



FOOD AND NUTRITION

0648/13

Paper 1 Theory

October/November 2017

MARK SCHEME

Maximum Mark: 100

Published

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This document consists of **14** printed pages.

| Question | Answer | Marks |
|----------|---|-------|
| 1 | <i>difference between malnutrition and under nutrition</i> malnutrition is unbalanced / <u>incorrect intake</u> of nutrients; under nutrition is <u>not enough food</u> / insufficient amount of nutrients; | 2 |

| Question | Answer | Marks |
|-----------|---|-------|
| 2(a)(i) | <i>children require higher levels of protein</i> rapid growth / growth spurt; repair due to small children falling over; energy for activities due to age; | 1 |
| 2(a)(ii) | <i>athletes require higher levels of protein</i> energy for athletic pursuits; repair to damaged muscle tissue / muscle growth; | 1 |
| 2(a)(iii) | <i>women who are breastfeeding require higher levels of protein</i> repair of body cells after birth; energy for milk production; | 1 |
| 2(b) | <i>sources of high biological value protein</i> cheese; eggs; fish; meat; milk; soya; | 2 |
| 2(c) | <i>action of trypsin during the digestion of protein</i> converts protein to <u>peptones / peptides / polypeptides</u> ; | 1 |

| Question | Answer | Marks |
|----------|--|-------|
| 2(d) | <i>deficiency disease caused by a lack of protein</i> marasmus; kwashiorkor; | 1 |
| 2(e)(i) | <i>denaturation</i> (permanent / irreversible) change to structure / shape when heated / by acid; | 1 |
| 2(e)(ii) | <i>coagulation</i> setting / hardening when <u>heated</u> ; | 1 |

| Question | Answer | Marks |
|----------|---|-------|
| 3(a) | <i>difference between fats and oils</i> oils are liquid at room temperature, fats are solid at room temperature; oils are generally from plant sources, fats generally from animal sources; | 1 |
| 3(b) | <i>functions of fat in the body</i> warmth/heat/insulation; energy; energy store; protein sparing; protection of internal organs; solvent for fat-soluble vitamins / vitamins A, D, E, K; formation of cell membranes; increases calorific value of food without adding bulk; high satiety value / gives a feeling of fullness; provides essential fatty acids; | 4 |

| Question | Answer | | | | Marks | | | | | | | | | | | | | | | | | | | | |
|----------|---|---|---|--|---------|----------|------------|--------|---------|--|---|---|------|---|---------|--|--------|--|--|--|--------|---|--|--|---|
| 3(c) | <i>action of lipase during the digestion of fat</i> converts fats to <u>glycerol</u> and <u>fatty acids</u> ; | | | | 1 | | | | | | | | | | | | | | | | | | | | |
| 3(d) | <i>type of fat</i> <u>saturated</u> ; | | | | 1 | | | | | | | | | | | | | | | | | | | | |
| 3(e) | <i>why eating too much fat could cause heart disease</i> fat deposits lead to obesity which causes extra strain on heart; cholesterol is found in saturated fat which is deposited on artery walls; cholesterol narrows / blocks artery walls so flow of oxygen in blood reduced / stopped; | | | | 2 | | | | | | | | | | | | | | | | | | | | |
| 4 | <table border="1"> <thead> <tr> <th data-bbox="320 683 472 735">mineral</th> <th data-bbox="472 683 958 735">function</th> <th data-bbox="958 683 1332 735">deficiency</th> <th data-bbox="1332 683 1805 735">source</th> </tr> </thead> <tbody> <tr> <td data-bbox="320 735 472 959">calcium</td> <td data-bbox="472 735 958 959"></td> <td data-bbox="958 735 1332 959">rickets; osteomalacia; tetany; osteoporosis; osteopenia (low bone density);</td> <td data-bbox="1332 735 1805 959">dairy food or named example; bones of <u>canned</u> fish e.g. salmon; bread; hard water; green veg (or named example); wholegrain cereals; nuts or named example; pulses or named example;</td> </tr> <tr> <td data-bbox="320 959 472 1110">iron</td> <td data-bbox="472 959 958 1110">formation of haemoglobin / red pigment in blood / red blood cells; transports oxygen to cells / in blood / cell respiration;</td> <td data-bbox="958 959 1332 1110">anaemia</td> <td data-bbox="1332 959 1805 1110"></td> </tr> <tr> <td data-bbox="320 1110 472 1225">iodide</td> <td data-bbox="472 1110 958 1225">makes hormone thyroxine; controls rate at which energy is used / controls rate of metabolism;</td> <td data-bbox="958 1110 1332 1225"></td> <td data-bbox="1332 1110 1805 1225">seafood; milk; dairy food; vegetables grown near the sea; iodised salt</td> </tr> <tr> <td data-bbox="320 1225 472 1449">sodium</td> <td data-bbox="472 1225 958 1449">controls the amount of water in the body; maintains normal pH of blood; transmits nerve signals; helps muscular contraction; regulation of fluids in blood;</td> <td data-bbox="958 1225 1332 1449">headache; nausea / vomiting; muscle cramps; fainting; fatigue;</td> <td data-bbox="1332 1225 1805 1449"></td> </tr> </tbody> </table> | | | | mineral | function | deficiency | source | calcium | | rickets; osteomalacia; tetany; osteoporosis; osteopenia (low bone density); | dairy food or named example; bones of <u>canned</u> fish e.g. salmon; bread; hard water; green veg (or named example); wholegrain cereals; nuts or named example; pulses or named example; | iron | formation of haemoglobin / red pigment in blood / red blood cells; transports oxygen to cells / in blood / cell respiration; | anaemia | | iodide | makes hormone thyroxine; controls rate at which energy is used / controls rate of metabolism; | | seafood; milk; dairy food; vegetables grown near the sea; iodised salt | sodium | controls the amount of water in the body; maintains normal pH of blood; transmits nerve signals; helps muscular contraction; regulation of fluids in blood; | headache; nausea / vomiting; muscle cramps; fainting; fatigue; | | 8 |
| mineral | function | deficiency | source | | | | | | | | | | | | | | | | | | | | | | |
| calcium | | rickets; osteomalacia; tetany; osteoporosis; osteopenia (low bone density); | dairy food or named example; bones of <u>canned</u> fish e.g. salmon; bread; hard water; green veg (or named example); wholegrain cereals; nuts or named example; pulses or named example; | | | | | | | | | | | | | | | | | | | | | | |
| iron | formation of haemoglobin / red pigment in blood / red blood cells; transports oxygen to cells / in blood / cell respiration; | anaemia | | | | | | | | | | | | | | | | | | | | | | | |
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| sodium | controls the amount of water in the body; maintains normal pH of blood; transmits nerve signals; helps muscular contraction; regulation of fluids in blood; | headache; nausea / vomiting; muscle cramps; fainting; fatigue; | | | | | | | | | | | | | | | | | | | | | | | |

| Question | Answer | Marks |
|----------|--|-------|
| 5(a) | <i>effect of -18°C on bacteria</i> bacteria are dormant; no bacterial multiplication is possible; | 1 |
| 5(b) | <i>effect of 75°C on bacteria</i> bacteria are killed / destroyed at this temperature; | 1 |

| Question | Answer | Marks |
|----------|---|-------|
| 6(a) | <i>symptoms of scurvy</i> tiredness / weakness / fatigue; walls of blood vessels weaken / break and blood escapes / bruises appear under the skin; pain in muscles and joints; teeth loosen; swollen / bleeding gums; wounds slow to heal / scars reopen; poor absorption of iron / anaemia; bulging eyes / proptosis; scaly / cracking / dry / brownish skin; stunted bone growth in children; | 4 |

| Question | Answer | Marks |
|----------|--|-------|
| 6(b) | <p><i>prepare and cook green cabbage to retain its vitamin C content</i></p> <p>wash before cutting so vitamin C does not leach from cut cells; tear instead of cutting as tear follows cell walls and does not damage; do not shred too thinly less cell damage / expose too much surface to oxygen; use a sharp knife to prevent bruising / damaging cells; prepare just before cooking as vitamin C destroyed by enzymes from cell walls and by oxidation; do not soak as vitamin C is water soluble; use small amount of water for cooking as vitamin C is water soluble; boil water first so less leaching of vitamin due to prolonged cooking; lid on pan to speed up cooking time; do not overcook as vitamin C is destroyed by heat; use cooking liquid in sauces as it contains dissolved vitamins; do not add bicarbonate of soda which is alkaline and destroys vitamin C; cook by stir frying / microwaving due to speed of method so less exposure to loss of vitamin; steam as less contact with water to dissolve vitamin;</p> | 6 |

| Question | Answer | Marks |
|----------|---|-------|
| 7(a) | <p><i>methods used to make biscuits</i></p> <p>all-in-one / one-stage; melting; rubbing-in; whisking;</p> | 2 |
| 7(b)(i) | <p><i>type of flour and reason</i></p> <p>low gluten as no rise is required; plain flour as no raising agent is needed; rice flour / cornflour can be mixed to give shortness; wholemeal flour to give a nutty flavour / provide NSP; winter wheat / weak flour / soft flour / 0000 gives fine, even texture;</p> | 2 |

| Question | Answer | Marks |
|-----------|--|----------|
| 7(b)(ii) | <p><i>type of fat and reason</i></p> <p>butter or hard / block margarine for flavour / colour / good for rubbing in; soft/polyunsaturated margarine for ease of creaming / lower saturated fat;</p> | 2 |
| 7(b)(iii) | <p><i>type of sugar and reason</i></p> <p>caster for finer texture; granulated for crunchy texture; soft brown to give colour;</p> | 2 |
| 7(c) | <p><i>ways to decorate the biscuits after baking</i></p> <p>butter icing; caster sugar; fondant icing; frosting; glacé icing; (sieved) icing sugar; melted chocolate; piped cream;</p> | 3 |
| 7(d) | <p><i>advantages of using paper-board / card</i></p> <p>available in variety of colours; biodegradable; can be coated / laminated for strength; can be folded / flexible; can be made from recycled material; can be waxed for protection against moisture; cheap; easy to print on; lightweight; strong / sturdy structure / durable; recyclable; variety of thicknesses;</p> | 4 |

| Question | Answer | Marks |
|----------|--|----------|
| 7(e) | <p><i>information on a food label</i></p> <p>additives / allergens identified; address / 'phone / website of manufacturer; brand; cooking instructions; date marking; description; halal symbol; name of manufacture; name of product; ingredients; picture of product; price; recycle symbol; serving suggestion; storage instruction; special claims such as reduced fat / no added sugar / added vitamin C; vegetarian society symbol / suitability for vegans; weight; wheat ear / gluten free symbol;</p> | 5 |
| 8(a) | <p><i>label parts of egg</i></p> <p>A – yolk; B – shell; C – chalazae; D – air (sac / cell / space); E – white;</p> | 5 |

| Question | Answer | Marks |
|----------|---|----------|
| 8(b) | <p><i>guidelines when storing eggs</i></p> <p>air sac / blunt / round end up / pointed end down; in box or egg tray / rack; 0–5 °C/in refrigerator / cool / room temperature; store away from strong smelling foods; store away from raw meat / fish; use stock rotation / check best before dates; do not store cracked eggs; keep dry; do not wash; not too dry a place; if freezing separate egg yolk and white;</p> | 4 |
| 8(c) | <p><i>functions of eggs with examples</i></p> <p>binding / holds ingredients together e.g. rissoles / fish cakes / croquettes / marzipan; aeration / lightening / traps air e.g. mousse / soufflé / meringues / Swiss roll; glazing e.g. pastry dishes / bread; emulsifying e.g. mayonnaise / rich cakes; coating e.g. fish / Scotch egg; setting / coagulation / thickening e.g. quiche / baked egg custard / lemon curd / soup;</p> | 6 |

| Question | Answer | Marks |
|----------|---|----------|
| 8(d) | <p><i>groups who may be at risk from eggs</i></p> <p>babies; elderly; sick people; pregnant women; people with an allergy to eggs;</p> <p><i>reasons they may be at risk</i></p> <p>eggs are protein food ideal conditions for microorganism growth; eggs are moist ideal conditions for microorganism growth; eggs are easily contaminated due to porous shell; eggs may contain salmonella / eggs are dangerous if not cooked properly due to salmonella; inability to digest egg protein (lysine) / allergic reaction;</p> | 4 |

| Question | Answer | Marks |
|----------|--|----------|
| 9(a) | <p><i>type of vegetarian that does not eat eggs</i></p> <p>vegan / lacto-vegetarian;</p> | 1 |

| Question | Answer | Marks |
|----------|---|----------|
| 9(b) | <p><i>reasons why some people choose to follow a vegetarian diet</i></p> <p>religious beliefs e.g. Hinduism, Jainism, Rastafarians, Zoroastrianism; moral / ethical reasons e.g. object to slaughter / rearing conditions of animals; uneconomical use of land e.g. expensive to rear animals / more crops could be grown if land was used for cereals / more people could be fed from same area of land; dislike taste / texture / smell / appearance of animal flesh; believe vegetarian diet is more healthy e.g. animal fat is saturated / contains cholesterol / associated with CHD / lacks dietary fibre; animal products / meat more expensive than plant products / cereals / pulses; peer pressure / follow trends; family upbringing / tradition / custom; health scares e.g. bird 'flu / BSE / Salmonella from eggs / chickens; environmental issues e.g. methane from cows;</p> | 5 |

| Question | Answer | Marks |
|----------|--|-------|
| 10(a) | <p><i>Discuss and explain the specific nutritional needs of an elderly person. Suggest ways in which the elderly can save money when shopping for food</i></p> <p><i>nutritional requirements [max. 10 marks]</i> fewer fat / carbohydrate foods as they tend to be less active so this prevents obesity and associated diseases; protein foods to maintain and repair body cells; iron to help prevent anaemia / dementia / bleeding haemorrhoids; vitamin C to absorb iron / production of connective tissue / antioxidant; calcium / phosphorus to maintain bones and teeth / blood clotting / muscle function / prevents osteoporosis / osteomalacia / brittle bones; vitamin D to absorb calcium / phosphorus especially elderly who are housebound as they may have limited exposure to sunlight; increased NSP / dietary fibre prevention of constipation / diverticular disease / hernias / haemorrhoids / cancer of the colon / removal of toxins; vitamin B₁ / thiamin to release energy from carbohydrates / to help memory and concentration; vitamin B₃ / niacin / nicotinic acid prevention of dementia; vitamin B₁₂ (cobalamin) to prevent pernicious/anaemia; folate to prevent tiredness;</p> <p><i>saving money [max. 6 marks]</i> buy foods in season it is cheaper / better quality; only buy what is needed to prevent waste e.g. two apples not four; cheaper to buy in bulk if able to store correctly; use cheaper cuts of meat / fish; use cheaper protein sources such as eggs, milk, cheese, TVP; use pulses mix with other LBV protein to give HBV; have a shopping list to reduce impulse buys / only buy what is needed; look for special offers / reduced price / use 'money off' coupons; check 'sell by' dates to prevent wastage; do not have fixed meal plans look for bargains; buy supermarket's own brands as are often cheaper; compare prices between shops for 'best buy'; compare prices per 100 g / unit to get best value; shop locally to save transport costs / shop online; use markets as they are often cheaper;</p> | 15 |

| Question | Answer | Marks |
|----------|--|-------|
| 10(b) | <p><i>Discuss and explain the following aspects of microwave ovens:</i></p> <p><i>(i) how food is cooked in a microwave oven; (ii) disadvantages of cooking in a microwave oven; (iii) safety when using a microwave oven.</i></p> <p><i>how food is cooked in a microwave oven (5 marks)</i> microwaves heat food by radiation / electromagnetic waves; inside the oven is a machine that converts one form of energy into another / generator called a magnetron; the magnetron converts electricity into microwaves; microwaves vibrate millions of times per second; the food sits on a slowly spinning turntable so the microwaves cook it evenly; the microwaves bounce around the oven off the reflective metal walls of the compartment; when in contact with the food the energy from the microwaves causes water molecules in the food to start moving around / become excited / agitated; the molecules vibrate more quickly so the food gets hot; the hotter parts of the food will pass heat by conduction to the cooler parts giving uniform cooking throughout;</p> <p><i>disadvantages (5 marks)</i> not all foods can be cooked e.g. pastry / whole eggs; food does not brown / cannot easily judge when cooked ; food does not become crisp; flavours do not develop as food cooks quickly; not suitable for large pieces of food / joints of meat / chicken / as microwaves only penetrate 4 cm; no aluminium / metal dishes / metal decorations on china as causes arcing which can damage magnetron; depends on an appropriate electricity supply; easy to overcook due to speed of cooking; may need more attention than other methods of cooking; standing time required to allow cooking to continue so overcooking can occur; different thickness of food cook unevenly / food needs to be turned; liquids need to be stirred to allow even cooking or 'hot spots' occur; size of the oven cavity limits the quantity and size of the food to be cooked; some heat can be transferred to cooking dish by conduction;</p> | 15 |

| Question | Answer | Marks |
|----------|---|-------|
| 10(b) | <p><i>safety (5 marks)</i></p> <p>remove lid / cling film carefully to prevent scalding from steam; use oven gloves to remove containers from microwave as they may be heated from the food; avoid using containers made from soft pliable plastics / melamine / china with a metal rim / metal containers / aluminium foil and coloured paper products due to arcing; cover foods with cling film / paper towel / lid to prevent splashing / spitting; pierce holes in cling film / film lid / food such as potato to allow steam to escape; do not heat water or other liquids beyond the time recommended by the manufacturer / recipe; do not operate the microwave with wet hands; do not operate the microwave with a frayed flex / cracked plug; don't operate empty; check seal for leaks; unopened jars / air tight containers should not be heated in the microwave as they may explode; do not stir liquids when cooking time is finished as they may boil over due to being superheated;</p> | |