

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

## **MARK SCHEME for the October/November 2015 series**

### **0648 FOOD AND NUTRITION**

**0648/12**

Paper 1 (Theory), maximum raw mark 100

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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**Mark schemes will use these abbreviations**

- ; separates points worth 1 mark
- – separates points worth less than 1 mark
- / alternatives
- **R** reject
- **A** accept (for answers correctly cued by the question)
- **I** ignore as irrelevant
- **ecf** error carried forward
- **AW** alternative wording (where responses vary more than usual)
- **AVP** alternative valid point
- **ORA** or reverse argument
- underline actual word given must be used by candidate
- ( ) the word / phrase in brackets is not required but sets the context
- max indicates the maximum number of marks
- *italics* used to denote words or phrases from the question

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Question	Answer	Mark	Guidance for Examiners
1 (a)	hydrogen – oxygen;	[1]	
(b) (i)	<i>monosaccharides</i> simplest form of carbohydrate / simple sugars / base unit from which carbohydrates are made / product of digestion of carbohydrate;  <i>examples</i> glucose – fructose – galactose;	[2]	
(ii)	<i>polysaccharide</i> made from more than two / many monosaccharides / sugars;  <i>examples</i> starch – pectin – dextrin – glycogen – cellulose;	[2]	
(c) (i)	<i>invertase</i> – <u>sucrose</u> (to glucose and) <u>fructose</u> ;	[1]	
(ii)	<i>digestion of carbohydrates</i> <i>lactase</i> – <u>lactose</u> (to glucose and) <u>galactose</u> ;	[1]	
(d)	mechanical / physical energy / exercise – movement – work – chemical energy – metabolism or making hormones / enzymes / antibodies / blood – growth – repair – mental / brain function – digestion / eating – absorption – excretion – fight infection – heat energy – maintain body temperature – electrical energy – transmit nervous impulses – basal metabolism / sleeping – heartbeat – blood circulation – breathing –	[3]	
(e) (i)	sugar – chocolate – honey – energy drinks;	[1]	
(ii)	(wholegrain) pasta – rice – (wholegrain) cereals / named example – couscous – noodles – oats – potatoes – lentils – breakfast cereals – unripe bananas;	[1]	
(f)	<u>excess</u> energy stored as fat; leads to overweight / obesity; diabetes; CHD / heart disease / stroke; hypertension; damage to joints / arthritis; risk of complications during surgery / pregnancy; varicose veins; hernia; loss of confidence;  <u>insufficient</u> energy leads to weight loss; becoming underweight; tired; headaches; muscle waste; use up fat stores; loss of confidence; anorexia nervosa; problems producing milk when lactating; slows down recovery during / after illness;	[4]	

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Question	Answer	Mark	Guidance for Examiners
(g)	rate at which the body uses energy when completely at rest/to stay alive/to keep the body functioning;	[1]	
2 (a)	promotes absorption of calcium/phosphorus; formation of bones/teeth; maintenance of bones/teeth; prevents rickets in children; prevents osteomalacia in adults; osteoporosis; growth;	[2]	
(b)	oily fish/one named example – fish liver oil/one named example – milk – cheese – margarine – eggs – butter – liver – <u>fortified</u> breakfast cereal –	[2]	
(c) (i)	<u>rickets</u>	[1]	
(ii)	bone pain – bone fracture – soft/weak bones – weak teeth – poor growth – bowed legs/knock knees – curvature of the spine – thickening of ankles/wrists/knees – skull becomes fragile – pigeon chest –	[1]	
(iii)	<u>calcium</u> and <u>phosphorus</u> ;	[1]	
(d)	people who are house-bound – not outdoors so not exposed to sunlight;  those who cover their body for religious reasons – although outdoors, sun cannot reach skin;  people who live in industrial/polluted areas – sunlight prevented from reaching them by smoky atmosphere;  people suffering from polymorphic light eruption/ photosensitivity – allergic to sunlight;	[4]	
3 (a) (i)	<u>dehydration</u>	[1]	
(ii)	yellow/dark urine – high temperature – increased heart beat – headache – lethargy/weakness/lack of energy/fatigue/tired – thirst – constipation – dry mouth – dizziness – faint – dry/loose skin – nausea/vomiting – confusion –	[1]	

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>	<b>Guidance for Examiners</b>
<b>(b)</b>	<p>people who are ill – fluid needs to be replaced due to raised temperature / sweating;</p> <p>lactating mothers – water required for production of milk for baby;</p> <p>manual workers – water lost in perspiration / to keep cool;</p> <p>athletes / active people – to keep cool / replace water lost in perspiration;</p> <p>those who live in hot climates – water evaporated from body to keep cool;</p> <p>those who have lost blood in accidents / surgery – fluid volume replaced;</p> <p>sufferers from diarrhoea / vomiting – water loss must be replaced;</p> <p>sufferers from constipation – process impacted faeces / allow faecal transit;</p>	[2]	
<b>(c)</b>	<p>fruit / named example – vegetable / named example – tomatoes – cucumber – lettuce – spinach – rocket – watermelon – soup – fruit – vegetables – milk – juice / soft drinks –</p>	[2]	

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Question	Answer	Mark	Guidance for Examiners
4	<p>provide protein foods – to repair worn out cells;</p> <p>provide iron – to prevent anaemia;</p> <p>include vitamin C – to absorb iron – immunity;</p> <p>provide calcium/phosphorus – to maintain bones and teeth – prevent osteoporosis – for blood clotting – muscle function;</p> <p>include vitamin D – to absorb calcium;</p> <p>fewer carbohydrate foods – elderly may be less active;</p> <p>low in saturated fat – reduces risk of CHD/stroke/obesity;</p> <p>reduce salt – reduces risk of hypertension/high blood pressure;</p> <p>reduce sugar – reduces risk of tooth decay – obesity – higher sugar intake is linked to diabetes;</p> <p>increase fruit and vegetables – NSP – less risk of constipation;</p> <p>small portions – appetite reduces with age;</p> <p>remove bones/skin – eyesight may be poorer;</p> <p>food needs to be easy to eat/chew – cut into small pieces/mince – elderly may have few teeth/dentures;</p> <p>soft foods – easier to eat/swallow;</p> <p>variety of colour – flavour – texture – to add interest – make appetising;</p> <p>reduce spices and strong flavours – these are less easily tolerated;</p>	[6]	

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Question	Answer	Mark	Guidance for Examiners
5 (a)	A <i>salad vegetables</i> in salad drawer B <i>bananas</i> not kept in fridge C <i>raw minced beef</i> lowest shelf / above crisper D <i>milk</i> in door compartment E <i>trifle</i> top shelf F <i>cooked chicken</i> shelf above minced beef	[5]	
(b)	do not overload; do not open door too often / leave door open; do not store raw food above cooked food; do not place hot food in the refrigerator; do not keep out of date food; keep food covered; rotate stock; keep food in correct place in the refrigerator; defrost regularly; clean inside regularly / clean up spills; check refrigerator is working properly; check temperature is 0–5 °C; do not keep out of date food / throw away rotten or mouldy food;	[5]	
(c)	<u>mould</u> ; <u>yeast</u> ;	[2]	
(d)	warmth – moisture – food – time – oxygen / lack of oxygen – correct pH –	[2]	
6 (a)	flour, butter, milk;	[1]	
(b)	moist heat on starch; grains soften; grains swell as liquid absorbed; (80 °C) some grains rupture; releasing starch (granules); liquid thickens;	[4]	
(c) (i)	milk added too quickly / too much milk added at a time; milk added on heat; not stirred well between each addition of milk; not stirred during boiling;	[2]	
(ii)	inaccurate weighing / proportions of ingredients; too much liquid; not enough flour; undercooked / not heated to correct temperature for long enough; starch has not gelatinised;	[2]	

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<b>Question</b>	<b>Answer</b>	<b>Mark</b>	<b>Guidance for Examiners</b>
<b>(d)</b>	<p>add moisture – gravy with roast meat/ custard with apple pie;</p> <p>add nutrients – milk or egg in custard/ chocolate sauce/ cheese sauce;</p> <p>add colour – tomato sauce with pasta/ jam sauce with sponge pudding;</p> <p>add flavour – cheese sauce with cauliflower/ mint sauce with lamb;</p> <p>counteract richness – apple sauce with roast pork/ orange sauce with duck;</p> <p>add interest/ variety – chocolate sauce with ice cream;</p> <p>add contrasting texture – bread sauce with roast poultry/ parsley sauce with fried fish;</p> <p>binds food together – rissoles;</p>	[4]	
<b>(e) (i)</b>	<p>use unsalted/ reduced salt butter;</p> <p>use reduced/ low salt ham;</p> <p>replace ham with alternative ingredient;</p> <p>use reduced/ low salt cheese;</p> <p>omit salt and replace with low salt/ herbs;</p> <p>do not fry mushrooms in butter;</p>	[2]	
<b>(ii)</b>	<p>change ham to lean ham/ remove fat;</p> <p>omit butter/ use low fat margarine/ butter/ spread/ make a blended sauce;</p> <p>use skimmed/ semi-skimmed milk;</p> <p>use reduced fat cheese;</p> <p>no skin/ fat on chicken;</p> <p>do not fry mushrooms;</p> <p>do not use fat in the mashed potato;</p>	[2]	
<b>(iii)</b>	<p>remove chicken/ ham;</p> <p>replace with a protein alternative egg/ soya/ tofu/ TVP/ pulses;</p>	[2]	



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Question	Answer	Mark	Guidance for Examiners
(f)	name of the product – description – list of ingredients – weight/ volume – name of manufacturer – contact details of manufacturer – place of origin – storage instructions – cooking instructions – use-by/ best-before date – special claims/ nutritional information/ low fat/ high fibre – nutritional information per 100g product – bar code – picture of the food – serving size/ portion – serving suggestion – allergy information – vegetarian logo – coeliac symbol – halal symbol – Möbius loop/ recycling symbol – litter man symbol –	[3]	
7 (a)	butter beans – haricot beans/ baked beans – mung beans – adzuki beans – borlotti beans – split peas – red/ green/ yellow/ brown lentils/ dhal – soya beans – cannellini beans – chick peas/ chana – flageolet beans – black-eyed beans/ peas – garden peas – runner beans – broad beans – peanuts/ ground nuts – pinto beans – pigeon pea – lima beans – yard bean/ long bean/ snake bean/ cow pea/ asparagus pea/ pea bean/ garter bean/ Chinese long bean –	[3]	
(b)	source of LBV protein; valuable in vegan diet to give HBV/ soya HBV; low fat; source of iron; provide carbohydrate/ starch so are filling; provide NSP; source of B <sub>1</sub> / B <sub>3</sub> ; source of calcium;  vegan may lack (HBV) protein in the diet; easy/ cheap to produce; dry so easily stored; give variety to meals; add texture/ flavour; useful as meat replacement/ extender;	[3]	

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Question	Answer	Mark	Guidance for Examiners
(c)	<p><u>soak</u> for up to 12 hours to take up water lost during drying/to allow them to soften or swell or cook more quickly;</p> <p>drain and rinse the beans, then cover them with fresh water;</p> <p><u>boil</u> for 15 minutes which destroys toxins/lectin in kidney beans to prevent food poisoning;</p> <p>simmer for around 45–60 minutes to make them tender;</p> <p>do not add salt until the end of cooking as it toughens the skin and stops the inside from becoming tender;</p>	[3]	

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Question	Answer	Mark
8 (a)	<p><i>reasons for preserving food</i>  to provide food when supply is limited famine / war;  to enjoy food out of season;  to save money by buying food when it is cheap and plentiful;  to give variety / new products made like jam or pickles;  to cope with a glut;  to prevent waste;  to extend shelf life / prevent food spoilage / growth of mould;  to allow food to be transported;  to enjoy produce from other countries;  to store when quality is best and cost is lowest;  to retain as many of the qualities of fresh food as possible, e.g. flavour / colour / appearance / texture / nutritive value;</p> <p><i>methods of freezing vegetables</i>  select best quality;  prepare according to type / wash / peel / cut;  blanch to destroy enzymes / bacteria;  cool rapidly;  open freeze as easier to thaw and use later;  set freezer at 'fast freeze' 2–3 hours to prevent formation of large ice crystals which damage cell walls;  cover / seal / wrap to prevent air entry / evaporation of moisture;  air should be removed from package to prevent 'freezer burn';  label with name and date to identify;</p> <p><i>methods of making fruit jam</i>  use ripe or just underripe fruit with more pectin;  prepare fruit by removing inedible parts / stones, cutting them up, and washing them;  boil / stew fruit to soften and release pectin;  wash and warm jars in the oven;  add sugar when skins are soft;  stir until sugar is dissolved to prevent burning on bottom of pan;  boil rapidly to reach setting point;  test for setting point / wrinkle test / flake test / correct temperature / 220 °C;  fill warmed jars to the top so less room for air as jam contracts when cooling;  seal;  label with name and date so can be used in rotation / to identify;</p> <p><i>freezing principles</i>  bacteria need warmth and moisture to multiply;  water in cells frozen so unavailable for growth of bacteria;  bacteria inactive / dormant at low temperatures / –18 °C;  enzyme activity is slowed down at low temperature;</p> <p><i>fruit jam making principles</i>  heat during process destroys microorganisms;  high sugar content (60%) inhibits growth of microorganisms;  sealed in jars to prevent entry of microorganisms;</p>	<p>[15]</p> <p>For full marks, candidates should:</p> <ul style="list-style-type: none"> <li>demonstrate a detailed, sound and balanced understanding of the topic;</li> <li>refer to relevant examples;</li> <li>use correct terminology;</li> <li>provide comments which are precise and relevant;</li> <li>answer in a well-organised and clearly presented way.</li> </ul>

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(b)	<p>create a budget / have a fixed amount of money to spend / use cash;  use basket rather than trolley to prevent buying more than needed;  choose food that the family like and will eat;  plan meals to minimise wastage of food and money;  make a shopping list / only come out with what you went in for;  buy foods in season;  use local farms / markets / pick your own foods;  do not shop when hungry as this can lead to impulse buys;  buy foods with a long best before date to give longer time to use / less waste;  use website to compare supermarket prices / shop around;  choose cheaper cuts of meat / fish;  look for special offers in shops / BOGOF / save 'money off' coupons;  buy supermarket own brand label;  buying in bulk can be cheaper if suitable storage available;  avoid processed / convenience food as it can be expensive;  only buy enough for your needs;  use LBV protein foods;  use cheaper sources of HBV protein;  buy food reduced at the end of the day;  use more pasta / rice as it is cheap and filling;  tinned and frozen fruit and vegetables can be cheaper than fresh;  vegetables / beans / soya can be used to extend meat;  exchange ingredients such meat / for vegetables in a recipe;  make your own sauce / paste / houmous as it may be cheaper than from the shop;  compare prices per 100 g / unit to get best value;  use leftover food as next day meals;  avoid waste by peeling fruit and vegetables thinly;  buy food in good condition, e.g. not bruised fruit, so that it lasts;</p> <p>use quick methods of cooking such as microwave / pressure cooking / frying / grilling to save fuel;  use a slow cooker for cooking cheaper cuts of meat;  use tiered steamers to cook a whole meal;  cook just enough to avoid wasting food;  batch bake / cook in bulk so that some can be used immediately and some frozen;  cut food into smaller pieces as it cooks quicker;  keep lid on pan to retain heat and cook faster, so use less fuel;  use only the amount of water needed in kettle / pan so use less fuel;  do not overcook food;  cook food when needed so no need to reheat;  use materials which are good conductors of heat for pans, e.g. cast iron, copper;  have flat-based pans to have good contact between hotplate and pan;  size of pan should fit hotplate to avoid wasting fuel around base of pan;  reduce size of flame because it wastes fuel if flames reach up the sides of the pan;  cook the whole meal in the oven or on the hob;  minimise preheating time of oven;  turn off heat before cooking has finished to use residual heat;</p>	<p>[15]</p> <p>For full marks, candidates should:</p> <ul style="list-style-type: none"> <li>• demonstrate a detailed, sound and balanced understanding of the topic;</li> <li>• refer to relevant examples;</li> <li>• use correct terminology;</li> <li>• provide comments which are precise and relevant;</li> <li>• answer in a well-organised and clearly presented way.</li> </ul>
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	do not cook separate meals for individuals in the family; use divided saucepans; boil two things together, e.g. peas and carrots;	
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