

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

**MARK SCHEME for the October/November 2010 question paper
for the guidance of teachers**

6065 FOOD AND NUTRITION

6065/01

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.

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- 1 (a) (i) Elements in fat
carbon – hydrogen – oxygen
3 × 1 mark [3]
- (ii) Functions of fat
energy
energy reserve
protects vital organs
insulates / preserves body heat / warmth
solvent for fat soluble vitamins / ADEK
increases calorific value of food without adding bulk
provides texture to food
gives flavour to food
gives a feeling of fullness (satiety) after a meal
slows down digestion
formation of cell membranes etc.
3 × 1 mark [3]
- (iii) Saturated fat
contains maximum amount of hydrogen
molecule has only single bonds / no double bonds
(may show on a diagram)
solid (at room temperature)
usually from animals
contains cholesterol
3 points
e.g. butter – lard – dripping – suet – cocoa butter – coconut oil – palm oil
1 point [2]
- Monounsaturated fat
molecule can accept more hydrogen
molecule has **one** double bond
(may show on diagram)
liquid (at room temperature)
plant origin
3 points
e.g. olive oil – avocado oil, rapeseed oil/canola
1 point [2]
- Polyunsaturated fat
molecule can accept more hydrogen
molecule has **more than one** double bond
(may show on diagram)
liquid (at room temperature)
usually plant – or fish origin
3 points
e.g. sesame seed oil – sunflower seed oil – maize oil – palm oil – peanut oil – soya bean oil – nut oil (or named e.g.) – oily fish (or named e.g.) – fish liver oil (or named e.g.) – safflower
1 point [2]

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(iv) Digestion and absorption of fat

in duodenum – bile – from liver – stored in gall bladder – emulsifies fat – increases surface area – breaks into small droplets – lipase – from pancreatic juice – converts fat to fatty acid – and glycerol

in ileum – lipase – from intestinal juice – converts fat to fatty acid – and glycerol

in the ileum – finger-like projections – villi – contain lacteal – connected to lymphatic system – absorbs glycerol and fatty acid – recombine to form fats – mix with lymphatic fluid – join blood circulation – as insoluble fat

10 × 1 point

2 points = 1 mark

[5]

(v) Reasons for reducing saturated fat

contains cholesterol – deposited on artery walls – narrows – blocks – may cause CHD / heart attack – hypertension – strokes – excess fat is stored – under skin – as adipose tissue – around internal organs – obesity / weight gain – breathless – problems during surgery – low self-esteem etc.

8 × 1 point

2 points = 1 mark

[4]

(vi) Ways to reduce saturated fat

less red meat / beef / pork / lamb – white meat / fish instead of red meat – trim fat from meat – do not fry foods in lard / butter / dripping – grill instead of fry – use plant oils (or named e.g.) to fry – named food, e.g. bacon, sausages, chops – reduce consumption of chocolate – eat fewer cakes / biscuits / pastries – avoid avocado

reduce butter / margarine in recipes – eat fewer eggs – consume less butter / cheese – choose low-fat products e.g. yoghurt / cheese – use skimmed milk – spread butter thinly – use low-fat spreads – do not add butter to cooked vegetables – etc.

6 × 1 point

2 points = 1 mark

[3]

(b) (i) Importance of Non-Starch Polysaccharide / NSP (dietary fibre)

absorbs water – in colon – making faeces soft – and bulky – and easy to expel – regularly – helps to clear waste – binds food residues – stimulates peristalsis – gives muscles something to grip – prevents constipation – hernias – haemorrhoids – cancer of colon – diverticular disease – varicose veins etc.

helps to remove toxins – reduces cholesterol – gives feeling of fullness etc.

8 points

2 points = 1 mark

[4]

(ii) Sources of NSP

green, leafy vegetables – fruit skins – wholegrain cereals – bran – maize – wholemeal bread – wholemeal pasta – brown rice – pulses – nuts – potato skins – dried fruits – oats – oranges – wholemeal flour – celery – tomato seeds etc.

4 points

2 points = 1 mark

[2]

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(c) Uses of Water

absorbed by NSP – removes waste
 forms part of protoplasm in cells – 70% of body is water
 constituent of body fluids – saliva / blood / digestive juices / lymph
 required in metabolic reactions – all processes take place in solution
 aids absorption – nutrients dissolve in water for easy absorption
 keeps mucous membranes moist – protects body from infection
 lubricates joints – prevents ends of bones damaging each other – knees, elbows
 maintains body temperature / cools body – lost in perspiration
 needed during lactation – for milk production
 maintains water balance – continually being lost – needs replacing – prevents dehydration
 helps to eliminate waste – from kidneys as urine – makes food easier to eat / swallow
 helps to keep faeces soft – prevents constipation etc.

4 uses – 1 point each + 4 pieces of additional information

8 points

2 points = 1 mark

[4]

(d) Good eating habits in children

eat meals with rest of family – do not allow to leave table – cut food if necessary – to encourage independence – small portion – encourage to eat everything – regular mealtimes – should begin day with breakfast – start metabolism – no snacking between meals – will not be hungry for meal – do not use sweets as a reward – or punish by not giving certain foods – serve attractively – variety of colours – variety of flavours – easy to eat – no strong flavours – variety of foods – variety of textures – avoid sweet drinks before meals – spoils appetite – water with meal – include fresh fruit and vegetables
 should include 500mls / 1 pint milk daily – introduce new foods – for wide variety of nutrients – avoid oily foods
 so they will grow up liking different foods – and will not be fussy – may be difficult to digest – encourage to use cutlery properly – avoid overfeeding – risk of obesity in later life etc.

(may illustrate with examples)

12 points

2 points = 1 mark

[6]

[Section A Total = 40]

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2 (a) Points to consider when meal planning

(NB do NOT credit 'balanced' or points on nutrition.)

climate / time of year – hot meals in cold weather – e.g. soup in winter, salads in summer
 equipment available – may need freezer for dessert / baking tins etc.
 vary colour – e.g. not mince and potatoes followed by chocolate dessert / tomato soup then tomatoes in main course
 vary flavour – do not repeat flavours in courses – e.g. fish with lemon sauce followed by lemon meringue pie
 vary texture – avoid pastry in two courses etc.
 variety of cooking methods
 meals should be attractive – use garnishes / decorations
 consider cost – use LBV protein / eggs / cheap cuts of meat
 season – use fruit and vegetables in season – cheaper
 availability of food – use left-overs / garden produce / local produce
 shopping facilities – may need to buy fresh produce daily
 skill of cook – may not know how to make choux pastry etc.
 time available – may need to use quick methods e.g. frying / grilling
 likes and dislikes – avoid food not enjoyed – waste
 special requirements – consider vegetarians / diets etc.
 ages of people taking meal – e.g. old may need easily-digested food – manual workers may need greater quantity of food
 occasion – birthday party / packed meal / Christmas lunch
 consider whole meal – not an elaborate first course then simple dessert
 number to serve – quantity required – to have enough food / to avoid waste
 religion – Hindus do not eat beef / Jews do not eat pork etc.
 gender – females require additional iron etc.

5 points + 5 examples = 10 points

2 points = 1 mark

[5]

(b) Dietary needs of pregnant women

sufficient protein	– growth of (foetus)
calcium and / or phosphorus	– building bones / teeth
vitamin D	– to absorb calcium
iron	– for baby's first six months – prevent anaemia in mother – formation of haemoglobin
vitamin C	– to absorb iron
vitamin A	– for baby's eyesight
NSP	– prevent constipation
reduced fat	– difficult to digest – baby too big – mother overweight
reduced sugar	– less active so less energy used
folate / folic acid	– prevent neural tube defects / spina bifida
12 points	2 points = 1 mark [6]

(c) Problems if sugar content is too high

tooth decay – bacteria change sugar to acids – dissolve enamel
 excess stored as fat – obesity – breathless – low self-esteem – baby overweight
 associated with CHD – varicose veins – hypertension etc. – risk of diabetes – too much glucose in blood for insulin produced

8 points

2 points = 1 mark

[4]

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3 (a) Choice of flour and fat for shortcrust pastry

Flour

not SR flour – has a chemical raising agent

plain – air is raising agent

white – lighter texture – rises more easily

soft – low gluten content – for more crumbly pastry

wholemeal flour – or mix with white flour – adds NSP – iron – rougher texture – produces a heavier result – nutty flavour

Fat

hard fat – does not melt when rubbing in – fat should be cold / chilled – not easily melted before baking – margarine – butter – good colour – and flavour – butter is more expensive – lard – crumbly / short result – because it does not contain water – poor colour – and flavour – mixture of lard and margarine – has qualities of both fats etc.

10 points to cover both ingredients

2 points = 1 mark

[5]

(b) Method of making shortcrust pastry

sieve flour – trap air – remove lumps – impurities

cut fat into small pieces – easier to rub in

rub fat into flour – thumbs over fingertips – coolest part of hand

lift hands high – to incorporate air – keep mixture cool

mixture should look like fine breadcrumbs – add cold water – all at once – measure accurately – mix with round-bladed knife – cool – draw pastry together with fingertips – stiff dough – not sticky – knead lightly – to avoid pressing out air – to form a smooth dough – leave in a cool place before rolling – to allow gluten to relax

12 points

2 points = 1 mark

[6]

(c) Named dishes

meat / fruit pie – Cornish pasties – curry puffs – savoury slice – fruit flan – lemon meringue pie – jam tarts – quiche – sausage rolls – cheese straws etc.

4 points

2 points = 1 mark

[2]

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- (d) (i) Pastry shrinks during baking
 pastry stretched during rolling out
 stretched during shaping / lining flan ring etc.
 not allowed to rest before baking
 2 points

- (ii) Hard, tough pastry
 conditions for making pastry not cool enough
 fat not hard enough
 fat melted during rubbing in
 not enough air incorporated during preparation
 heavy handling / kneading heavily / pressed too much when rolling
 too much kneading developed gluten
 pastry re-rolled too many times
 too much water added to rubbed-in mixture / wrong proportions
 too much flour for rolling out
 pastry turned over during rolling etc.
 2 points

4 points

2 points = 1 mark

[2]

- 4 (a) Reasons for cooking
 to make it safe to eat – bacteria in meat killed by heat
 to destroy toxins – in red kidney beans
 improve appearance
 give hot food in cold weather – soup in winter etc.
 reduces bulk of food – cooked green vegetables etc.
 makes food more digestible – cooked starch digested more readily than raw
 changes colour of food – meat from red to brown / brown crust
 changes texture – egg sets on heating etc. – tenderises meat
 change of flavour – meat extractives developed during cooking
 add variety of foods – eggs can be poached, fried, boiled etc.
 make new products – jam, pickles, condensed milk etc.
 mix together different foods – cakes, sauces, casseroles etc.
 preserves food – milk scalded, fruit made into jam etc.
 smell stimulates digestive juices – curry, fried bacon etc.
 removes excess fat
 develops aroma
 10 points

2 points = 1 mark

[5]

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(b) Advantages and disadvantages of frying**Advantages**

quick method of cooking
 food browns
 deep frying gives even colour to foods
 crisp surface
 flavour developed
 appetising smell
 different types of frying – 2 methods – 1 point
 saut  ing
 dry
 shallow
 deep
 stir-frying
 if foods are coated juices are sealed in – prevents absorption of fat
 coating holds fragile foods in shape – prevents breaking up etc.
 high satiety value

Disadvantages

adds fat to product
 increases calorific value of food
 needs constant attention during cooking
 can be a dangerous process
 can be expensive to buy enough oil for deep fat pan
 cannot cook large amounts at once
 cannot leave unattended
 fried food difficult to digest
 unhealthy method of cooking – linked to CHD / obesity
 can be difficult to judge temperature of fat
 if too hot food will be overcooked on outside – raw inside
 if too cool food will absorb oil – unappetising
 needs skill for successful results
 must strain oil when cool to remove crumbs of food
 decomposing / burnt food gives bitter flavour to fried foods
 burnt crumbs leave dark specks on food

10 points

2 points = 1 mark

[5]

(c) Saving time when preparing and cooking family meals

collect ingredients and equipment required before starting to cook
 read recipe carefully – wastes time constantly referring to books
 use some raw dishes / courses – fruit salad / vegetable salad
 make use of electrical equipment – mixer / blender etc.
 microwave oven – pressure cooker – frying and grilling are quick methods
 make use of convenience foods – e.g. frozen puff pastry
 use soft margarine for creaming – quicker and easier
 tenderise meat before cooking – use tender cuts – less cooking time – 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 cook too much 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]

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5 (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

rolling and folding

– flaky pastry, puff pastry etc.

whipping

– cream

5 methods 5 × 1 point

5 examples 5 × 1 point

10 points

2 points = 1 mark

[5]

(c) Rules to follow 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 over-proved may collapse

bake in a hot oven

– to kill yeast / stop fermentation / stop rising

5 rules + 5 explanations

10 points

2 points = 1 mark

[5]

(d) Baking powder

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

use in creamed cake mixtures, scones, suet pastry etc.

dry – store 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

2 points = 1 mark

[3]

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6 (a) meat is cooked by a moist method

fat melts – meat shrinks – muscle fibres contract – protein denatures
squeeze out extractives – pass into cooking water – flavour gravy – colour changes from red to brown – oxymyoglobin to haemochrome – B vitamins dissolve in cooking liquid – thiamin destroyed by heat – collagen – insoluble – changes to gelatine – soluble – muscle fibres loosen – meat becomes tender – easy to eat / chew – becomes firm – protein coagulates on heating – at 60°C etc.

10 points

2 points = 1 mark

[5]

(b) a loaf of bread is baked

rises – warmth of oven encourages fermentation – carbon dioxide produced
alcohol evaporates – water evaporates – pushes up dough – yeast is killed – no more carbon dioxide produced – gas in dough expands on heating – protein – gluten – coagulates – shape sets – starch dextrinises – gluten stretches
forms crust – browns – crust lifts off / 'oven spring' – framework formed
as carbon dioxide continues to expand after shape has set – air replaces gas which has escaped – open texture – starch gelatinises – Maillard browning – reaction between protein and sugar etc.

10 points

2 points = 1 mark

[5]

(c) Changes taking place when a roux sauce is made

fat melts – flour stirred into fat – fat is absorbed by starch grains – mixed to a paste – gentle heat cooks starch – sandy appearance – liquid added – absorbed by cooked starch – add gradually – to prevent formation of lumps – add liquid off heat – prevent lumps – becomes thin liquid when milk has been added – when heated – starch grains soften – swell – absorb liquid – boil – to cook starch – some starch grains rupture / burst – starch gelatinises – sauce thickens

10 points

2 points = 1 mark

[5]

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7 (a) Choice and care of kitchen surfaces

worktops needed on either side of sink – and hob – to give a continuous work surface – avoid carrying hot pans etc. – 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 – contaminates food – can be made of plastic / Formica covering chipboard / wood – wood – marble – granite – stainless steel – ceramic tiles etc.

smooth – hard-wearing – easy to clean – heat-resistant – stain-resistant – resistant to household cleaning agents – and grease – often made with a rolled edge – more comfortable to lean against – less likely to chip – colour to suit décor of kitchen etc.

use (wooden) chopping board – to protect surface from damage – pan stand – to avoid burning plastic / scorching wood – walls must be easy to clean – withstand moisture / condensation – avoid gloss paint to reduce condensation – plastic / vinyl coated wallpapers – attractive – easy to change – floor should not be slippery – not damaged by water – clay tiles – linoleum – etc.

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 etc.

10 points

2 points = 1 mark

[5]

(b) Choice and care of saucepans

variety of sizes – for different quantities – depending on use – budget – variety of types – omelette – deep fat – frying pan etc. – thick base – will not buckle with heat – flat, ground base – for use with solid fuel or electric stove – to give good contact with solid hot-plate – aluminium – lightweight – dents if dropped – can buckle with strong heat – copper / copper base – conducts heat well – expensive – may need special cleaning – stainless steel – good conductor of heat – hard-wearing – no special cleaning needed – keeps shape – handle firmly attached – prevents accidents – plastic / wooden handle – poor conductor of heat – prevents burns – well-fitting lid – saves fuel – prevents evaporation of water / burning food – non-stick surface – easy to clean – need non-metal utensils – avoid damaging surface – rounded corners between base and sides – prevents food collecting

easier to stir – easier to clean – lip on milk pan – easier to pour – size of base should match size of hot-plate – to prevent waste of fuel – enamel – colourful – patterns may match / brighten kitchen – chips if dropped – gradually loses shiny surface – glass – easy to clean – can see contents – pans should be stable when empty – will not tip over when in use etc.

10 points

2 points = 1 mark

[5]

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(c) Choice and care of electric food mixers

consider amount of use – free-standing mixer takes larger quantities – does not need constant attention – may have additional attachments – whisk for meringues – dough hook for bread etc. – hand mixer must be held throughout use – small quantities – few attachments available – but quick and easy to use – easy to store – free-standing mixer may be difficult to store – may be a problem to get out of storage space – so may not use often – should be space on work surface if it is used often

more robust than hand mixer – but more expensive – consider cost – look at reports in magazines / from other users – guarantee – colour – availability of attachments – e.g. blender – do not immerse in water – do not touch with wet hands – switch off before removing beaters – do not try to mend – professionals have expert knowledge – safer – avoid stretching flex – no frayed wire-covering – replace – wipe body of mixer with damp cloth – beaters in hot soapy water etc.

10 points

2 points = 1 mark

[5]

[Section B Total = 60]