



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

FOOD AND NUTRITION

0648/01

Paper 1 Theory

May/June 2016

MARK SCHEME

Maximum Mark: 100

Published

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Page 2	Mark Scheme	Syllabus	Paper
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Question	Answer	Marks
1 (a)	how the body uses energy/ chemical processes or (chemical) reactions occurring in the body;	[1]
(b)	(mechanical energy for) muscle movement/ voluntary work/ involuntary work/ exercise; (chemical energy for) metabolism/chemical reactions/growth and repair/digestion/absorption/excretion; (heat energy to) maintain body temperature; (electrical energy for) transmission of nervous impulses; (basal metabolism for) heartbeat/blood circulation/breathing/brain activity;	[3]
(c)	warmth/heat/insulation; energy <u>store</u> /protein sparing; protection of internal organs; solvent for fat-soluble vitamins/vitamins A and D; formation of cell membranes; increases calorific value of food without adding bulk; high satiety value/gives a feeling of fullness after a meal; provides <u>essential</u> fatty acids;	[4]
(d)	obesity; heart conditions/heart attack/CHD/CVD; mental illness/low self-esteem; high blood pressure/hypertension; strokes; high cholesterol/blocked arteries; diabetes; dental caries/tooth decay;	[4]
(e) (i)	meat – fish – cheese – eggs – milk – soya –	[2]
(ii)	pulses – beans – peas – cereals/(whole)grains – cereal products – nuts – gelatine – seeds –	[2]
2 (a)	starch is changed to <u>maltose</u> ; by salivary <u>amylase</u> ;	[2]
(b)	<u>duodenum</u> ;	[1]
(c)	<u>bile</u> ;	[1]
(d)	erepsin/pepsin/trypsin/trypsinogen;	[1]
(e)	<u>amino acids</u> ;	[1]

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Question	Answer	Marks
3	wholegrain / wholemeal cereals; cereal products / bread / flour; fortified breakfast cereal; wheat germ; red meat; liver; kidney; heart; eggs; fish roe; milk / dairy products; seeds / nuts / beans / peas / pulses; potatoes; asparagus / kale; cauliflower; oranges; <u>beri beri</u> ; <u>riboflavin</u> ; <u>sunlight</u> ; dementia / dermatitis / diarrhoea;	[2] [1] [1] [1]
4 (a)	production of visual purple in retina of eye; helps vision in dim light / at night; prevents night blindness; formation of mucous membranes; required to keep mucous membranes, e.g. throat / digestive / bronchial / excretory tracts, moist and free from infection; for healthy skin; antioxidant; required for growth;	[3]
(b) (i)	milk – cheese – butter – liver – kidney – eggs – fish liver oil – oily fish –	[2]
(ii)	<u>(beta-)carotene</u> ;	[1]
5	protein; (rapid) growth / production of hormones / repair; calcium / phosphorus; bones / teeth; vitamin D; absorption of <u>calcium</u> ; iron; carries oxygen for respiration / blood loss during menstruation / anaemia; vitamin C; absorption of iron;	[6]
6 (a)	oats – barley – rye – corn / maize / mealie-meal – millet – rice – sorghum – quinoa –	[2]
(b)	readily available; easy to transport; easy to store; easy to grow; cheap; source of energy; slow-release carbohydrate / complex carbohydrate; filling; source of (LBV) protein / idea of protein complementation; NSP (in wholegrains) / good for digestive system / help prevent constipation; versatile / variety / can be used for sweet and savoury dishes;	[4]

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Question	Answer	Marks
7 (a)	use wholemeal flour; use wheatmeal flour; use granary flour; add oats; add bran; add nuts/seeds; add dried fruit/named example; add (fresh) fruit/named example; add vegetable/named vegetable;	[4]
(b)	<u>high</u> / <u>more</u> gluten content; gives a strong elastic dough/helps trap carbon dioxide; gives a better structure/firmer structure/firmer shape;	[1]
(c)	sensitivity/intolerance to the protein <u>gluten</u> / <u>wheat</u> ;	[1]
(d)	(too) hot – destroys/kills the yeast; warm – activates the yeast; (too) cold – slows the activity of the yeast;	[1]
(e)	strengthen gluten/add flavour/add taste;	[1]
(f)	carbon dioxide produced; warmth encourages fermentation; carbon dioxide expands/makes the bread rise; liquid changes to steam; gluten stretches and coagulates; heat kills the yeast; alcohol evaporates; starch gelatinises due to moist heat on starch; crust forms on the outside due to dry heat on starch; outside crust browns due to dextrinisation (of starch); caramelisation (of sugar); Maillard browning;	[5]
(g)	warmth; sugar; oxygen/lack of oxygen; suitable pH;	[2]
8 (a)	sauté; dry; shallow; deep; stir;	[3]
(b)	quick method of cooking/convenient; food becomes brown; crisp surface/nice texture; flavour developed; colour developed; appetising smell; little loss of nutrients;	[3]

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Question	Answer	Marks
(c)	<p>pan for deep frying is not more than half full of oil so fat does not overflow when the food is added;</p> <p>lower food gently into the fat to avoid splashing fat;</p> <p>do not overfill the pan with food due to the danger of overflowing;</p> <p>make sure the inside of the food is properly cooked / danger of food poisoning if the inside is not thoroughly cooked;</p> <p>make sure the pan / equipment / food is dry because water turns to steam and can splutter (causing burns);</p> <p>put pan on the back burner as there is less chance of it being knocked over;</p> <p>pan handle turned in in case it is knocked over;</p> <p>flat base on frying pan so it sits securely on the burner;</p> <p>do not leave unattended as it may ignite;</p> <p>monitor temperature as the oil can ignite;</p> <p>turn heat off if fat begins to smoke as fat is near flash point;</p> <p>have a lid / damp tea towel / fire blanket nearby to extinguish flames;</p> <p>do not move pan until fat is cold because it may still catch fire;</p> <p>leave pan to cool before handling / washing up the pan;</p> <p>no water nearby because water will make the fat spit;</p>	[5]
(d)	<p>immerse the affected area in cold water for at least 10 min / put affected area in running water for at least 10 min;</p> <p>remove jewellery near the burnt area of skin but do not remove anything that is stuck to the burnt skin;</p> <p>cover affected area with a clean, non-fluffy cloth / cling film;</p>	[2]
9 (a)	<p>size of family;</p> <p>requirements of oven, e.g. defrosting / reheating / cooking fresh ingredients;</p> <p>space available in the kitchen / size of microwave;</p> <p>type required, e.g. combination oven and microwave;</p> <p>digital or manual controls;</p> <p>not too complex to work;</p> <p>reliable brand;</p> <p>design and style / colour;</p> <p>power output / heating category A–E / energy efficiency;</p> <p>cost;</p>	[4]
(b)	<p>not all foods can be cooked, e.g. pastry / whole eggs;</p> <p>food does not brown;</p> <p>food does not become crisp;</p> <p>flavours do not develop because food cooks quickly;</p> <p>not suitable for large pieces of food / joints of meat / rays only penetrate 4 cm;</p> <p>no metal dishes / metal decorations because this causes arcing (which can damage the magnetron);</p> <p>easy to overcook due to speed of cooking;</p> <p>standing time required to allow cooking to continue, so overcooking can occur;</p> <p>different thickness of food cook unevenly / food needs to be turned / moved round frequently;</p> <p>liquids need to be stirred to allow even cooking / avoid 'hot spots';</p> <p>size of the oven cavity limits the quantity and size of the food which can be cooked;</p>	[4]

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(c)	<p>magnetron generates electromagnetic waves / microwaves / radiation; penetrate food to depth of 4 cm; molecules in food absorb electromagnetic waves / microwaves / radiation; molecules in food agitated; agitation produces thermal heat energy; heated molecules transfer heat to neighbouring molecules by conduction;</p>	[3]
10 (a)	<p><i>packaging [max 8]</i> protects food from damage during transport / storage; to provide information to consumer, e.g. nutrition; looks attractive / appealing; saves time in shops – foods do not need to be wrapped – easy to carry; prevents tampering; to prevent contamination from dust / flies / pests / microorganisms; makes storage easier – rigid shapes can be stacked; items contain a specific weight / portion size / can be sold at a set price; can be used during the reheating of food; to protect from damage, e.g. eggs in cartons; to extend the life of a product by canning; to extend the life of a product by removing oxygen in vacuum packaging; to extend the life of a product by removing light in foil packaging; to extend the life of a product by using an atmosphere of nitrogen in MAP;</p> <p><i>labelling [max 8]</i> give information to the consumer – some information is a legal requirement; name of product – so correct type of food can be bought; picture of product – see contents at a glance; product description – know what is being bought, e.g. specific cut of meat / tuna in brine; brand name – may want to buy from a well-known range / reliability; name and address / phone number / email of manufacturer – in case of complaint / need to contact; price – so customers can compare / get value for money; recycling symbol – correct disposal of packaging; country of origin ability – select / boycott products / carbon footprint / political reasons; list of other products in range – to encourage customer to buy more; ingredient list / in descending order / by weight – may have allergies / wish to avoid ingredient / can identify any high risk foods included in product so that control can be put in place; cooking instructions – for best results / new product / inexperienced; storage instructions – to identify the best conditions in which to keep the product; serving suggestions / recipes – to give ideas to consumer; weight – to calculate unit cost / make comparisons / buy the amount required; use-by date / best before date – to indicate how long the product can safely be kept / used; special information – may indicate if bones / nuts are present which may endanger some consumers; special claims, e.g. reduced fat / no added sugar / added vitamin C / no artificial colourings – to enable wise choice;</p>	[15]

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	<p>vegetarian society symbol – so vegetarians know it is a suitable product; wheat ear symbol / gluten free – coeliacs can consume; may include nuts – avoid if allergic; halal / other information – suitable for certain religions; portions provided – to know how many can be served; kcal / kJ content per 100g / per serving – helps to plan a balanced diet; may give RDI for particular nutrients – shows proportion supplied by one serving; states type of fat – vegetarians will not wish to include animal fat in their diet; states how much of fat is saturated – for those with CHD / low cholesterol diet; quantity of sodium – for those with hypertension; amount of sugar – diabetics – for low-fat / slimming diet;</p>	
(b)	<p><i>reasons for preserving food [max 7]</i> to provide food when supply is limited / buy food when it is plentiful to use when scarce / to use in emergencies / famine / war; to enjoy food out of season; to cope with a glut / prevent waste; to give variety / different flavours / textures / new products made – jam, pickles; to prevent food spoilage (by destroying microorganisms) / to prevent the growth of microorganisms / to extend shelf life; to make food storage easier – qualified or with example; to allow food to be transported from area to area or between countries / to enjoy produce from other countries; to store food when the quality is best and cost is lowest / to save money – make uses of food when cheap; to retain as many of the qualities of fresh food as possible / flavour / colour / appearance / texture / nutritive value; to prevent the re-entry of microorganisms by sealing well;</p> <p><i>removing moisture [max 3]</i> drying removes water – microorganisms cannot multiply without water; drying method(s) discussed, e.g. freeze-drying, roller-drying, spray-drying, salting; relevant example, e.g. instant coffee / powdered milk;</p> <p><i>reducing temperature [max 3]</i> water in cells becomes frozen and unavailable for growth of bacteria; microorganisms cannot multiply at low temperatures / microorganisms become dormant; microorganisms multiply <u>more</u> rapidly at the temperatures in the refrigerator (comparison required); different method(s) discussed, e.g. cryogenic freezing, plate freezing; relevant example, e.g. store meat in the refrigerator / freeze vegetables;</p> <p><i>using sugar [max 3]</i> in jam making heat destroys / kills microorganisms; high sugar content / 60% added sugar prevents growth of microorganisms; water withdrawn from cells so too concentrated for microorganisms to thrive; sealed in jars which prevents entry of microorganisms; relevant example, e.g. jam-making / named jam;</p>	[15]