CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 series

0648 FOOD AND NUTRITION

0648/01 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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

Mark schemes will use these abbreviations

- ; separates marking points
- / alternatives
- **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
- max indicates the maximum number of marks
- *italics* used to denote words or phrases from the question

	Answer		
1 (a)	*minerals* iodine; phosphorous; sodium *vitamins* vit D / cholecalciferol; vit B; vit A / retinol; vit B_2 / riboflavin; vit B_{12} / cobalamin; vit B_9 / folate		
(b)	osteoporosis; rickets; osteomalacia / adult rickets; tetany	**max [2]**	
(c)	rickets: soft bones; bent legs; pigeon chest; bow legs; bone deformities; fragile skull osteomalacia: weak bones; easily fractured; painful joints osteoporosis: brittle bones; easily fractured; decreasing height; porous bones tetany: muscle cramps / spasms	**max [2]**	no mark for renaming disease refer to one disease only
(d) (i)	vit D / cholecalciferol	**[1]**	
(ii)	<u>oily</u> fish / salmon / sardines / cod liver oil; eggs; liver; milk / cheese / yogurt / dairy products; margarine / butter; fortified breakfast cereals / named breakfast cereal; powdered milk / Marvel	**max [2]**	
(e)	green <u>leafy</u> vegetables / broccoli / cabbage / brassica vegetables; okra; soya beans / tofu; soya drinks with added calcium; seeds / nuts / brazil nuts / almonds / pecans / walnuts / cashews / pistachios; pulses; bread	**max [2]**	
(f) (i)	coating sauce is thicker than pouring sauce; coating sauce uses less milk / liquid; coating sauce clings to foods / coats foods / named example, e.g. cauliflower cheese; **ORA**	**max [2]**	
(ii)	50 g *plain flour*; *500 ml* milk / water / stock	**[1]** **[1]**	

	(iii) melt fat; add flour and stir; heat gently for 1 min; starch granules soften; roux formed; remove from heat; gradually add milk; to form smooth paste; return to heat; stir constantly; bring to boil; starch granules burst; gelatinise; cook for 2 min; remove from heat; add in grated cheese immediately; do not return to heat		
	(g) (i) physical breakdown; teeth tear food into small pieces; small enough to swallow; tongue pushes food down throat; saliva moistens food for swallowing; no chemical breakdown of fat; no chemical breakdown of protein	**max [1]**	
	(ii) no physical breakdown; glands produce intestinal juice; protein digestion is completed; erepsin; converts peptones; to amino acids; fat further broken down; by lipase; into glycerol; and fatty acids; lactase; breaks down lactose; into glucose and galactose	**max [3]**	2 points = 1 mark
2	**(a)** more expensive than fresh foods; contain additives; small portion size; high in fat; high in sugar; consumers become deskilled; excessive packaging; nutrients may be lost and not replaced; lack NSP	**max [2]**	2 points = 1 mark
	(b) sugar absorbed into plaque on teeth; sugar broken down by microorganisms; sugar turned into acid; pH of plaque falls below 5.5; tooth enamel dissolves; weak area is left; cavity develops; whole tooth damaged / irreplaceable	**max [4]**	
	(c) diabetes: high blood sugar glucose; lack of insulin obesity: sugar high in calories; excess adipose tissue forms; under skin and around internal organs coronary heart disease; high blood sugar level leads to diabetes; more than doubles risk of developing CHD; lining of blood vessels becomes thicker; restricts blood flow; heart works harder	**[3]**	refer to 1 disease only 1 mark for naming disease; 2 marks for linked explanation

	(d)	buttered syrup; cane juice crystals; caramel; carob syrup; corn syrup; dextran; fruit juice concentrate; glucose; golden syrup; mannitol; maltodextrin; molasses; refiner's syrup; sorbitol; sorghum syrup; sucrose; fructose; maltose; honey; lactose; maple syrup		
	(e)	carbon, hydrogen, oxygen		
	(f)	dry heat on starch; breaks down starch to dextrin; dextrins are yellow and brown; named example/apple pie; non-enzymic browning	**max [2]**	
3	**(a)**	heat energy can be transferred from one point to another; heat flows from a high temperature to a lower one; until a constant temperature is achieved; heat transferred quickly through movement of liquid molecules / liquids; and gas molecules / gas; hot liquid expands and rises; cooler liquid takes its place; cooler liquid heats up; this expands and rises; convection current established; liquid becomes less dense; boiling / steaming / baking	**max [6]**	up to 2 marks available for a suitable diagram
	(b)	blood pressure is abnormally high; causes the heart to work harder; exerts pressure on blood vessels; may damage arteries; fat deposits in arteries; narrows space for blood flow; salt causes tissues to retain water; contributes to increased blood pressure; may develop heart disease; have a stroke	**max [5]**	
	(c)	a method of food preservation; using heat treatment; destroys (pathogenic / souring) bacteria found in milk / fruit juice / vegetable juice / beer; heated to 72°C; for 15 s; Holder method; heated to 63°C for 30 min; cooled quickly; to below 10°C; to prevent loss of nutrients; appearance / taste unaltered	**max [5]**	
(4)	**(a)**	*cake sunk in middle.* too much sugar; too much raising agent; under cooked; oven door opened whilst cooking *cake risen unevenly.* oven shelf not level; cake near oven's heat source *cake risen to a peak.* cooked too quickly because oven too hot; too much mixture in tin; cake on high shelf; too much raising agent *cake has hard, sugary crust.* too much sugar; didn't use caster sugar	**max [4]**	all 4 causes required for full marks

(b)	shaping; proving	**[1]** **[1]**	
(c)	to mix the ingredients; to add strength to the final product; to form gliadin and glutenin proteins; proteins expand and form strands of gluten; kneading aids gluten production; kneading warms and stretches gluten strands; gluten gives bread its texture / creates a springy and elastic dough; if not kneaded enough will not be able to hold pockets of CO_2 / will collapse / result in heavy/dense loaf	**max [3]**	
(d)	*carbohydrate* 4 kcal / 16 kJ; *fat* 9 kcal / 37 kJ;	**[1]** **[1]**	
5 (a)	*Safe storage of food* *flour* (dry) container; cool; sealed; *cheese* wrapped in refrigerator / 1–5°C; *potatoes* (dry) dark cupboard; cool; *frozen fish* wrapped in freezer; –18°C	**[4]**	
(b)	diarrhoea; vomiting; fever; abdominal pain; nausea; double vision; headache	**max [3]**	
(c)	contains listeria / bacteria / not pasteurised woman may experience 'flu like symptoms / still birth / miscarriage / pneumonia / meningitis / blood poisoning; **AVP**	**[1]** **[1]**	
(d)	wear a hair net; beard net; wash hands thoroughly; dry with paper towel; remove jewellery; cover cuts with blue plaster; cut nails short; clean nails; no nail varnish; clean overall / apron; do not lick fingers; wash hands after blowing nose; wash hands after using toilet; do not pick scabs / spots; do not go to work if ill / suffering from diarrhoea / coughing; **AVP**	**max [3]**	2 points = 1 mark
(e) (i)	stainless steel; marble; food grade plastic; granite; ceramic	**max [1]**	
(ii)	smooth; washable; non-toxic; non-porous: attractive; **AVP**	**max [2]**	
(f)	switch off / isolate appliance; do not touch the person until the appliance has been switched off; push appliance away from the person with dry wood / broom handle; check person is breathing / airway; resuscitate if needed; call for emergency assistance	**max [3]**	

6 (a)	*nutritional needs of a pregnant woman* 2500 calories per day; approximately 35% of calories should come from fat; approximately 55% of calories should come from carbohydrates; approximately 10% of calories should come from protein iron; to produce all the blood needed to supply nutrition to the placenta; prevent anaemia vit B_9 / folic acid/folate; prevention of spina bifida essential fatty acids; linoleic acid / linolenic acid; needed for fetal brain growth vit D; prevent low birth weight; osteomalacia in the mother vit B_{12}; fetus stores mother's B_{12} supply to use in first sixth months after birth calcium; fetus may use calcium from mother's skeleton to supply its own skeleton NSP; prevention of constipation *reasons for following a vegetarian diet when pregnant* believe that vegetarian diet is more healthy; animal fat has cholesterol; associated with CHD; obesity; meat is high in fat; don't want to put on too much weight during pregnancy recent health scares; BSE / bird 'flu etc.; illness could affect the health of the fetus cooked and raw meat products often the cause of food poisoning; campylobacter / salmonella / *E.coli*; want to avoid vomiting and diarrhoea during pregnancy should avoid pâté; contains listeria; liver / liver sausage; too much vit A; can harm fetus shark meat / marlin / swordfish / excess tuna; contains mercury; can damage fetus' nervous system cold cured meats / salami / parma ham / chorizo / pepperoni; may harbour listeria; toxoplasma parasite sushi; fish may contain small parasitic worms; raw shellfish; bacteria and viruses all easy to avoid if following vegetarian diet *reasons for not following a vegetarian diet when pregnant* may lack vit A / beta carotene; may lack vit D; may lack	• three or four reasons for not following a vegetarian diet identified • detail of reasons given • ways of getting the required nutrients safely given • examples given • awareness of several possible problems for vegetarian pregnant women shown • information is specific • information is usually accurate • all areas of the question addressed • uses technical terms appropriately • sound knowledge of the topic apparent **max [15]**

	calcium; may lack iron; may lack B vits; especially B_9 / folate; B_{12} / cobalamin; may lack fat; essential fatty acids; may lack protein; may lack HBV protein; may lack iodine may find a vegetarian diet monotonous intake of NSP may be too high; may interfere with absorption of minerals *ways to ensure that pregnant women following a vegetarian diet get sufficient nutrients* may be able to eat HBV protein foods from animals; if ovo-lacto vegetarian; eggs / milk / cheese / yoghurt; must still follow safety advice about eggs and cheese can complement or pair protein foods; essential amino acids missing from one are supplied by the other; combine HBV and LBV proteins in same meal; e.g. egg fried rice; combine LBV protein foods in same meal; cereals / nuts / pulses; beans on toast; eat soya products for HBV protein; tofu / soya milk / soya flour / tempeh / TVP; eat quorn; quorn mince / burgers / fillets; vit A / beta carotene; eat carrots / green vegetables; margarine; vit D; added to margarine; available from sunlight; calcium; from dairy products / pulses / nuts / green leafy vegetables; iron; green leafy vegetables / pulses / dried fruit / cocoa; B vits; bread / yeast extract / wholegrain cereals; iodine; vegetables grown near the sea; fat; vegetable oil / nuts / dairy	
OR		
(b)	*refrigerator preservation:* *advantages* food stored between 1°C and 5°C; bacterial growth inhibited but not prevented; most homes have a fridge; can refrigerate leftovers for use the next day; shelving allows storage of a large quantity of food at one time; different areas of fridge help to preserve different types of food; crisper tray for salad; excellent for extending the life of food with short shelf life *disadvantages* can only store foods for short periods / a few days; can't store an autumn harvest until the following spring fridge does not add flavour; does not add colour; does not improve appearance; does not add nutritional value microorganisms are not killed and will multiply when food is removed from fridge; food is not sealed in the fridge;	2 points = 1 mark **candidate may agree or disagree with the statement but should attempt to justify their thoughts.** must show good understanding for full marks, e.g.: • three or four reasons for using other methods of preservation identified • detail of reasons given • reasons justified • at least four other types of

	fridge can make some foods dry out, e.g. bread; syneresis not prevented by refrigeration; flavours and smells of different foods can merge and some food can taste tainted; some foods cannot be stored in the fridge, e.g. bananas; go brown quickly; foods are so cold that their flavour is temporarily inhibited; expensive to run; initial cost of fridge high; fridge is not portable; food remains in the home or workplace *reasons for preservation* add variety to the diet; make foods available out of season; make use of a glut of food; use food when it is cheap; store for later use make a different product out of the food; strawberries into strawberry jam / cauliflower into piccalilli *other methods of preservation* addition of a chemical preservative; pickling / salting / jamming; flavour changed / enhanced; food is versatile / becomes a new product reduction of temperature; freezing; to inhibit microbial and enzyme activity drying; to inhibit microbial growth; food is lightweight; portable irradiation; destruction of microorganisms heating; bottling; sterilisation; pasteurisation; to destroy microorganisms and enzyme activity *importance of other methods of preservation to consumers* consumers like choice; fresh chilli can be stored in fridge; dried chilli will last months and can be stored in a bag / cupboard consumers want “perfect” looking food; irradiation prevents “eyes” growing on potatoes consumers do different activities; camping / survival / armed forces; want portable / lightweight food in small packets; cannot carry fridge around milk is important to consumers; untreated milk would be a danger to many groups of people; children / elderly / sick; heat treatment vital; fridge useful after the heat treatment increase in convenience foods relies on a variety of preservation methods to give variety to consumer; dehydrated noodles / frozen meals / canned sponge	appropriately • sound knowledge of the topic apparent **max [15]**

	puddings; freezer is very convenient / consumers rely on freezer foods for quick meals; fish fingers and chips some consumers grow own produce; need a way of using all of their harvest