

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

MARK SCHEME for the October/November 2007 question paper

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.

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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Section A

1 (a) Functions of fats

energy
reserve of energy
protects vital organs
insulates/preserves body heat
source of fat soluble vitamins/A D E K
increases calorific value of foods without adding bulk
provides texture to food
provides flavour
gives a feeling of fullness (satiety) after a meal
slows down digestion
formation of cell membranes
4 functions – 1 mark each

[4]

(b) (i) Saturated fat

contains maximum amount of hydrogen
molecule has only single bonds
(may show on a diagram)
solid at room temperature
usually from animals
3 points
e.g. butter, lard, dripping, suet
1 point

[2]

(ii) Monounsaturated fat

molecule can accept more hydrogen
molecule has one double bond
(may show on a diagram)
liquid at room temperature usually from plants
1 point
e.g. olive oil, avocado pear
1 point

[1]

(iii) Polyunsaturated fat

molecule can accept more hydrogen
molecule has more than one double bond
(may show on a diagram)
liquid at room temperature
usually in plant oils
3 points
e.g. sesame seed oil, sunflower oil, maize oil, palm oil, peanut oil, oily fish (or named example), fish-liver oil (or named example) etc.
1 point

[2]

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(c) Digestion and absorption of fat

in duodenum – bile – from gall bladder – in liver – emulsifies fat –
breaks fat into small droplets – increases surface area –
lipase – from pancreatic juice – changes fat to fatty acids –
and glycerol –
in ileum – lipase – from intestinal juice – changes fat to fatty acids –
and glycerol –
in small intestine – villi – contain lacteal –
absorbs fatty acids and glycerol – recombine to form fats –
pass into lymphatic system – then into blood system –
10 points (at least 2 points on absorption)
2 points = 1 mark

[5]

(d) Reasons for reducing the amount of fat in the diet

excess fat is stored – under skin – round internal organs – leading to obesity –
breathlessness –
lethargy – hypertension – strokes – lack of self-esteem –
linked to Coronary Heart Disease (CHD) – cholesterol –
deposited in arteries – narrowing – blocking – cause heart attack –
problems during surgery etc.
6 points
2 points = 1 mark

[3]

(e) Ways to reduce fat in meals

remove visible fat from meat
grill instead of fry
absorb excess fat before serving fried food
cut chips thicker – less surface area in contact with fat
spread butter thinly
reduce consumption of cakes/biscuits
eat less chocolate/potato crisps/nuts etc.
use skimmed milk/semi-skimmed milk
choose reduced fat yoghurt/cream/cheese/mayonnaise etc.
4 points
2 points = 1 mark

[2]

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2 (a) Functions of vitamin A

to make the pigment 'visual purple'
to help vision in dim light
make mucous membranes moist
helps to avoid infections
health of the skin
growth of children/bones and teeth
2 functions – 1 mark each

[2]

(b) Animal sources of vitamin A

milk, cheese, eggs, oily fish, fish liver oil, liver
2 points

Plant sources of vitamin A

carrots, cabbage, watercress, spinach, prunes, apricots, tomatoes
2 points

[2]

(c) Deficiency disease

night blindness/Xerophthalmia
1 mark

[1]

(d) Functions of vitamin D

growth
formation of bones and or teeth
absorption of calcium
2 functions – 1 mark each

[2]

(e) Food sources of vitamin D

liver, fish liver oils, oily fish (salmon, tuna, pilchards, mackerel etc.),
eggs, milk, cheese, margarine (added by law)
3 points

Non-food source

sunlight
1 point

[2]

(f) Deficiency disease

rickets/osteomalacia
1 mark

[1]

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3 (a) Importance of Non-Starch Polysaccharide (NSP)

absorbs water – making waste soft – and bulky –
 easier to pass out of the body – stimulates peristalsis –
 prevents constipation –
 and cancer of colon/diverticular disease/varicose veins/hernia/
 haemorrhoids (allow only **one** of these conditions) –
 helps to reduce cholesterol – removes toxins

6 points

2 points = 1 mark

[3]

(b) Good sources of NSP

green vegetables (or named example) – fruit/vegetable skins –
 celery/rhubarb – baked beans – pulses – wholemeal bread –
 brown rice – wholegrain breakfast cereals – bran – oats etc.

4 points

2 points = 1 mark

[2]

4 Dietary needs of manual workers

carbohydrate

– energy

fat

– concentrated source of energy

carbohydrate foods bulky – difficult to digest

water

– replace water lost in perspiration

salt (NaCl)

– to replace salt lost in perspiration

iron

– carry oxygen – oxidise glucose etc. – produce energy

vitamin C

– absorption of iron

protein

– replace worn out cells

vitamin B

– release energy from carbohydrates, fats, protein

energy-dense snacks pastries, cakes, chocolate etc. –

increase energy intake

– spread meals/snacks throughout day – etc.

NB – Only credit the above nutrients which are of particular need to manual workers.

6 well-explained points – 1 mark each

[6]

[Section A Total: 40 marks]

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Section B

5 (a) Nutrients in eggs

protein – fat – vitamin A – vitamin D – vitamin B/riboflavin – iron

6 points

2 points = 1 mark

[3]

(b) Uses of eggs

main meal	– omelette, scrambled egg, boiled egg etc.
trapping air	– Swiss roll, sponge flan etc. lightening – mousse, meringue, soufflé etc.
thickening	– custard, sauces, soup etc.
setting	– quiche, rich cakes, baked egg custard etc.
emulsifying	– mayonnaise, rich cakes etc.
binding	– croquettes, fish cakes, stuffing etc.
coating	– Scotch eggs, fish fillets etc.
glazing	– pastry, bread etc.
enriching	– sauces, milk puddings, soups etc.
garnishing	– salad, dressed crab etc.

5 uses + examples – 1 mark each

(do not credit example if corresponding use is not given)

[5]

(c) Storage of eggs

cool place/refrigerator – not too dry – water evaporates –
 away from strong smells – smell absorbed through pores in shell –
 do not wash shells – removes protective cuticle on shell –
 round end upwards – air space at top – holds yolk in place –
 freeze only if separated – add sugar or salt to egg whites –

6 points

2 points = 1 mark

[3]

(d) Changes when an egg is boiled

protein coagulates – egg white at 60 C – egg yolk at 70 C –
 egg white thickens – changes from transparent to opaque –
 becomes firm – then rubbery if overcooked –
 yolk thickens – becomes powdery when overheated –
 green ring forms around yolk – ferrous sulphate – iron in yolk –
 sulphur in egg white – indigestible if overcooked

8 points

2 points = 1 mark

[4]

Page 7	Mark Scheme	Syllabus
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6 (a) **Choice of flour and fat for flaky pastry**

- flour** hard/strong – high gluten content – white – plain
brown flour gives heavy pastry – but contains NSP
- fat** hard – margarine – butter – give flavour – and colour –
white vegetable fat – no cholesterol – lard –
mixture of lard and margarine

6 points to cover flour and fat
2 points = 1 mark

[3]

(b) **Method of making flaky pastry**

mix the two fats together – to distribute evenly
divide fat into 4 equal pieces – add in quarters
sieve flour and salt – mix together – aerate
rub in one quarter of fat – evenly distributed
add liquid all at once – knead – to develop gluten –
mix to a soft, elastic dough – can stretch and flake during baking –
roll to a rectangle – 3 x as long as width
mark into thirds – dot 1 quarter of fat onto top two thirds –
fold bottom third up and top third down – to enclose fat –
seal edges – prevent loss of trapped air –
chill pastry for 5 mins. – to harden fat –
give pastry a quarter turn – so pastry is rolled in a different direction –
repeat rolling and folding to add remainder of pastry –
roll and fold once more without fat – to create more layers – seal –
leave to rest for 10 minutes – allow gluten to relax –
(may show some information on a diagram)

Do not credit points on shaping and baking flaky pastry.

14 points (Must include at least 2 reasons)
2 points = 1 mark

[7]

(c) **Dishes using flaky pastry**

cream horns	sausage rolls	Eccles cakes
Cornish pasties	cream slices	fruit turnovers
Russian fish pie	savoury plait	steak and kidney pie etc.

4 points
2 points = 1 mark

[2]

(d) **Pastry has not flaked well**

oven temperature too cool
uneven rolling and folding
uneven addition of fat
not allowed to rest in a cool place

mixture too dry
edges sealed by careless rolling
fat melted during preparation
cooling in a draught

Pastry has risen unevenly

fat unevenly distributed/added unevenly
pastry tilted in oven
6 points covering both faults
2 points = 1 mark

pastry rolled and folded unevenly
not enough time allowed for pastry to relax

[3]

Page 8	Mark Scheme	Syllabus
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7 (a) The choice and care of kitchen knives

Choice

reliable make – may have a guarantee –
 variety of sizes for different purposes – peeling, chopping etc. –
 serrated edge knife useful for slicing fruit and vegetables finely –
 strong handle – comfortable to hold – handle firmly fixed –
 wood, plastic etc. – easy to grip – no cracks/joins for dirt to collect –
 some have blade and handle in one piece of metal – easy to clean –
 sharp – blunt knives slip – rigid blade – does not bend when cutting –
 except palette knives –
 stainless steel – hard wearing –
 large knives not usually stainless unless permanently sharp –
 blade able to be sharpened – for efficient cutting etc.

Care

store with blades pointing downwards – in a knife block –
 or with sheath over blade – or point protected by cork –
 use on a chopping board –
 wash in hot soapy water – dry thoroughly – to prevent rusting –
 do not use to cut frozen meat etc. unless specially for purpose –
 was immediately after cutting lemon – to prevent staining metal etc.
 10 points to cover choice and care
 2 points = 1 mark

[5]

(b) The disposal of kitchen waste

empty bin daily – wash daily – dry thoroughly/in sun –
 do not leave water in bin – attracts mosquitoes –
 line with plastic bin liner – easier to empty – keeps bin cleaner –
 disinfect regularly –
 wrap all waste – tie bags – pour away liquid – wrap broken glass –
 clear up spills and mess around bin – prevents flies/insects –
 cover bin tightly – prevents flies etc.
 rinse and flatten cans – removes smell of food – takes up less space –
 recycle paper, glass, aluminium cans etc. if possible –
 food waste can be put to compost – or fed to animals
 stand outside bin on bricks – allows air to circulate underneath –
 keep outside bin away from house/open windows –
 so flies do not get into house easily – burn waste when convenient –
 do not pour fat down drains – blocks drain when it hardens –
 make sure U-bend contains clean water – disinfect at night –
 leave no scraps lying about on work surfaces or floor –
 encourages vermin
 do not allow bin to overflow – encourages animals/vermin/insects etc.
 10 points
 2 points = 1 mark

[5]

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(c) Hygiene in shops and markets

shop assistants should have clean overalls/aprons –
bacteria from clothing can be transferred to food –
hair tied back from face/covered – prevent hair in food –
clean short fingernails – bacteria thrive in dirt under nails –
no nail varnish – chips and contaminates food –
do not lick fingers when picking up wrapping paper –
bacteria in mouth passes to paper then food –
do not blow into paper bags to open them –
different knives and boards for raw and cooked food –
cross-contamination – should be hand washing facilities in shop –
do not handle food and money – dirt on money passed to food –
sell food in rotation – check dates on packages –
refrigerator and freezer should display temperature –
if not cold enough bacteria will not be inactive in freezer –
food with spoil more quickly in refrigerator –
keep premises free from vermin/flies – carry bacteria –
passes to food – no rubbish lying around shops or stalls – smells –
food in freezer should be wrapped well – do not sell out-of-date food –
number of bacteria will be high – risk of food poisoning etc.

10 points

2 points = 1 mark

[5]

[Section B Total: 45 marks]

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Section C
Answer either 8 (a) or 8 (b)

- 8 (a) Discuss the importance of fruit in the diet and suggest ways of including fruit in family meals.

The answer may include the following knowledge and understanding.

Nutrients in fruit

- | | |
|--------------------|--|
| carbohydrate/sugar | – bananas, grapes, mango, pears etc.
dried figs, dates, sultanas etc. |
| vitamin A | – avocado pear |
| vitamin C | – apricots, mango, melon, peaches etc. |
| nicotinic acid | – oranges, lemons, blackcurrants, grapes, strawberries etc. |
| calcium | – avocado pear, dried apricots, dates figs etc. |
| iron | – blackcurrants, oranges, dried apricots, figs etc.
– avocado pear, dried apricots, dried figs etc. |

Other reasons for including fruit in the diet

- high water content – refreshing –
- quick snack – easy to carry – little or no preparation required –
- good source of NSP – filling if on weight reducing diet –
- for efficient working of digestive tract –
- variety of flavour – variety of colour – make meal more attractive –
- variety of textures – can be eaten raw or cooked –
- many ways of serving – can be preserved at home –
- can be grown at home – cheap when in season – easily available –
- quick to prepare and cook – can enjoy food from other lands –
- canned fruit often cheaper than fresh – e.g. peaches, pineapples –
- can be stored at home – used in emergencies – etc.

Ways of using fruit in family meals

- | | |
|---------------|---|
| as a drink | – orange juice, banana smoothie etc. |
| in ice cream | – strawberry, lemon sorbet etc. |
| hot dessert | – Eve's pudding, pineapple upside down, apple crumble, apple pie etc. |
| cold dessert | – lemon meringue pie, fruit fool, fruit salad |
| scones | – apple, sultans, cherry etc. |
| cakes | – apple, cherry, currants etc. |
| accompaniment | – apple sauce with pork, pineapple with ham |
| packed meals | – banana, apple etc. |
| jam | – marmalade, strawberry jam, lemon curd etc. |
| main dish | – curry, sweet and sour chicken etc. |
| decoration | – lemon wedges, glaze cherries etc. |

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8 (a) Band	Descriptor	Part mark
High	<ul style="list-style-type: none"> – can name several nutrients in fruit – can give some functions of those names – examples to illustrate sources of nutrients – can give several other factors on importance of fruit – gives a range of different uses of fruit in family meals – names dishes which include fruit – understanding of the topic is apparent – information is specific and generally accurate – all areas of the question addressed 	11–15
Middle	<ul style="list-style-type: none"> – can name a few of the nutrients in fruit – a few of the functions noted – some named examples of fruit to illustrate – some others factors about importance – a few different uses of fruit in dishes – many dishes using fruit listed – not always related to uses – some information inaccurate – information is not always precise – has sound knowledge of some aspects – information lacking in detail 	6–10
Low	<ul style="list-style-type: none"> – one or two nutrients mentioned – little reference to functions of nutrients – lists many dishes containing fruit – does not usually relate to use of fruit – information is general – information is brief – not always accurate – emphasis is on one aspect of question – lack of knowledge will be apparent 	0–5

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- 8 (b) Discuss reasons for cooking food and explain different ways of transferring heat in the preparation of dishes.

The answer may include the following knowledge and understanding.

Reasons for cooking food

to kill harmful bacteria/make food safe to eat – e.g. meat
to destroy natural toxins – e.g. red kidney beans
to preserve – e.g. making fruit into jam,
to aid digestion – cooked starch easier to digest – begins in mouth to aid absorption e.g. raw starch in potatoes and flour cannot be easily be absorbed
to make food easier to eat – e.g. meat is tenderised
to make food more attractive – meat changes from red to brown
to develop extractives/flavour – grilled steak, toasted cheese
smell stimulates appetite/flow of digestive juices – e.g. curry
to provide hot food in cold weather – e.g. soup in winter
to reduce bulk/allow more to be eaten – e.g. cabbage
create new dishes – e.g. quiche, chocolate cake etc.
add variety to diet – e.g. eggs can be cooked in many different ways
necessary for some cooking processes – e.g. thickening sauces, baking cakes and biscuits

Methods of transferring heat

conduction – through solids – by contact –
also occurs within food in microwave cooking –
molecules vibrate rapidly – adjoining molecules vibrate etc. e.g. metal spoon in hot liquid, pan standing on a hotplate etc.
convection – through liquids – and gases –
molecules rise when heated – colder molecules fall –
convection currents created etc. e.g. boiling water in pan, heated oven etc.
radiation – no medium – through space or vacuum –
rays from source of heat – fall on food in their path –
food needs to be turned etc. e.g. grill, barbecue
in microwave oven – electromagnetic waves given off – by radiation –
cause a rise in temperature in the object in path of waves –
heat transferred within food by conduction etc.

(If microwaves mentioned, should be in context of conduction and radiation.)

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8 (b) Band	Descriptor	Part mark
High	<ul style="list-style-type: none"> – can name several reasons for cooking – can give named examples to illustrate reasons – correctly named methods of heat transfer – is able to give scientific explanations of methods – can give suitable dishes for most of methods named – gives examples of methods of heat transfer – understanding of the topic is apparent – information is specific and generally accurate – all areas of the question addressed 	11–15
Middle	<ul style="list-style-type: none"> – can name a few reasons for cooking – a few named examples to illustrate reasons – some named methods of heat transfer – some scientific explanations may be given – some examples of dishes for methods named – some information inaccurate – information is not always precise – has sound knowledge of some aspects – information lacking in detail 	6–10
Low	<ul style="list-style-type: none"> – one or two reasons for cooking mentioned – little reference examples relating to reasons – mentions methods of heat transfer – little scientific knowledge to explain methods – information is general – information is brief – not always accurate – emphasis is on one aspect of question – lack of knowledge will be apparent 	0–5

[Section C Total: 15 marks]