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**FOOD AND NUTRITION**

**6065/11**

Paper 1 Theory

**October/November 2017**

MARK SCHEME

Maximum Mark: 100

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**Published**

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

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

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

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

| Question | Answer  |   |   |  | Marks    |          |            |        |         |  |   |   |      |   |         |  |        |  |  |  |        |   |  |  |          |
|----------|---|---|---|--|----------|----------|------------|--------|---------|--|---|---|------|---|---------|--|--------|--|--|--|--------|---|--|--|----------|
| 3(c)     | <i>action of lipase during the digestion of fat</i><br>converts fats to <u>glycerol</u> and <u>fatty acids</u> ;  |   |   |  | <b>1</b> |          |            |        |         |  |   |   |      |   |         |  |        |  |  |  |        |   |  |  |          |
| 3(d)     | <i>type of fat</i><br><u>saturated</u> ;  |   |   |  | <b>1</b> |          |            |        |         |  |   |   |      |   |         |  |        |  |  |  |        |   |  |  |          |
| 3(e)     | <i>why eating too much fat could cause heart disease</i><br>fat deposits lead to obesity which causes extra strain on heart;<br>cholesterol is found in saturated fat which is deposited on artery walls;<br>cholesterol narrows / blocks artery walls so flow of oxygen in blood reduced / stopped;  |   |   |  | <b>2</b> |          |            |        |         |  |   |   |      |   |         |  |        |  |  |  |        |   |  |  |          |
| <b>4</b> | <table border="1" style="width: 100%; border-collapse: collapse;"> <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="320 735 472 954">calcium</td> <td data-bbox="472 735 958 954"></td> <td data-bbox="958 735 1332 954">rickets;<br/>osteomalacia;<br/>tetany;<br/>osteoporosis;<br/>osteopenia (low bone density);</td> <td data-bbox="1332 735 1805 954">dairy food or named example;<br/>bones of <u>canned</u> fish e.g. salmon;<br/>bread; hard water; green veg (or named example); wholegrain cereals; nuts or named example;<br/>pulses or named example;</td> </tr> <tr> <td data-bbox="320 954 472 1106">iron</td> <td data-bbox="472 954 958 1106">formation of haemoglobin / red pigment in blood / red blood cells;<br/>transports oxygen to cells / in blood / cell respiration;</td> <td data-bbox="958 954 1332 1106">anaemia</td> <td data-bbox="1332 954 1805 1106"></td> </tr> <tr> <td data-bbox="320 1106 472 1225">iodide</td> <td data-bbox="472 1106 958 1225">makes hormone thyroxine;<br/>controls rate at which energy is used / controls rate of metabolism;</td> <td data-bbox="958 1106 1332 1225"></td> <td data-bbox="1332 1106 1805 1225">seafood; milk; dairy food;<br/>vegetables grown near the sea;<br/>iodised salt</td> </tr> <tr> <td data-bbox="320 1225 472 1445">sodium</td> <td data-bbox="472 1225 958 1445">controls the amount of water in the body;<br/>maintains normal pH of blood;<br/>transmits nerve signals;<br/>helps muscular contraction;<br/>regulation of fluids in blood;</td> <td data-bbox="958 1225 1332 1445">headache;<br/>nausea / vomiting;<br/>muscle cramps;<br/>fainting;<br/>fatigue;</td> <td data-bbox="1332 1225 1805 1445"></td> </tr> </tbody> </table> |   |   |  | mineral  | function | deficiency | source | calcium |  | rickets;<br>osteomalacia;<br>tetany;<br>osteoporosis;<br>osteopenia (low bone density); | dairy food or named example;<br>bones of <u>canned</u> fish e.g. salmon;<br>bread; hard water; green veg (or named example); wholegrain cereals; nuts or named example;<br>pulses or named example; | iron | formation of haemoglobin / red pigment in blood / red blood cells;<br>transports oxygen to cells / in blood / cell respiration; | anaemia |  | iodide | makes hormone thyroxine;<br>controls rate at which energy is used / controls rate of metabolism; |  | seafood; milk; dairy food;<br>vegetables grown near the sea;<br>iodised salt | sodium | controls the amount of water in the body;<br>maintains normal pH of blood;<br>transmits nerve signals;<br>helps muscular contraction;<br>regulation of fluids in blood; | headache;<br>nausea / vomiting;<br>muscle cramps;<br>fainting;<br>fatigue; |  | <b>8</b> |
| mineral  | function  | deficiency  | source  |  |          |          |            |        |         |  |   |   |      |   |         |  |        |  |  |  |        |   |  |  |          |
| calcium  |   | rickets;<br>osteomalacia;<br>tetany;<br>osteoporosis;<br>osteopenia (low bone density); | dairy food or named example;<br>bones of <u>canned</u> fish e.g. salmon;<br>bread; hard water; green veg (or named example); wholegrain cereals; nuts or named example;<br>pulses or named example; |  |          |          |            |        |         |  |   |   |      |   |         |  |        |  |  |  |        |   |  |  |          |
| iron     | formation of haemoglobin / red pigment in blood / red blood cells;<br>transports oxygen to cells / in blood / cell respiration;   | anaemia   |   |  |          |          |            |        |         |  |   |   |      |   |         |  |        |  |  |  |        |   |  |  |          |
| iodide   | makes hormone thyroxine;<br>controls rate at which energy is used / controls rate of metabolism;  |   | seafood; milk; dairy food;<br>vegetables grown near the sea;<br>iodised salt  |  |          |          |            |        |         |  |   |   |      |   |         |  |        |  |  |  |        |   |  |  |          |
| sodium   | controls the amount of water in the body;<br>maintains normal pH of blood;<br>transmits nerve signals;<br>helps muscular contraction;<br>regulation of fluids in blood;   | headache;<br>nausea / vomiting;<br>muscle cramps;<br>fainting;<br>fatigue;              |   |  |          |          |            |        |         |  |   |   |      |   |         |  |        |  |  |  |        |   |  |  |          |

| Question | Answer   | Marks    |
|----------|--|----------|
| 5(a)     | <i>effect of <math>-18\text{ }^{\circ}\text{C}</math> on bacteria</i><br><br>bacteria are dormant;<br>no bacterial multiplication is possible; | <b>1</b> |
| 5(b)     | <i>effect of <math>75\text{ }^{\circ}\text{C}</math> on bacteria</i><br><br>bacteria are killed / destroyed at this temperature;               | <b>1</b> |

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

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

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

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

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



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

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

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

| 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;<br/> moral / ethical reasons e.g. object to slaughter / rearing conditions of animals;<br/> 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;<br/> dislike taste / texture / smell / appearance of animal flesh;<br/> believe vegetarian diet is more healthy e.g. animal fat is saturated / contains cholesterol / associated with CHD / lacks dietary fibre;<br/> animal products / meat more expensive than plant products / cereals / pulses;<br/> peer pressure / follow trends;<br/> family upbringing / tradition / custom;<br/> health scares e.g. bird 'flu / BSE / Salmonella from eggs / chickens;<br/> environmental issues e.g. methane from cows;</p> | <b>5</b> |

| 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><br/> fewer fat / carbohydrate foods as they tend to be less active so this prevents obesity and associated diseases;<br/> protein foods to maintain and repair body cells;<br/> iron to help prevent anaemia / dementia / bleeding haemorrhoids;<br/> vitamin C to absorb iron / production of connective tissue / antioxidant;<br/> calcium / phosphorus to maintain bones and teeth / blood clotting / muscle function / prevents osteoporosis / osteomalacia / brittle bones;<br/> vitamin D to absorb calcium / phosphorus especially elderly who are housebound as they may have limited exposure to sunlight;<br/> increased NSP / dietary fibre prevention of constipation / diverticular disease / hernias / haemorrhoids / cancer of the colon / removal of toxins;<br/> vitamin B<sub>1</sub> / thiamin to release energy from carbohydrates / to help memory and concentration;<br/> vitamin B<sub>3</sub> / niacin / nicotinic acid prevention of dementia;<br/> vitamin B<sub>12</sub> (cobalamin) to prevent pernicious/anaemia;<br/> folate to prevent tiredness;</p> <p><i>saving money [max. 6 marks]</i><br/> buy foods in season it is cheaper / better quality;<br/> only buy what is needed to prevent waste e.g. two apples not four;<br/> cheaper to buy in bulk if able to store correctly;<br/> use cheaper cuts of meat / fish;<br/> use cheaper protein sources such as eggs, milk, cheese, TVP;<br/> use pulses mix with other LBV protein to give HBV;<br/> have a shopping list to reduce impulse buys / only buy what is needed;<br/> look for special offers / reduced price / use 'money off' coupons;<br/> check 'sell by' dates to prevent wastage;<br/> do not have fixed meal plans look for bargains;<br/> buy supermarket's own brands as are often cheaper;<br/> compare prices between shops for 'best buy';<br/> compare prices per 100 g / unit to get best value;<br/> shop locally to save transport costs / shop online;<br/> 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><br/><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><br/>microwaves heat food by radiation / electromagnetic waves;<br/>inside the oven is a machine that converts one form of energy into another / generator called a magnetron;<br/>the magnetron converts electricity into microwaves;<br/>microwaves vibrate millions of times per second;<br/>the food sits on a slowly spinning turntable so the microwaves cook it evenly;<br/>the microwaves bounce around the oven off the reflective metal walls of the compartment;<br/>when in contact with the food the energy from the microwaves causes water molecules in the food to start moving around / become excited / agitated;<br/>the molecules vibrate more quickly so the food gets hot;<br/>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><br/>not all foods can be cooked e.g. pastry / whole eggs;<br/>food does not brown / cannot easily judge when cooked ;<br/>food does not become crisp;<br/>flavours do not develop as food cooks quickly;<br/>not suitable for large pieces of food / joints of meat / chicken / as microwaves only penetrate 4 cm;<br/>no aluminium / metal dishes / metal decorations on china as causes arcing which can damage magnetron;<br/>depends on an appropriate electricity supply;<br/>easy to overcook due to speed of cooking;<br/>may need more attention than other methods of cooking;<br/>standing time required to allow cooking to continue so overcooking can occur;<br/>different thickness of food cook unevenly / food needs to be turned;<br/>liquids need to be stirred to allow even cooking or 'hot spots' occur;<br/>size of the oven cavity limits the quantity and size of the food to be cooked;<br/>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;<br/>           use oven gloves to remove containers from microwave as they may be heated from the food;<br/>           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;<br/>           cover foods with cling film / paper towel / lid to prevent splashing / spitting;<br/>           pierce holes in cling film / film lid / food such as potato to allow steam to escape;<br/>           do not heat water or other liquids beyond the time recommended by the manufacturer / recipe;<br/>           do not operate the microwave with wet hands;<br/>           do not operate the microwave with a frayed flex / cracked plug;<br/>           don't operate empty;<br/>           check seal for leaks;<br/>           unopened jars / air tight containers should not be heated in the microwave as they may explode;<br/>           do not stir liquids when cooking time is finished as they may boil over due to being superheated;</p> |       |