UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2008 question paper

6065 FOOD AND NUTRITION

6065/01 Paper 1 (Written), maximum raw mark 100

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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UNIVERSITY of CAMBRIDGE
International Examinations

Section A

1 (a) Balanced diet
contains all nutrients (1 mark)
in correct proportion/amount (1 mark) [2]

(b) (i) carbon – hydrogen – oxygen – nitrogen – phosphorus – sulphur (4 × 1 point) [2]
(2 points = 1 mark)

(ii) Functions of protein
growth/body building
repair
maintenance
energy
enzymes/hormones/antibodies (4 × 1 mark) [4]

(iii) HBV protein
Contains **all** essential amino acid/indispensable amino acids [1]

(iv) meat – fish – cheese – milk – eggs – soya (4 × 1 point) (2 points = 1 mark) [2]

(v) LBV protein
Lacks at least **one** essential amino acid/indispensable amino acid
or **one** EAA/IAA is found in poor supply [1]

(vi) cereals – pulses – nuts (or 1 named example from group) (2 × 1 point)
(2 points = 1 mark) [1]

(vii) Digestion and absorption of protein
in stomach – rennin – clots milk – HCl – pepsin – from gastric juice
converts proteins to peptones/peptides/polypeptides –
in duodenum – trypsin – from pancreatic juice –
converts proteins to peptones/peptides/polypeptides –
in ileum – erepsin – from intestinal juice –
converts peptides to amino acids –
absorbed into blood capillaries – in villi –
(10 × 1 point – at least 1 point on absorption) (2 points = 1 mark) [5]

(c) (i) Functions of calcium
formation/maintenance of bones/teeth
muscle function
function of nerves
blood clotting (3 × 1 mark) [3]

(ii) milk – cheese – bones of canned fish e.g. salmon – bread – yoghurt
hard water – green vegetables (or named example) – wholegrain cereals
(4 × 1 point) (2 points = 1 mark) [2]

(iii) Rickets OR Osteomalacia [1]

(iv) Symptoms
RICKETS
weak bones – bones bend under weight of body – bow legs –
knock knees – ends of limb bones become enlarged – skull fragile
OSTEOMALACIA
brittle bones – bones easily broken
(4 × 1 point) (2 points = 1 mark) [2]

(v) Vitamin D [1]

(vi) liver – fish liver oils (or named e.g.) – oily fish (or named e.g.) – yoghurt
eggs – margarine – milk – cheese – butter – red meat – sunlight –
(4 × 1 point) (2 points = 1 mark) [2]

(d) (i) Saturated fat
excess fat is stored – under skin – adipose layer –
around internal organs – obesity – contains cholesterol –
deposited on artery walls – narrows – blocks – CHD – stroke –
breathlessness – hypertension etc.
(6 × 1 point) (2 points = 1 mark) [3]

(ii) Ways to reduce fat
less red meat – e.g. beef/pork/lamb – trim fat from meat –
do not fry foods – grilling allows excess fat to drip off –
reduce chocolate/sweets etc. – fewer cakes/biscuits/pastries –
reduce fat in recipes – choose low fat products e.g. yoghurt/cheese –
spread butter thinly – use low fat spreads – fewer crisps/nuts –
cut chips thicker – less surface area in contact with fat –
do not add butter to vegetables – skimmed milk etc.
(4 × 1 point) (2 points = 1 mark) [2]

(e) Special nutritional needs of young children
protein – growth
calcium – bones/teeth
vitamin D – to absorb calcium
iron – formation of red blood cells
vitamin C – absorption of iron
fluoride – teeth
starch – energy
some fat – concentrated source of energy – less bulky
avoid sugar – tooth decay
(12 points) (2 points = 1 mark) [6]

[Section A Total: 40 marks]

Section B

2 (a) Reasons for serving sauces

add moisture	–	gravy, custard etc.
add nutrients	–	custard, chocolate sauce, cheese sauce etc.
add colour	–	jam sauce, chocolate sauce, parsley sauce etc.
add flavour	–	cheese sauce, mint sauce, apple sauce etc.
counteract richness	–	apple sauce with roast pork, orange sauce with duck etc.
add interest/variety	–	curry sauce etc.
add contrasting texture	–	bread sauce with roast poultry, parsley sauce with fried fish etc.

reason (4 × 1 point) examples (4 × 1 point) (2 points = 1 mark) [4]

(b) melt fat – add flour – stir – with wooden spoon –
broader base/does not conduct heat – fits corners of pan –
over gentle heat – until sandy/crumbly – do not allow to brown –
prevent burning of fat/flour – spoiling colour – and flavour –
remove from heat – add milk – gradually – prevent lumps –
flour does not gelatinise – stir all the time – smooth liquid –
return to heat – bring to boil – stir all the time – boil for 3 minutes –
to cook starch – to prevent floury/raw flavour – thickens –
starch gelatinises – should coat the back of wooden spoon –
add cheese off heat – stir until melted
(8 points) (2 points = 1 mark) [4]

(c) Dishes which include cheese sauce

macaroni cheese	lasagne
cauliflower cheese	pasta bake
eggs/fish au gratin	
etc.	

[1]

(d) Reasons for lumps in sauce
milk added too quickly
milk added on heat
too much milk added at a time
not stirred when milk added
not stirred when boiling (3 × 1 mark) [3]

(e) Ways to reduce fat in cheese sauce
reduce margarine/use low fat spread
use semi-skimmed/skimmed milk
use less cheese
choose cheese with a stronger flavour and use less
use low fat cheese etc. (3 × 1 mark) [3]

3 (a) Importance of cereals

cheap
easy to store
versatile
starch/carbohydrate
lasts a long time
many varieties
staple food
readily available
etc.
easy to grow
easy to transport
used for sweet and savoury dishes
used for energy
easy to process
filling
source of LBV protein

(6 points) (2 points = 1 mark) [3]

(b) wheat – barley – oats – rye – rice –
maize/corn/mealie meal – millet – sorghum
(4 points) (2 points = 1 mark) [2]

(c) Storage of cereals

cool – dry – to prevent mould –
check regularly – can be attacked by weevils –
covered containers – prevent entry of dust etc. –
sealed – keep out moisture etc. –
keep cereal bins off ground – prevent attack by rats etc. –
use in rotation – do not mix old and new supplies –
whole grain cereals do not keep long – fat becomes rancid – etc.
(8 points) (2 points = 1 mark) [4]

(d) Types of flour

PLAIN
white – 72–73% extraction – no raising agent – 7–10% protein – fine particles
<u>Uses</u>
sauces – batters – shortcrust pastry – biscuits – shortbread – very rich cakes

SELF-RAISING
70–72% extraction – soft/weak flour – low protein/gluten content –
winter wheat –
fixed quantity of raising agent added
<u>Uses</u>
cakes, scones

STRONG
plain – spring wheat – more than 10% protein/gluten forms
and elastic dough
<u>Uses</u>
bread, yeast mixtures, flaky pastry, puff pastry

WHOLEMEAL
100% extraction – light brown colour – nutty flavour –
due to presence of bran/germ – stone ground –
or roller milled – shorter shelf life – fat in germ becomes rancid
heavy/close-textured product – germ and bran reduce rise
<u>Uses</u>
bread, pastry, scones

BROWN FLOUR
80–85% extraction – no coarse bran particles – better rise –
may be mixed with white flour
Uses
bread, pastry, scones

WHEATGERM
70% extraction – added treated wheat germ – rich in B vitamins –
must contain at least 10% germ – germ cooked with salt –
to prevent fat and enzymes spoiling quality –
Uses
bread

CORNFLOUR
from maize – 100% starch
Uses
thickens
3 named flour types (3 × 1 point) 6 facts (6 × 1 point) 3 examples (3 × 1 point)
(12 points) (2 points = 1 mark) [6]

4 (a) Conserving vitamin C

wash before cutting	–	so vitamin C does not leech from cut cells
tear instead of cutting	–	tear follows cell walls and does not damage
do not shred thinly	–	less cell damage
use a sharp knife	–	to prevent bruising cells
prepare just before cooking	–	vitamin C destroyed by enzymes from cell walls and by oxidation
do not soak	–	vitamin C is water soluble
small amount of water	–	vitamin C is water soluble
boil water first	–	enzyme/ascorbase denatured at 70°C
add veg. in small amounts	–	so temperature stays above 70°C
lid on pan	–	prevents oxidation
do not overcook	–	vitamin C destroyed by heat
use cooking liquid in sauces	–	contains dissolved vitamins
do not add bicarbonate of soda	–	alkaline, so destroys vitamin C (acid)
serve immediately	–	heat/oxidation destroys vitamin C

(10 points) (2 points = 1 mark) [5]

(b) Different uses of sugar in cooking

sweetener	–	drinks, sauces, desserts, cakes
increases energy value	–	beverages etc.
preservative	–	high concentration of sugar prevents growth of micro-organisms in jam
improves colour of baked goods	–	cakes with brown sugar sugar caramelises in dry heat of oven
retains moisture/ prevents baked products drying	–	rich cakes
helps fat to incorporate air	–	creamed cake mixtures
prevents development of gluten/ gives a crumbly result	–	cakes and rich pastries
food for yeast	–	fermentation of bread dough
delays coagulation of protein in eggs and gluten	–	more time for gases to expand

strengthens protein in beaten egg white/helps to retain air – meringues
retards enzyme action – frozen foods
cake icing / decorating – marzipan, royal icing, butter cream etc.
glaze – sugar and water glaze gives sticky layer on yeast buns etc.
caramel – desserts e.g. crème caramel, crème brulee,
confectionery – toffee, sweets, fudge etc.
(10 points) (2 points = 1 mark) [5]

(c) Food Labelling

give information to consumer – some information is a legal requirement
name of product – so consumer knows what is being bought
description – further details e.g. tuna in brine
brand – reliability, knows what to expect etc.
name of manufacture – recognise a s something seen before
address / 'phone / website of manufacturer – in case of need to contact
ingredients – descending order – by weight
may have allergies etc.
cooking instructions – for best result
storage instruction – to maintain best condition
serving suggestion – to give ideas to consumer
picture of product – to give information on new products
weight – can calculate unit cost/make comparisons
special claims – reduced fat/no added sugar/added vitamin C etc.
vegetarian society symbol – so vegetarians know food is suitable
wheat ear symbol – gluten free/coeliacs can consume
recycle symbol – consumer knows how to dispose
nutritional information – consumer knows nutritional value per 100g
kilocalorie content – may be calorie counting, trying to lose weight etc.
sugar – useful for diabetics
fat – states amount of saturated fat –
– may have CHD – or wish to follow a healthier diet
salt – control salt intake if suffering from hypertension
additives identified – may wish to avoid/allergies etc.
price – if on special offer/can compare with other products
etc.
(10 points) (2 points = 1 mark) [5]

5 (a) Reasons for preserving

enjoy food out of season
to cope with a glut
to prevent waste
to give variety – food can be frozen, dried
new products made – jam, pickles etc.
to have a store of food
useful in emergencies etc.
food lasts longer
prevents spoilage
easier to transport
(4 points) (2 points = 1 mark) [2]

(b) (i) Rules for freezing

vegetables should be blanched	–	to destroy enzymes/prevent ripening etc.
air should be removed form package	–	to prevent 'freezer burn'/drying of surface
open freeze soft fruit/berries/peas	–	can take the amount required from pack
allow head space for liquids	–	liquids expand when frozen
use oldest stocks first	–	food still spoils but not as quickly
follow storage times as directed	–	some foods e.g. with fat deteriorate quicker
set freezer at 'fast freeze' 2–3 hours before use	–	to prevent formation of large ice crystals/ damage to cell wall/loss of liquid
do not freeze too much food at once	–	to allow temperature to remain low enough

cool before freezing
cover/seal/wrap to prevent air entry/evaporation of moisture
etc.
4 rules (4 × 1 point) 4 explanations (4 × 1 point) (8 points) (2 points = 1 mark) [4]

(ii) Storage temperature

–18°C [1]

(iii) Reasons why freezing delays food spoilage

bacteria are dormant (2 points) (if stated that bacteria are sleeping/resting – 1 point)
bacteria cannot multiply
water frozen therefore unavailable
temperature too low
bacteria need warmth – and moisture to multiply
(6 points) (2 points = 1 mark) [3]

(iv) Information on frozen food label

name of food – date frozen – weight – number of portions –
special points e.g. added sugar – 'best before' date (consult chart) etc.
(4 points) (2 points = 1 mark) [2]

(v) Types of packaging

waterproof – strong so will not tear/be easily damaged –
square shapes are easier to stack – less waste of space
tightly-fitting lids – containers must be airtight
polythene bags – Tupperware boxes – ice cream cartons – tin foil –
waxed cartons for soup – will not absorb liquids –
thin polythene/cling film/greaseproof paper to separate slices of meat etc.
can separate for quicker defrosting –
greaseproof paper/foil to protect sharp bones – avoid damage to plastic bag –
metal coated ties/plastic clips to seal bags – prevent opening/entry of air –
moisture proof tape etc.
(6 points) (2 points =1 mark) [3]

[Section B Total: 45 marks)

Section C

6 **(a)** Saving money

buy fruit and vegetables in season
make use of special offers in shops
buy store's own brand
have a fixed amount of money to spend
shop in markets instead of supermarkets
avoid food that has been prepared
only buy enough for the purpose
cheaper cuts of meat
buy food reduced at end of day
carbohydrate foods are filling – and cheap
use garden/wild produce
save 'money off' coupons
make a shopping list
use cash instead of credit
buy in bulk/larger packages
convenience foods can be expensive
consider left over foods at home
use LBV protein foods

(10 points) (2 points=1 mark) [5]

(b) Saving time

make use of electrical equipment – mixer/blender etc.
microwave oven pressure cooker
frying, stir frying and grilling are quick methods
make use of convenience foods – e.g. frozen puff pastry
prepare and cook food in bulk – freeze some – saves time another day
make stews and casseroles – require little attention – fewer pans to wash
do not peel vegetables e.g. carrots, potatoes – scrub to remove soil
cook and serve in same dish – saves washing up
do not overcook food – cook when required – no time spent on re-heating
one stage method of making rich cakes
cut potatoes etc. into smaller pieces – cook quicker
lids on pans – cook quicker etc.

(10 points) (2 points=1 mark) [5]

(c) Saving fuel

use steamer – several layers share one hot plate
pressure cooker – cooks quicker so less fuel
cut food into smaller pieces – cooks quicker
lid on pan – retain heat – cooks faster
small amount of water in kettle/pan – only heat what is needed
do not overcook – cook when needed so no need to reheat
microwave oven – faster – less fuel
size of pan should fit hot plate – to avoid wasting fuel around base of pan
gas flames should not come around base of pan – heat is wasted
cook the whole meal in the oven or on top of the stove –
batch bake to use all oven shelves – cook several different items at once
preheat for no more than 10 minutes
turn off heat before cooking finished – use residual heat etc.

(10 points) (2 points=1 mark) [5]

7 (a) Importance of raising agents

introduces gas – or substances from which gases evolve – during preparation –
gas expands – on heating – mixture rises –
makes mixtures light – open texture –
easier to digest – more attractive – etc.
(4 points) (2 points = 1 mark) [2]

(b) Air as a raising agent

sieving	–	flour for shortcrust pastry, scones etc.
creaming	–	fat and sugar for rich cakes
rubbing in	–	fat and flour for shortcrust pastry
whisking egg white	–	meringue, soufflé
whisking eggs and sugar	–	Swiss roll , sponge cake
beating	–	eggs before adding to creamed mixtures
rolling and folding	–	flaky pastry, puff pastry etc.

5 methods (5 × 1 point) 5 examples (5 × 1 mark)
(10 points) (2 points = 1 mark) [5]

(c) Rules when making bread with yeast

soft dough	–	so gas can push up the mixture
knead thoroughly	–	develop gluten
rise in warm place	–	encourage fermentation
knead for second time	–	break large bubbles of gas oxygen to encourage yeast growth
shape before proving	–	or gas will be lost
prove in a warm place	–	replace carbon dioxide lost during kneading
leave until double size	–	open texture to loaf/if overproved may collapse
bake in a hot oven	–	to kill yeast/stop fermentation/stop rising

5 rules (5 x 1 point)
5 explanations (5 x 1 point)
(10 points) (2 points = 1 mark) [5]

(d) Baking powder

<u>Composition</u>
bicarbonate of soda – alkali – cream of tartar – acid – gives a tasteless –
colourless residue – with moist – heat – contains a starch filler – to absorb moisture –
will give off a fixed amount of gas – suitable for general use –
and prevent substances reacting
<u>Uses</u>
in creamed cake mixtures, scones, suet pastry etc.
<u>Storage</u>
in an airtight container – dampness encourages a reaction between components –
carbon dioxide would be given off – resulting in a poor reaction when used in mixtures
(6 points – at least 1 point from each area) (2 points = 1 mark) [3]

[Section B Total: 60 marks]