CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2

0648 FOOD AND NUTRITION

0648/13 (Written) 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 October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

Section A

1 (a) Elements in fat
carbon; hydrogen; oxygen;

(b) (i) Monounsaturated fat
one double bond (carbon to carbon) in molecule;
more hydrogen (**one** pair of atoms) can be taken up by th
(accept information in diagrammatic form)

(ii) Polyunsaturated fat
more than one double bond (carbon to carbon) in molecule;
can take up more hydrogen (**more than one** pair of atoms);
(accept information in diagrammatic form) **2 × 1 mark [2]**

(iii) Saturated fat
single bonds (carbon to carbon) in molecule;
cannot take more hydrogen;
(accept information in diagrammatic form) **2 × 1 mark [2]**

(c) Health problems associated with a diet high in saturated fat
excess fat / adipose tissue stored under skin / around internal organs;
overweight / obesity;
saturated fat contains cholesterol;
sticks to / narrows / blocks artery walls;
heart attack / CHD; stroke; hypertension;
low self-esteem; breathlessness; arthritis; problems during surgery; **3 × 1 mark [3]**

(d) Substance which emulsifies fat
bile; **1 mark [1]**

(e) End products of digestion of fat
glycerol;
fatty acids; **2 × 1 mark [2]**

(f) (i) Finger-like projections
villi; **1 mark [1]**

(ii) System of which lacteal is a part
lymphatic system; **1 mark [1]**

2 (a) Functions of vitamin A
formation of visual purple;
for night vision;
keeps mucous membranes moist;
healthy skin;
growth of bones / teeth;
antioxidant;
growth and development:
Do **not** accept night blindness unless not stated in **2(c)**

(b) Sources of vitamin A
milk; cheese; butter; margarine; eggs; oily fish (or named example);
liver; kidney; fish liver oils;
(beta-carotene (precursor of vitamin A) found in plants);
carrots; tomatoes; green vegetables (or named example);
oranges; apricot; pumpkin; sweet potato; butternut squash; **2 × 1 mark [2]**

(c) Deficiency disease
night blindness / Xerophthalmia; **1 mark [1]**

(d) Deficiency diseases and associated nutrients

kwashiorkor / marasmus	protein;
beriberi	vitamin B1 / thiamine;
eye disorders / swollen tongue etc.	vitamin B2 / riboflavin;
pellagra	vitamin B3 / nicotinic acid / niacin;
pernicious anaemia	vitamin B12 cobalamin;
scurvy	vitamin C / ascorbic acid;
rickets / osteomalacia	vitamin D / cholecalciferol / calcium;
osteoporosis	calcium;
muscle cramps	sodium chloride / salt / potassium;
anaemia	iron;
goitre	iodine;

N.B. Do not credit nutrient without named deficiency disease.
2 deficiency disease **2 × 1 mark**
2 nutrients in poor supply **2 × 1 mark [4]**

3 (a) Excess sugar
tooth decay; bacteria; act on sugar / sugar converted to acid; forms plaque / dissolves enamel / causes gum disease / bad breath;
obesity; excess sugar converted to fat or adipose tissue; stored under skin / around internal organs / arteries narrow or block; hypertension / CHD / stroke;
diabetes mellitus; insufficient insulin made; in pancreas;
glucose remains in blood; can cause circulation / eye problems, etc.;
Three **named** problems **with** description **3 × 1 mark [3]**

(b) Excess protein
protein cannot be stored; deamination / nitrogen removed; in liver;
excreted as urea / urine; from kidneys; remainder is carbon, hydrogen, oxygen;
used for energy; or stored as fat;
3 × 1 mark [3]

4 (a) Encouraging children to eat fruit and vegetables
introduce at an early age e.g. stewed fruit / mashed banana;
serve as drinks, e.g. smoothies / juice;
encourage as healthy snacks, e.g. bananas / raisins;
include in packed meals, e.g. oranges / apples / sticks and di
use to decorate foods, e.g. pineapple / cherries;
include as starters, e.g. soups;
include in main course dishes, e.g. casseroles / pizza / wraps
include as desserts, e.g. fruit fool / fruit salad / kebabs;
cut into bite size / interesting / creative shapes, e.g. dice, star
parents set an example by eating with children;
give a variety of flavour / texture / colour;
vary cooking method;
introduce new types of fruit and vegetables on a regular basis;
offer small portions;
Answer should include an example to illustrate point made **4 × 1 mark** **[4]**

(b) Importance of soya in vegan / strict vegetarian diet
only plant source of HBV protein;
contains all indispensable amino-acids;
soya products / flour / tofu / milk / tempeh;
TVP / made to resemble or replace meat by added colours and flavours;
shaped (e.g. into sausages / burgers / chunks / mince);
low in fat / no cholesterol;
cheaper / easy to store / easy to cook; **4 × 1 mark** **[4]**

[Section A Total: 40]

Section B

5 (a) Safety when frying

deep pan – enough room for oil and food –
space for turning food without overflowing –
pan no more than half full of oil – does not overflow when foo
lower food into pan gently – to avoid splashing fat –
do not overfill pan with food – danger of overflowing –
do not overheat fat – monitor temperature of fat – may ignite
make sure food is dry – water turns to steam and splutters –
make sure equipment is dry – danger from splashing –
pan handle turned in – in case it is knocked over –
back burner if possible – less chance of being knocked over –
flat base on frying pan – so it sits securely on hotplate –
do not leave unattended – may ignite / overflow –
turn heat off if fat begins to smoke – fat is near flash point –
have cover / lid nearby – in case of fire –
do not move pan when fat is hot –
oven gloves when holding pan handle – may be hot / fat may splash –
pan should fit burner / flame should not lick around edge of pan –

MARK BANDS		**Marks**
High	good understanding including 8 or more points	**4–5**
Medium	some understanding and 4–7 points	**2–3**
Low	little understanding, has mentioned 1–3 points	**1**

[5]

(b) Personal hygiene in the kitchen

wash hands – before/after handling all foods / after toilet / –
to avoid cross-contamination –
do not cook if ill / no coughing / sneezing over food – so bacteria are
not passed to others –
tie back / cover long hair – bacteria from hair could get into food –
no long fingernails – dirt / bacteria collect underneath – remove nail varnish –
remove rings –
clean apron / no outdoor clothes – to avoid transfer of bacteria from outside –
do not touch face/body during food preparation – bacteria from skin could get onto food –
cover cuts/wounds with waterproof dressings – bacteria could get into food –
no licking spoons / fingers – bacteria from mouth transferred to food –
handle food as little as possible – avoids transfer of bacteria –

MARK BANDS		**Marks**
High	good understanding including 8 or more points	**4–5**
Medium	some understanding and 4–7 points	**2–3**
Low	little understanding, has mentioned 1–3 points	**1**

[5]

(c) Advantages and disadvantages of small electrical kitchen equ

Advantages
save time – save labour / effort / energy – save fuel e.g. micr
may be more efficient / thorough – can cope with large quanti
can do a range of jobs – blender can make soup / mayonnais
attachments available to extend use – dough hook / whisk –
can be used in different containers / mixing bowl / pan –
can use anywhere where there is a power supply / portable –
need not hold when in use – free-standing mixer for bread, ca

Disadvantages
initial cost – cost of electricity to operate – may buy and not use –
difficult to assemble – may be difficult to clean –
care needed not overfill liquidiser – danger of burns with hot equipment –
danger of sharp blades – do not use near water – caution needed for loose wires –
electric shocks – specialist to repair – added cost –
need suitable storage space – must use where no-one will trip over trailing flexes –

MARK BANDS		**Marks**
High	good understanding including 8 or more points	**4–5**
Medium	some understanding and 4–7 points	**2–3**
Low	little understanding, has mentioned 1–3 points	**1**

(For full marks must include both advantages and disadvantages) **[5]**

6 (a) Planning meals
climate / time of year – e.g. hot meals in cold weather –
equipment available – e.g. may need freezer for dessert / special baking tins –
vary colour – e.g. not mince and potatoes followed by chocolate dessert –
vary flavour – e.g. not fish with lemon sauce followed by lemon meringue pie –
vary texture – e.g. avoid pastry in two courses / do not repeat cooking methods –
meals should be attractive – e.g. use garnishes / decorations / colourful vegetables –
cost – e.g. use LBV protein / eggs / cheap cuts of meat –
season – e.g. use fruit and vegetables in season when they are cheaper –
availability of food – e.g. use left–overs / garden produce / local produce / shops –
skill of cook – e.g. may not know how to make choux pastry –
time available – e.g. may need to use quick methods / convenience foods –
likes and dislikes – e.g. avoid food / flavours not enjoyed –
health – e.g. low fat / low sugar / low salt –
allergies – e.g. nuts / lactose / gluten –
ages of people taking meal – e.g. old may need easily digested food –
activity / occupation – e.g. manual workers may need greater quantity of food –
occasion – e.g. birthday party / packed meal / Christmas lunch / breakfast / supper etc. –
consider whole meal – e.g. not an elaborate first course then simple dessert –
number to serve – e.g. quantity required to have enough food / to avoid waste –
religion – e.g. Hindus do not eat beef / Jews do not eat pork –
vegetarians – e.g. varied food requirements of vegans, lacto-vegetarians, etc. –
gender – e.g. females require additional iron / men need more calories –
3 points **3 × 1 mark**
3 explained examples **3 × 1 mark**

[6]

(b) Meals for teenage girls

HBV protein	growth spurt / production of hormo
iron	menstruation / increased volume of
Vitamin C	absorption of iron;
calcium	bone growth;
Vitamin D	absorption of calcium;
starch / fat	energy;
Vitamin B	release energy from carbohydrates

do not credit nutrient without function

(c) Saving fuel when cooking meals

use microwave oven – less time – less fuel –
steam foods – low heat – several dishes at once –
frying / grilling are quick methods –
use only the oven for whole meal – several dishes at once –
batch bake – can use some and freeze some – saves fuel later –
use only the hob for meal – no need to heat oven –
reduce size of flame – wastes fuel if flames reach up sides of pan –
use pressure cooker – several items at once – cooks quicker – use a slow cooker –
lids on pans – reduces heat loss –
do not overcook food –
cut potatoes into smaller pieces – less cooking time – less fuel –
do not preheat oven more than 10 minutes – switch off when not in use –
switch off burners when not in use –
switch off electric oven before end of cooking – use residual heat –
cook only the amount of food required – to avoid reheating –
have flat-based pans – to have good contact between hotplate and pan –
boil only amount of water needed for tea –
choose materials which are good conductors of heat for pans – cast iron / copper –
match size of pan to size of hotplate – use divided pans
use convenience foods –
use tender cuts of meat – tenderise meat before cooking –
don't cook separate meals for everyone in the house –

MARK BANDS		**Marks**
High	good understanding including 8 or more points	**4–5**
Medium	some understanding and 4–7 points	**2–3**
Low	little understanding, has mentioned 1–3 points	**1**

[5]

7 **(a)** Nutrients in eggs

protein; (or named e.g. ovalbumin / mucin / vitellin) – growth / repair /
energy / hormone production;
fat; energy / insulation / warmth / fat-soluble vitamins / protection of internal organs;
Vitamin A / retinol; visual purple / night vision / mucous membranes / skin / growth;
Vitamin D / cholecalciferol; absorption of calcium / bones and teeth;
Vitamin B2 / riboflavin (or Vitamin B); release of energy from nutrients;
iron; haemoglobin / transport of oxygen / cell respiration / prevent anaemia;
phosphorus; bones and teeth;

3 nutrients **3 × 1 mark**
3 functions **3 × 1 mark**

[6]

(b) Storage of eggs
cool place / refrigerator (keeps longer);
not too dry (water will evaporate through shell);
in egg box / crate / special rack in fridge door (less easily bro
do not store past expiry date (not safe to eat);
do not freeze whole eggs (liquid inside shell expands and cra
freeze only if separated (add sugar or salt to egg whites);
do not wash shells (removes protective cuticle so bacteria ca
round end upwards / air space at top (to hold yolk in place);
check for cracked eggs (bacteria enter so egg is contaminate
use in rotation (to prevent waste);
keep away from strong smells / onion / fish (absorb smell through pores in shell);

3 × 1 mark [3]

(c) Uses of eggs with examples

main dish / breakfast / snack;	omelette, boiled, scrambled, poached egg;
trapping air / making mixtures rise;	Swiss roll, sponge flan;
lightening;	mousse, meringue, soufflé;
thickening;	custard, sauces, soup etc.;
setting;	quiche, rich cakes, baked egg custard;
emulsifying;	mayonnaise, rich cakes etc.;
binding;	croquettes, fish cakes, stuffing, rich pastry;
coating;	Scotch eggs, fish fillets;
glazing;	pastry, bread;
enriching;	sauces, milk pudding, soup;
garnishing;	sliced hard-boiled egg on salad;
adding colour;	pastry, cakes;

2 uses **2 × 1 mark**
2 examples **2 × 1 mark [4]**

(d) Changes when an egg is boiled
egg white thickens / changes from transparent to opaque;
protein coagulates / sets / solidifies / hardens;
becomes rubbery / indigestible if overcooked;
yolk thickens;
yolk becomes powdery when overheated;
green ring forms around yolk (iron / sulphur reaction);

2 × 1 mark [2]

[Section B Total: 45 marks]

8 (a) Most accidents in the home occur in the kitchen. Discuss for this and ways of prevention.

The answer may contain the following knowledge and inform

Knives

store out of the reach of children –
store in sheath or knife block or with cork on point –
keep separate from other cutlery –
keep well sharpened – blunt knives can slip and cause injury
use on a chopping board – do not cut on palm of hand –
cut away from the body –
use size and knife appropriate to task –
carry with blade pointing down towards the floor –
wash individually – do not put into washing up water with other cutlery –
wash with back of knife towards hand (also dry this way) –

Deep frying

pan not more than half full – prevent overflowing when food is added –
dry food before adding to fat – water turns to steam – spits –
dry utensils – wooden handles on pans / utensils – poor conductor of heat –
prevents burning hands –
pan should have a flat base – does not wobble on hotplate –
do not overfill pan with food – may overflow –
do not overheat fat – may ignite – have lid nearby – cover if ignites –
prevents oxygen reaching flames – do not move pan if on fire –
no water nearby – e.g. kettle – water may splash into fat –
causes spitting – do not leave unattended – do not allow children to fry –
make sure dangers are understood – turn off heat after use –
do not move pan until fat is cold – monitor temperature of oil –
use electric deep fat pan – temperature thermostatically controlled –

Electrical equipment

plugs should be wired correctly – if not do not use – use a professional to do it –
do not attempt to wire unless sure of method – no bare wires –
do not use near flames – will melt covering and expose wires –
do not stretch / put strain on wire during use –
keep appliances to back of bench – out of reach of children –
do not leave flexes hanging where they could be tripped over –
use of coiled flexed prevents trailing wires –
use correct fuse for appliance –
plug should not be broken e.g. no screws missing –
do not touch with wet hands –
switch off appliance at socket before removing plug –
do not overload socket by using adapters –
follow manufacturer's instructions –
do not put motor near water when washing up –
wipe with damp cloth when unplugged –
keep hands / fingers away from blades when using –
and when washing up – safer to use a brush to clean blades –

Other points

pan handles turned in – use pan guard –
steam from kettle pointing towards wall –
oven gloves to remove items from oven / hold pan handles et
keep face away from pan / tilt lid away from worker when rem
sleeves rolled up / ties tucked in / no loose clothing –
hair tied back / covered – in case they become tangled with e
avoid high heels / open sandals / slippers –
wipe up spills immediately –
no loose mats / torn lino / broken floor tiles in kitchen – cause
keep floor area clear – do not have highly polished floor– non slip floors –
keep cleaning materials away from food – not in empty food containers – label –
make sure tops cannot be removed by children –
do not place other liquids in empty soft drink bottles –
do not store heavy items on high shelves –
avoid stacking equipment where it could fall –
do not store items used frequently where they cannot be reached easily –
use kitchen stool or chair to reach high cupboards / shelves –
do not hang tea towels near cooker –
no curtains near cooker –
do not run –
know exactly what you are doing at all times – read / understand instructions –
no tablecloths hanging – small children can pull them down –
well lit kitchen –
take care when using pressure cooker –
take care in kitchen at all times / keep focused –
use correct equipment for job e.g. don't use a knife to open a can –
well planned kitchen layout to avoid excess movement –
switch off cooker / appliances when finished –
do not use metal in a microwave –
service electrical appliances regularly –
keep cupboard doors / ovens closed –
arrange oven shelves before heating to prevent burning hands –

		Band	Descriptor	Part mark	Total
8	**(a)**	High	Can identify many causes of accidents Suggests ways to avoid accidents Is able to identify and discuss several areas where accidents occur Gives examples to illustrate points made Answers are detailed where appropriate Understanding of the topic is apparent Information is specific Information is usually accurate All areas of the question addressed Some specific facts included and the topic is addressed in its widest application	**11–15**	**15**
		Middle	Some causes of accidents identified May give some advice on avoiding accidents Is able to identify a few areas where accidents occur Some discussions or explanations given Gives a few examples to illustrate points made	**6–10**	

Shows a basic understanding of the topic
Information is basic but generally accurate
Not all areas of the question addressed
Gaps in knowledge will be apparent
May be few specific facts
Answers will be detailed in parts and superficial in ot
Overall lack of detail
Some inaccurate information
Information is not always precise
Has a sound knowledge of some aspects

Low — May give a few causes of accidents — **0–5**
Little information on avoiding accidents
Mentions some areas where accidents occur
May give examples to illustrate
Answer tends to be a list of statements
Information is general
Answer will probably be brief
Not always accurate
Emphasis is on one aspect of question
Lack of knowledge will be apparent

(b) The kitchen should be a well-planned area in which to work. Discuss:

(i) different ways of arranging the cooking area;

(ii) the choice of kitchen surfaces. **[15]**

The answer may contain the following knowledge and information.

(i) Arranging the cooking area
has to accommodate sink – cooker – refrigerator – storage space –
work surfaces –
equipment should be in a logical order – ergonomic – work triangle –
to form a continuous working area – to suit sequence of working –
food storage → preparation → cooking → serving → clearing up –
arrangement should not waste time – and energy –
moving about from one area to another –
excessive bending and stretching avoided – in order to use equipment –
U-shaped – L-shaped – galley / parallel lines plan / island –
(can show on diagrams)
work surfaces on either side of cooker – sink – and refrigerator –
cupboards / refrigerator etc. under work surface –
space to put dishes from oven – or dishes after being washed –
or space to prepare dishes near cooker –

(ii) Kitchen surfaces
worktops needed on either side of sink – and hob –
to give a continuous work surface – avoid carrying hot pans –
sinks and hobs can be fitted into worktops – for smooth flow of surface –
should be at a comfortable height for working – to avoid stretching –
or stooping – should be no gaps between surface and equipment –
behind sink – or where work surface meets walls –

which would trap food – and attract bacteria – contamina
can be made of plastic / Formica covering chipboard / wo
marble – granite – stainless steel – wood – ceramic tiles
smooth – hard-wearing – easy to clean – heat-resistant –
stain-resistant – resistant to household cleaning agents –
often made with a rolled edge – more comfortable to lean
less likely to chip – colour to suit décor of kitchen –
protect surface from damage – avoid burning plastic / sc
walls must be easy to clean – withstand moisture / conde
avoid gloss paint to reduce condensation – cool colour –
plastic / vinyl coated wallpapers – attractive – easy to change –
floor should not be slippery – not damaged by water – easy to clean –
clay tiles – linoleum – no loose mats – danger of tripping –
wash surfaces with hot, soapy water – to remove food and grease –
and prevent attracting insects etc. – sugar attracts ants –
remove food which could stain quickly – e.g. curry sauce –

(b) Band	Descriptor	Part mark	Total
High	Can identify at least 2 ways of arranging kitchen May illustrate with diagrams Identifies processes taking place in kitchen Knows that time and energy are saved Gives examples to illustrate points made Answers are detailed where appropriate Considers materials for most kitchen surfaces Gives advantages of materials chosen Understanding of the topic is apparent Information is specific Information is usually accurate All areas of the question addressed Some specific facts included and the topic is addressed in its widest application	**11–15**	**15**
Middle	Can identify at least 1 way of arranging kitchen May illustrate with diagrams May identify processes taking place in kitchen Possibly mentions saving time and energy Considers some materials for kitchen surfaces Little further information May give examples to illustrate points made Shows a basic understanding of the topic Information is basic but generally accurate Not all areas of the question addressed equally Gaps in knowledge will be apparent May be few specific facts Answers will be detailed in parts and superficial in others Overall lack of detail Some inaccurate information Information is not always precise Has a sound knowledge of some aspects	**6–10**	

Low
May give ways of arranging kitchen
Possibly shows by diagrams
May not mention processes taking place in kitchen
May not mention saving time and energy
May list suitable materials for surfaces
Probably gives no advantages or disadvantages
Few examples to illustrate points made
Answer tends to be a list of statements
Information is general
Answer will probably be brief
Not always accurate
Emphasis is on one aspect of question
Lack of knowledge will be apparent

[Section C Total: 15]

[Total for Paper: 100]