haemorrhoids / piles;  protection from disease; e.g. vegetarian diet may protect against certain food-borne illnesses bird ‘flu / BSE / salmonella from eggs / chickens;  food safety; e.g. less risk of health issues caused by the use of hormones used in animal rearing;  green / environmental issues; e.g. better for the environment as less production of methane from cows / e.g. may feel large scale animal farming isn’t sustainable / uneconomical use of land / wasteful of resources;  likes / dislikes; e.g. people may not like the taste / smell / texture / appearance of animal flesh;  economy; e.g. vegetarian diet can be cheaper / more economical as meat is more expensive to buy than plant products / cereals / pulses;  influence from others; e.g. from family / celebrities / peers / media trends to follow vegetarian diet;  land wastage; more crops could be grown if land was used for cereals so more people could be fed from same area of land;  technology; e.g. wider variety / availability of vegetarian products / options in shops / restaurants nowadays</p>	15

Question	Answer	Marks
8(b)	<p><i>Discuss and explain the specific nutritional needs of a manual worker. Explain ways in which a manual worker can be economical with fuel when cooking meals.</i></p> <p><i>nutritional needs [max. 8 marks]</i></p> <p>protein / specifically HBV for building muscle mass / replace worn out cells;  calcium for maintenance of skeleton / bones;  iron for oxygen transport / oxidise glucose / produce energy;  sodium chloride / salt to replace that lost during physical activity;  vitamin B to release energy from carbohydrates / fats / protein;  vitamin C to replace that lost during physical exertion / absorption iron / connective tissue;  vitamin K for blood clotting;  water / fluid to replace that lost during physical exertion / avoid dehydration / 70% body is water;  provide sufficient calories for activity from energy-dense food / starch / fat;  fat for insulation</p> <p><i>economical cooking [max. 8 marks]</i></p> <p>use quick methods of cooking such as microwave / pressure cooking / frying / grilling to save fuel;  use a slow cooker which uses less fuel / cooks whole meal from one heat source;  cook a lot of things at the same time in the oven to make full use of fuel being used;  use steamers to cook a whole meal from one heat source;  cook just enough food to avoid wasting fuel (unless eating remainder cold next day);  cut food into smaller pieces as it cooks quicker;  keep lid on pan to retain heat and cook faster so using less fuel;  use only the amount of water needed in kettle / pan so using less fuel;  do not overcook food so as not to waste fuel;  cook food when needed so no need to reheat;  size of pan should fit hot plate to avoid wasting fuel around base of pan;  gas flames should not come around base of pan as heat is wasted;  cook the whole meal in the oven or on hob;  minimise preheating time of oven;  turn off heat before cooking finished to use residual heat;  use divided saucepans so only one burner is used</p>	15