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**FOOD AND NUTRITION**

**0648/12**

Paper 1 Theory

**May/June 2017**

MARK SCHEME

Maximum Mark: 100

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**Published**

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| <b>Question</b> | <b>Answer</b>   | <b>Marks</b> |
|-----------------|---|--------------|
| 1(a)            | undernutrition is not enough food / amount of nutrients;<br>overnutrition is too much food / too much of one or more nutrients;                                   | <b>2</b>     |
| 1(b)(i)         | kwashiorkor;<br>marasmus;<br>night blindness;<br>pellagra;<br>beri beri;<br>goitre;<br>rickets / osteomalacia;<br>scurvy;<br>anaemia;<br>osteoporosis;<br>tetany; | <b>2</b>     |
| 1(b)(ii)        | obesity;<br>dental caries;<br>CHD / atherosclerosis;<br>Diabetes / high blood sugar levels;<br>hypertension;  | <b>2</b>     |

| <b>Question</b> | <b>Answer</b>   | <b>Marks</b> |
|-----------------|---|--------------|
| 2(a)            | carbohydrates provide the body with energy;<br><br>vitamin B group releases energy to the body from carbohydrates;<br>energy from carbohydrates may be inaccessible if there is insufficient vitamin B group consumed;  | <b>2</b>     |
| 2(b)            | vitamin C helps the body absorb iron<br>iron is a vital component of haemoglobin found in red blood cells;<br>vitamin C plays a vital role in the synthesis of red blood cells;   | <b>2</b>     |
| 2(c)            | both involved in the transmission of nerve impulses;<br>both involved in muscle contraction;<br>both help regulate water content and electrolyte balance;<br>potassium helps counter the effects of sodium as it has a blood pressure lowering effect in people with raised blood pressure; | <b>2</b>     |

| <b>Question</b> | <b>Answer</b>  | <b>Marks</b> |
|-----------------|--|--------------|
| 3(a)            | growth;<br>repair;<br>maintenance / renewal;<br>energy;<br>manufacture of antibodies / enzymes / hormones; | <b>4</b>     |

| Question | Answer   | Marks    |
|----------|--|----------|
| 3(b)     | <p>protein foods which supply all the essential amino acids are said to have high biological value;</p> <p>protein foods which do not contain all the essential amino acids are said to be low biological value;</p> <p>proteins are built up of amino acid chains;<br/>there are 22 different naturally occurring amino acids;<br/>number, type and arrangement of amino acids varies so biological value of the protein also varies;<br/>(eight of the) amino acids are essential for tissue grown in adults;<br/>children need two additional essential amino acids;</p>  | <b>3</b> |
| 3(c)(i)  | <p><u>pepsin</u>;<br/>converts protein to <u>peptones</u> / <u>peptides</u> / <u>polypeptides</u>;<br/><u>rennin</u> clots milk;</p>   | <b>3</b> |
| 3(c)(ii) | <p><u>erepsin</u>;<br/>converts <u>peptones</u> / <u>peptides</u> / <u>polypeptides</u>;<br/>to <u>amino acids</u>;</p>  | <b>3</b> |
| 3(d)     | <p>chemical structure denatured / changed;<br/>coagulation / setting occurs / becomes firm / hardens;<br/>this is permanent / irreversible;<br/>protein becomes less soluble when heated;<br/>normal heat makes protein more digestible;<br/>overheating makes protein difficult to digest / 'rubbery' / reduces its nutritive value;</p>  | <b>3</b> |
| 3(e)     | <p>soya is only vegetable source of HBV protein / contains all essential amino-acids;<br/>useful for vegans / vegetarians as source of protein;<br/>good source of NSP / fibre;<br/>low in total calories;<br/>(follows dietary guidelines due to) being low in fat;<br/>(follows dietary guidelines due to there being) no saturated fat / cholesterol;<br/>is cheap to buy;<br/>is easy to transport / does not require refrigerated vehicles / is lighter in weight to carry;<br/>is dehydrated so easy to store;<br/>has a long shelf life;<br/>requires no preparation other than soaking;<br/>no waste produced during preparation;<br/>is easy to cook / cooks quickly so saves on fuel and time;<br/>takes on flavour of dish being created;<br/>versatile as it is available in many forms such as sausages / mince / chunks;<br/>can be used as a meat replacement / substitute;<br/>can be used as a meat extender to give a cheaper product;<br/>no chance of BSE / bird flu;<br/>alternative to cows milk if allergy;</p> | <b>6</b> |

| Question | Answer  | Marks |
|----------|---|-------|
| 4        | <p>prevents dehydration / hydrates the body;<br/> required for all body fluids digestive juices / mucus / plasma / saliva / blood / lymph / sweat / urine;<br/> regulates body temperature (through perspiration);<br/> helps digestion;<br/> helps removal of toxins;<br/> improves concentration / brain function;<br/> lubricates (muscles and joints / AVP);<br/> transports nutrients around the body;<br/> improved absorption of water soluble vitamins / B vitamins / vitamin C;<br/> required for metabolic / chemical reactions;<br/> helps the removal of waste / faeces;<br/> combines with NSP to reduce risk of bowel disorders / constipation / diverticular disease / helps make faeces soft / bulky;<br/> reduce risk of kidney problems / stones;<br/> decrease risk of migraines / headaches;<br/> less risk of high blood pressure;<br/> needed during lactation for milk production;</p> | 6     |

| Question | Answer  | Marks |
|----------|---|-------|
| 5(a)     | <p>add moisture such as gravy with roast meat / custard with apple pie;<br/> add nutrients such as milk / egg in custard / chocolate sauce / cheese sauce;<br/> add colour such as tomato sauce with pasta / jam sauce / chocolate sauce;<br/> add flavour such as cheese sauce with cauliflower / mint sauce / apple sauce;<br/> counteract richness such as apple sauce with roast pork / orange sauce with duck;<br/> add interest / variety such as curry sauce / chocolate sauce with ice-cream;<br/> add contrasting texture such as bread sauce with roast poultry / tartare sauce with fried fish;</p> <p>bind ingredients together such as fish cakes or croquettes;</p> | 8     |
| 5(b)     | <p>melt margarine on low heat;<br/> add / stir in flour with wooden spoon to form a roux;<br/> cook roux over gentle heat stir all the time until sandy / crumbly / paste;<br/> do not allow to brown as it is a white sauce;<br/> remove from heat;<br/> add milk gradually;<br/> stirring all the time;<br/> return to heat and bring to boil stirring continually;<br/> boil for 3 minutes (to cook starch so grains will burst and absorb the milk);<br/> sauce will thicken (as starch gelatinises);</p>   | 5     |
| 5(c)(i)  | <p>milk added too quickly / too much milk added at a time;<br/> milk added on heat;<br/> not stirred well (between each addition of milk);<br/> not stirred during boiling;</p>   | 2     |

| Question | Answer   | Marks |
|----------|--|-------|
| 5(c)(ii) | inaccurate weighing and measuring;<br>too much liquid;<br>insufficient flour;<br>not heated enough / insufficient time at correct temp;<br>starch has not gelatinised;<br>undercooked; | 2     |

| Question | Answer   | Marks |
|----------|--|-------|
| 6(a)     | mixture rises;<br>mixture becomes light / fluffy;<br>product has open texture;<br>product is easier to digest;<br>product is more attractive;  | 2     |
| 6(b)     | <u>sieving</u> ; flour for shortcrust pastry / scones;<br><u>creaming</u> ; fat and sugar for rich cakes;<br><u>rubbing in</u> ; fat and flour for shortcrust pastry;<br><u>whisking egg white</u> ; meringue / soufflé;<br><u>whisking eggs and sugar</u> ; Swiss roll / (sponge) cake;<br><u>beating</u> ; eggs before adding to creamed mixtures;<br><u>rolling and folding</u> ; flaky pastry / puff pastry; | 8     |
| 6(c)     | alkali / bicarbonate of soda / sodium bicarbonate / baking soda;<br>acid / cream of tartar;<br>starch filler / corn flour / corn starch / anti-caking agent;   | 3     |
| 6(d)     | an airtight container is moisture / water proof / keeps out air / oxygen;<br>dampness causes a reaction between acid and alkali;<br>carbon dioxide would be given off;<br>when damp mixture used there would be a poor reaction so product would not rise properly;  | 2     |
| 6(e)     | carbon dioxide;  | 1     |
| 6(f)     | water changes to steam;<br>when it reaches boiling point / 100 °C;<br>the steam pushes up the mixture as it escapes;<br>the steam will rise / expands / (as less dense);   | 2     |
| 6(g)     | any choux pastry dishes;<br>any batter dishes;<br>any flaky pastry dishes  | 2     |

| Question | Answer  | Marks |
|----------|---|-------|
| 7        | <p>space available inside the kitchen;<br/> family size / capacity / storage needs per person;<br/> larger refrigerator;<br/> amount of money available;<br/> refrigerator with a freezer compartment on top / refrigerator with a freezer compartment on bottom / refrigerator and freezer side by side;<br/> built-in refrigerator / free-standing / under-counter;<br/> colour / trim panels to match kitchen cabinets;<br/> restaurant-style glass doors;<br/> noise during operation;<br/> energy efficiency / rating;<br/> star rating for frozen food compartment;<br/> automatic defrosting / frost free<br/> manufacturer's name;<br/> door shelving are adjustable in height to fit various height bottles and containers;<br/> in-door ice and water dispensers;<br/> spill proof shelves designed with catch-edges and raised front and rear lips prevent spills from spreading to other shelves;<br/> beepers to alert when a door is left ajar;<br/> lights turn on when it's time to change the water filter;<br/> temperature controls;<br/> warranty;<br/> ease of cleaning;</p> | 8     |

| Question | Answer  | Marks |
|----------|---|-------|
| 8(a)     | <p><b>Describe the nutritional requirements of an adolescent and discuss some of the issues which may increase an adolescent's risk of developing obesity.</b></p> <p><b>Nutritional Requirements</b><br/> high energy / energy-dense food;<br/> more energy needed for the rapid growth spurt / building new tissue;<br/> need for high energy food due to high levels of activity;<br/> protein for growth spurt / body building / muscle development / repair / production of hormones;<br/> calcium / phosphorus / vitamin D for skeletal growth / bones / teeth;<br/> greater risk of osteoporosis later in life if inadequate;<br/> vitamin D for absorption of calcium;<br/> vitamin B release of energy from carbohydrate;<br/> iron to carry oxygen for haemoglobin / cell respiration / energy release / blood loss during menstruation;<br/> vitamin C for absorption of iron;</p> <p><b>Issues</b><br/> need to show individuality / non-conformity;<br/> poor eating habits formed in childhood;<br/> grazing rather than eating a 'proper' meal / skipping meals resulting in snacking;<br/> participate in more sedentary activities in front of screens;<br/> passive eating;<br/> snacks high in fat / sugar / soft drinks;<br/> do not walk / cycle to school / lack of physical activity;<br/> spend more time indoors;<br/> poor food choices / lack of nutritional knowledge;<br/> more disposable income / 'junk food' cheaper;<br/> more freedom to choose their own food;<br/> reject food which parents may provide as 'healthy';<br/> open to persuasion of advertising / media of high fat / sugar food;<br/> emotional use of food due to relationship issues / bullying / stress;<br/> peer pressure / conforming with friends to eat fast food / eating fast food is fashionable;<br/> eat less food containing NSP so snack more often as no satiety;<br/> eat more convenience / takeaway / 'junk' food at home as parents both work;</p> | 15    |

| Question | Answer   | Marks     |
|----------|--|-----------|
| 8(b)     | <p><b>Outline ways to be economical with food and fuel when planning, preparing and cooking family meals.</b></p> <p><b>Food</b><br/> have a budget and stick to it;<br/> plan the meals you are going to eat / make a shopping list;<br/> buy in bulk as long as the product does not have a short shelf life;<br/> buy foods in season / use garden produce / pick your own / local farms / markets;<br/> own country of origin foods;<br/> compare / research online prices in different shops;<br/> check the unit price on foods eg price per kg so price comparisons can be made;<br/> buy store's own brand / make use of special offers in shops / save 'money off' coupons;<br/> check best before date so there is a longer time to use / less waste;<br/> store products correctly / use stock rotation so products keep longer so less waste;<br/> peel fruit and vegetables thinly to avoid waste;<br/> do not cook more food than is necessary for the meal;<br/> use cheaper sources of protein such as milk / cheese / eggs / soya products / pulses;<br/> use convenience / processed foods with care as they are usually more expensive than fresh / make your own dishes rather than buying pre-prepared;<br/> use cheaper cuts of meat;<br/> tinned and frozen fruit and vegetables can be cheaper than fresh;<br/> use left over food as next day meals;<br/> buy food reduced at end of day;</p> | <b>15</b> |



| Question | Answer   | Marks |
|----------|--|-------|
| 8(b)     | <p><b>Fuel</b></p> <p>make one pot meals in slow cookers so only use one heat source;<br/>           cook in bulk / freeze or eat the next day;<br/>           don't cook separate meals for individuals in the family;<br/>           use steamer so several layers share one hot plate;<br/>           use a pressure cooker which cooks quicker so uses less fuel;<br/>           cut food into smaller pieces so it cooks quicker;<br/>           keep a lid on the pan to retain heat and cook faster;<br/>           use a small amount of water in kettle / pan;<br/>           do not overcook;<br/>           cook when needed so no need to reheat;<br/>           use a microwave which is faster so uses less fuel;<br/>           size of pan should fit hot plate to avoid wasting fuel around base of pan;<br/>           gas flames should not come around base of pan or heat is wasted;<br/>           cook the whole meal in the oven or on hob; batch bake to use all oven shelves;<br/>           do not preheat oven for too long;<br/>           turn off heat before cooking finished to use residual heat;<br/>           use flat based pans for good contact between burner and pan;<br/>           use quick methods such as frying / grilling;<br/>           choose materials which are good conductors of heat for pans such as copper / iron;<br/>           use divided pans;<br/>           boil two things together such as potatoes and carrots;</p> |       |