UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

6065 FOOD AND NUTRITION

6065/01 Paper 1 (Practical), 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.

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UNIVERSITY of CAMBRIDGE
International Examinations

Section A

1 (a) (i) Elements in fats and oils
carbon – hydrogen – oxygen
3 × 1 mark [3]

(ii) Functions of fat
energy
stores energy for later use
warmth
insulation
protects internal organs
formation of cell membrane
stores fat-soluble vitamins (or named Vitamins A and D)
provides essential fatty acids
makes food more palatable
increases energy value of food without adding bulk
gives a feeling of fullness after a meal
adds flavour
provides texture
any 5 correct points at 1 mark each [5]

(iii) Saturated fats
contain all the hydrogen they can hold
molecule composed of single bonds/no double bonds (can show on a diagram)
solid
3 × 1 mark [3]

e.g. butter, lard, dripping, suet, dairy cream, coconut oil etc.
2 points 2 points = 1 mark [1]

(iv) Polyunsaturated fats
can accept more hydrogen/do not contain maximum number of hydrogen atoms
more than one double bond in the molecule (can show on diagram)
liquid/found as oils
3 × 1 mark [3]

e.g. corn oil, soya oil, sunflower oil, groundnut oil, sesame oil, olive oil
some fish oils e.g. mackerel
2 points 2 points = 1 mark [1]

(v) Problems associated with a diet high in saturated fats
contains cholesterol
sticks to artery walls/arterial plaque
narrows them
blocks arteries
restricts blood flow
can lead to CHD
high blood pressure, varicose veins, haemorrhoids, angina, strokes (max. 2)

Cholesterol 1 mark
6 other facts = 6 points 2 points = 1 mark [4]

(vi) Digestion and absorption of fat in small intestine
in duodenum – fats are emulsified – by bile – from the liver – stored in gall bladder – breaks fats into small droplets – to give a greater surface area – lipase – from pancreatic juice – converts fats to glycerol – and fatty acids – lipase – intestinal juice – fatty acid – glycerol
in ileum – fats are absorbed into lacteal – in villi – recombine to form fats – mix with lymphatic fluid – then join blood circulatory system – as insoluble fats
10 points (at least 2 on absorption)
2 points = 1 mark [5]

(b) (i) Functions of calcium
building of bones and/or teeth
maintenance of bones/teeth
clotting of blood
functioning of muscles
functioning of nerves
3 × 1 mark [3]

(ii) Sources of calcium
milk – cheese – bread (fortified) – bones of canned fish – hard water – green vegetables
2 points 2 points = 1 mark [1]

(iii) Vitamin D
1 mark [1]

(iv) rickets – osteomalacia – osteoporosis
1 mark [1]

(c) Importance of iron
forms haemoglobin – red pigment in blood – picks up oxygen – forms oxyhaemoglobin – transports oxygen around the body/to cells – oxidises glucose – to produce energy
deficiency causes anaemia – gives a pale colour – causes tiredness/lethargy – headaches – dizziness
8 points 2 points = 1 mark [4]

(d) Meals for convalescents and those recovering from surgery

follow doctor's advice	may need to avoid certain foods etc
protein	repairing/body-building
low-fat diet	difficult to digest fat
low energy	not as active
iron	to replace blood lost
vitamin C	to absorb iron
calcium after fractures	repair damaged bone
vitamin D	to absorb calcium
small, frequent meals	easier to digest/breaks monotony

10 points 2 points = 1 mark [5]

[Section A Total: 40]

Section B

2 (a) Shortcrust pastry method with reasons

sift flour	to aerate – to remove lumps
rub in fat	fingertips – coolest part of hand – hands raised to trap air
should look like breadcrumbs	
add cold water	avoid melting fat
mix with a round-bladed knife	keeps everything cool – stiff dough
knead lightly	firm dough – to avoid pressing out air
chill	allow fat to harden – cool trapped air allows gluten to relax – easier to roll
12 points	2 points = 1 mark [6]

(b) Rules for rolling pastry

Do not turn pastry over.
Roll in one direction.
Do not use too much flour for dredging.
Use short, forward strokes.
Avoid pressing down on the pastry.
Do not stretch the pastry.
Lift pastry on rolling pin to turn.
4 points 2 points = 1 mark [2]

(c) Dishes using shortcrust pastry

fruit pies, meat pies, Cornish pasties, quiches, jam tarts, curry puffs etc
4 points (without repetition e.g. only 1 fruit pie)
2 points = 1 mark [2]

(d) Choice of flour and fat

plain flour	air is raising agent
not self-raising flour	contains baking powder air is raising agent in shortcrust pastry
wholemeal/brown flour	adds fibre – fat – colour – flavour vitamin B – calcium
margarine	for colour – flavour
butter	for colour – flavour
lard	good shortness – lacks flavour – and colour
mixture of lard and margarine	combines shortening power with colour and flavour

10 points (names of ingredients or qualities)
2 points = 1 mark [5]

3 (a) (i) Saving money

buy foods in season	cheaper – better quality – good quality food – to last until needed – prevents waste
buy in bulk	economies of scale
do not buy too much at once	may be wasted – may not have suitable storage
grow own fruit and vegetables	cost of seeds only
reduce use of ready-prepared food/ convenience foods	no added labour costs
use cheaper protein food	cheap cuts of meat – use eggs, milk and cheese
use pulses	mix with other LBV protein to give HBV
only cook the amount required	saves waste
have a shopping list	reduces impulse buys
use left-overs	to prevent waste
look for special offers	check 'sell by' dates etc
do not have fixed meal plans	look for bargains
supermarket's own brands are cheaper	can bulk buy and pass savings to customer
use 'money off' coupons	
compare prices between shops for 'best buy'	
compare prices per 100g/unit	to get best value
shop locally	save transport costs etc
10 points	2 points = 1 mark [5]

(ii) Saving fuel

use microwave	less time (less fuel)
use quick methods	e.g. frying/grilling
steam foods	low heat – several dishes at once
use only the oven for meal	several dishes at once
batch bake	can use some and freeze some
use only the hob for meal	no need to heat oven
reduce size of flame	wastes fuel if flames reach up sides of pans
use pressure cooker	quicker – several items at once
use convenience foods	
keep lid on pan	prevents loss of heat
do not overcook food	
cut potatoes into smaller pieces	less cooking time (less fuel)
do not preheat oven too long	switch off burners when not using
cook only the amount of food required	to avoid reheating
turn off electric cookers before end of cooking time	use residual heat
have flat-based pans	to have good contact between hotplate and pan
boil only the amount of water required for tea etc	
choose materials which are good conductors of heat for pans e.g. cast iron, copper etc	
match size of pan base to hotplate size etc	
10 points	2 points = 1 mark [5]

(b) Convenience foods

Advantages:
saves time (quick to prepare)
saves energy (not tiring)
easy to prepare
easy to store
easy to transport
little waste
can be kept for emergencies
consistent result
wide variety available
may have extra nutrients added e.g. vitamin C to dried potato
cook may not have the ability to prepare the product well e.g. puff pastry
easy to use

Disadvantages:
more expensive than fresh
must follow instructions carefully for good results
small servings
nutrients lost during processing not replaced
low in dietary fibre
high in fat
high in sugar
high in salt
artificial colourings and flavourings may be added
use of additives – long-term effects not known etc

10 points covering both areas 2 points = 1 mark [5]

4 (a) (i) Causes of food spoilage
yeast – moulds – bacteria
3 points

(ii) Conditions for growth of micro-organisms
warmth – moisture – food – time – oxygen – pH
3 points
1 mark for each 2 points [3]

(b) Reduce risk of food contamination when:

(i) Shopping
clean shops
no pets
no insects
insect electrocuter
food covered
clean garments/aprons
no nail varnish
no licking fingers
no blowing into bags
use tongs for handling
different equipment for raw and cooked foods
raw and cooked foods stored separately
assistants not handling money and food
gloves/hair nets at meat counters
date stamps on fresh foods

careful choice of fresh foods e.g. meat and fish
beware at market stalls – customers touching – insects – near dust and traffic pollution
staff should have hand-washing facilities – food not near waste etc.
8 points 2 points = 1 mark [4]

(ii) Storing food

store perishables e.g. meat, fish, milk in refrigerator – temperature 1°C – 5°C – slows bacterial growth
use food in rotation – observe date stamps – do not mix old and new foods e.g. milk
store raw meat at bottom of refrigerator – so liquid does not drip onto food below
do not overpack refrigerator – must allow air to circulate – to maintain temperature – check regularly
cool left-overs rapidly – use within 24 hours – or freeze – prevent bacterial growth –
do not keep food warm – bacteria multiply quickly at around 37°C
store food in clean containers – cover – dry food in airtight containers – prevent moisture causing moulds
check dry goods regularly – for weevils – clean shelves regularly – check for cockroaches – store food away from open windows and bins – avoids flies etc – clean storage area regularly – check for inedible food, crumbs, spills etc
check dents, 'blown' cans etc.
8 points 2 points = 1 mark [4]

(iii) Preparing and cooking food

frozen food must be thawed before cooking – Salmonella in poultry, eggs etc –
food must reach 70°C in centre for 2 minutes – to kill bacteria – use different equipment for raw and cooked food – thaw thoroughly
wash up in very hot soapy water – to remove grease and to kill bacteria – use clean tea towels or drain utensils – reduce risk of introducing bacteria to clean utensils
wipe up spills and crumbs – to avoid attracting insects – clean surfaces
do not use dish clothes for floor
get rid of waste quickly – wrap up – pour away liquids – waste bin outside kitchen – so vermin/mosquitoes are not attracted
wear clean overall – short nails – so bacteria not passed to food
no coughing or smoking near food – bacteria transferred to food
no pets in food preparation area – carry fleas etc. on bodies – keep animals' dishes separate from those for the family – bacteria from animals to humans
sick people should not cook – bacteria passed via food to others
bleach dish cloths – boil frequently – to sterilise – use disposable cloths – avoid spreading bacteria
cover cuts with waterproof plaster – avoid passing bacteria via food
don't leave food uncovered – flies bring diseases etc

N.B. Avoid repetition. Do not allow 'to prevent contamination' (in question).
Only allow 'cross-contamination' once if relevant in the answer.
8 point 2 points = 1 mark [4]

5 (a) (i) Nutrients in milk

protein – fat – calcium – phosphorus – vitamin A/retinol – vitamin D/cholecalciferol – vitamin B1/thiamine – riboflavin/B2 – carbohydrate/sugar
vitamin B (allow once if specific examples not given)
8 points 2 points = 1 mark [4]

(ii) Advice, with reasons, on storage of milk

keep in a cool place/refrigerate	bacteria reproduce more slowly
store in clean containers	so bacteria in container cannot contaminate milk
do not mix old and new milk	if older milk is beginning to sour, will affect new milk
cover	prevent dust, insects
do not store near strong-smelling foods e.g. cheese, onions	milk becomes tainted; it absorbs the smell
store in a dark place/away from sunlight	riboflavin destroyed by exposure to sunlight
use within two or three days	souring begins
store and use UHT as fresh if opened	exposed to bacteria from air
dried milk in airtight containers	to prevent absorption of moisture
when reconstituted, use and store as fresh milk	suitable food for bacterial growth

6 points 2 points = 1 mark [3]

(iii) (a) souring of milk

lactic acid bacteria – act on lactose – changing it to lactic acid – curdles – sour flavour
4 points 2 points = 1 mark

(b) milk boils over

protein coagulates on heating – forms a skin – water in milk turns to steam – cannot evaporate – builds up under skin – pushes up skin – boils over when skin reaches top of pan
4 points 2 points = 1 mark [4]

(b) (i) Pasteurisation

either milk heated to not less than 72°C (162°F) – for at least 15 seconds
or milk heated to 63°C (145°F) – for 30 minutes
cooled rapidly – to discourage growth of remaining bacteria
bottled as soon as possible
harmful bacteria (causing Tuberculosis) destroyed
flavour not affected (4 points)

(ii) UHT

heated at 132°C – for 1 second
rapidly cooled – packed into foil-lined containers – sealed
does not affect colour – or nutritional value
kills harmful bacteria – kills souring bacteria (4 points)
8 points 2 points = 1 mark [4]

6 (a) Reasons for cooking food

to give hot food in cold weather – e.g. soup
to improve attractiveness/colour – e.g. to change red haemoglobin to brown
smell stimulates appetite – e.g. curry
makes food digestible by cooking starch – e.g. potatoes
reduces bulk so that more nutrients can be absorbed – e.g. cabbage
adds variety – e.g. cakes and casseroles
makes food safe to eat/kills bacteria – e.g. milk and chicken
destroys toxins – red kidney beans must be boiled for 15 mins
prevents spoilage – meat etc
tenderises – e.g. meat improves flavour – e.g. roast meat
necessary for some processes – e.g. thickening sauces
improves flavour – e.g. meat extractives, toast, fried food etc
easier to eat – meat etc
creates new dishes – cakes, casseroles etc
10 points – 5 reasons + 5 examples 2 points = 1 mark [5]

(b) <u>Herbs and spices</u>

herbs – edible grasses, leaves
e.g. parsley, sage, thyme, rosemary, tarragon, coriander, mint, chives
(1 point for each pair) – allow no more than 2 points (4 e.g.)
spices – from root, stem, flower or seed, bark
e.g. nutmeg, cinnamon, cloves, ginger, mace, pepper, mustard
(1 point for each pair) – allow no more than 2 points (4 e.g.)
can be use dried or fresh
store dried herbs in dark places – to preserve colour
e.g. of use – fish in parsley sauce, sage in stuffing, mint sauce with roast lamb
e.g. of use – gingerbread, mustard in cheese sauce, pepper in soup
(not more than 2 examples of use of each to be credited)
stimulate flow of digestive juices – aids digestion
give colour – flavour – aroma to dishes – use in small amounts
may be used in infusions – herbal teas, tarragon vinegar etc
DO NOT credit medicinal uses
freshly ground spices have a superior flavour
etc
10 points 2 points = 1 mark [5]

(c) <u>Uses of eggs in cookery</u>

as a main dish – omelette, eggs au gratin
snack – egg sandwich, scrambled or poached eggs
thickening – protein coagulates at 60°C – custard, sauces, lemon curd
binding – protein sets, holding ingredients together – stuffings, beefburgers
setting – protein sets and holds filling – quiche
coating – protein sets around food keeping out fat and protecting from heat – Scotch eggs, fried fish
enriching – adds nutrients to a dish – cakes (also adds moisture and shortness)
lightening – traps air – whisked sponge, soufflé
glazing – brown, shiny surface on pastry dishes
garnishing – chopped white and sieved yolk on dressed crab, savoury flan
emulsifying – holds oil and vinegar in suspension – mayonnaise
clearing – whisked egg white folded into consommé
etc
10 points (5 uses + 5 examples) 2 points = 1 mark [5]

7 **(a)** Nutritional value of pulses

LBV – protein – (soya HBV) – fat – carbohydrate/starch – dietary fibre (NSP) – iron – thiamine – nicotinic acid – calcium

6 points 2 points = 1 mark [3]

(b) Examples of pulses

butter beans – haricot beans – mung beans – adzuki beans – borlotti beans – split peas – lentils – soya beans – chick peas – flageolet beans – black-eyed beans – dhal – peanuts/ground nuts

4 points 2 points = 1 mark [2]

(c) Importance of pulses

easily produced
dry so easily stored
cheap to produce
can be mixed with another LBV food – to give HBV protein – complementation
filling
give variety to meals
valuable in vegan diet

4 points 2 points = 1 mark [2]

(d) TVP

Textured Vegetable Protein
made from soya beans – HBV protein
(must give these 2 points – asked in question)
textured and flavoured to resemble meat
shaped into cubes or granules
cheaper alternative to meat
used as a meat substitute – in sausages , pies, curries etc
can be used as an extender by mixing with meat
no waste
low in fat
conforms with dietary guidelines – reduction in saturated fat
useful for vegetarians
iron, thiamine and riboflavin can be added
can be used in canteen meals
used in convenience foods e.g. Pot Noodles
needs little cooking etc

8 points 2 points = 1 mark [5]

(e) Preparing and cooking dried red kidney beans

soak – to take up water lost during drying – to allow them to soften – swell – cook more quickly
boil – for 15 minutes during cooking time – destroys toxins – which occur naturally in kidney beans – prevents food poisoning

6 points 2 points = 1 mark [3]

[Section B Total: 60]