UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the November 2004 question paper

0648 FOOD AND NUTRITION

0648/01 **Paper 1 (Theory), maximum mark 100**

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

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Grade thresholds taken for Syllabus 0648 (Food and Nutrition) in the November 2004 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 1	100	75	60	40	30

The threshold (minimum mark) for B is set halfway between those for Grades A and C.
The threshold (minimum mark) for D is set halfway between those for Grades C and E.
The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.
Grade A* does not exist at the level of an individual component.

November 2004

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 100

SYLLABUS/COMPONENT: 0648/01

FOOD AND NUTRITION
(Theory)

UNIVERSITY of CAMBRIDGE
International Examinations

Section A

1 **(a)** growth maintenance/repair energy
production of secretions/hormones/enzymes/antibodies
any 3 x 1 mark **[3]**

(b) carbon - hydrogen - oxygen - nitrogen
4 points 2 points = 1 mark **[2]**

(c) **(i)** HBV protein
contain all indispensable amino-acids - in adequate amounts
1 well-explained point - 1 mark **[1]**

(ii) meat - fish - eggs - milk - cheese – soya/TVP
4 points 2 points = 1 mark **[2]**

(d) **(i)** LBV protein
lacks - at least one - essential amino-acid
1 well-explained point - 1 mark **[1]**

(ii) cereals - pulses - nuts - gelatine (max 2 examples of any)
4 points 2 points = 1 mark **[2]**

(e) **(i)** Complementary proteins
2 protein foods - eaten together
deficiency in indispensable amino-acid in one - made up by the other
2 well-explained points - 2 marks **[2]**

(ii) beans on toast - lentil soup and bread - etc.
2 examples - 1 mark **[1]**

(f) Digestion and absorption of protein
in the stomach - rennin - clots milk – pepsin/gastric juice - in presence of acid (HC*l*) - converts protein to peptones/peptides/polypeptides - enterokinase – converts trypsinogen to trypsin
in the duodenum - trypsin - from pancreatic juice - converts protein to peptones/peptides/polypeptides
in the ileum - erepsin - from intestinal juice - converts peptones to amino-acids - amino-acids absorbed in villi - into blood capillaries
(must be at least 2 points on absorption)
12 points 2 points = 1 mark **[6]**

(g) Deamination
nitrogen/ammonia removed - in liver - toxic - excreted as urea/in urine - via kidneys
4 points 2 points = 1 mark **[2]**

2 **(a)** NSP in the body
helps in excretion
absorbs water - makes faeces soft - and bulky - easier to eliminate - encourages peristalsis - gives feeling of fullness - removes toxins - prevents constipation - diverticular disease - cancer of colon - hernia - haemorrhoids -
lowers cholesterol (max 2)
8 points 2 points = 1 mark **[4]**

(b) whole grain cereals - brown rice - whole-wheat flour - whole-wheat bread - green vegetables - celery - rhubarb - fruit skins - tomato seeds - dried fruit - oats - plums - pulses - bananas

(allow fruit and vegetables once if no examples given)

4 examples - 2 marks **[2]**

3 **(a)** Water balance - replaces salt lost - in sweat/blood etc. - to replace water lost 1 mark

for body fluids - blood, sweat, tears etc. 1 mark

chloride forms part of HC*l* - in gastric juice

flavour - in savoury dishes 1 mark **[3]**

(b) hot climates - water lost to cool body

heavy manual work - water lost in perspiration

exercise/sports - fever - water lost to cool body 2 x 1 mark **[2]**

(c) muscle cramps 1 mark **[1]**

(d) less bacon, salted fish, cheese, etc. - salt added to preserve or in manufacture

less processed food - convenience foods, stock cubes, dried soup etc.

replace with potassium chloride - similar flavour but no sodium

use when cooking food or when serving - not both

use other flavourings - herbs, spices etc.

less soya sauce/MSG

fewer salty snacks - nuts, crisps etc.

soak ham before cooking or bring to boil - salt dissolves in water, can be discarded

choose unsalted versions of foods - such as butter etc.

6 well-explained points **[6]**

[TOTAL for Section A: 45]

Section B

4 **(a)** <u>Nutrients in red meat</u>

protein - fat - iron - vitamin A - vitamin D - thiamine - riboflavin - nicotinic acid - cobalamin (B_{12}) - (or allow vitamin B once)

6 points 2 points = 1 mark **[3]**

(b) <u>Tenderising meat before cooking</u>

beating - mincing or cutting into small pieces - hanging - scoring

soak/marinade - in acid (wine/vinegar/lemon juice) -

use of enzymes - papain (papaya) bromalin (pineapple)

(Do not allow 'use of tenderising powders' or 'meat tenderiser')

4 named methods x 1 point 2 points = 1 mark **[2]**

(c) **(i)** <u>Moist methods of cooking</u>

braising - boiling - stewing - pressure cooking

2 methods - 1 mark **[1]**

(ii) <u>Changes during cooking</u>

insoluble - collagen - changes to gelatine - which is soluble -

fibres fall apart - fat melts - colour changes from red to brown - shrinks

extractives squeezed out - protein coagulates -

8 points 2 points = 1 mark **[4]**

(d) **(i)** Reasons to reduce red meat

narrows arteries - cholesterol deposited in artery walls
contains saturated fat - high in cholesterol - blocks arteries -
can lead to coronary heart disease - high blood pressure - strokes
can cause obesity/weight gain - can result in breathlessness etc.

6 points 2 points = 1 mark **[3]**

(ii) Alternatives to red meat

white meat (or named e.g. - chicken, turkey) - fish - soya beans - TVP - pulses (or 1 named example) - cereals - nuts - mention of protein complementation or mixing LBV protein or eating a variety of LBV proteins - eggs - milk - cheese

4 points 2 points = 1 mark **[2]**

5 **(a)**

Sieve (dry ingredients/flour)	-	before folding in flour in creamed mixtures etc.
rub fat into flour	-	plain cakes, shortcrust pastry, scones etc.
creaming fat and sugar	-	Victoria sandwich cake etc.
beating	-	adding egg into creamed mixtures etc. 1 stage cake making
rolling and folding	-	flaky and rough puff pastry
{ whisking egg whites	-	meringues, souffles etc.
{ whisking whole eggs and sugar	-	Swiss roll, sponge flan etc.

5 x 1 mark for method + example **[5]**

(b) Scones

sieve dry ingredients - aerate, mix dry ingredients together, remove lumps
rub in fat - break into small pieces, to mix thoroughly with dry ingredients, fingertips - coolest part
stir in sugar and other dry ingredients - to mix evenly
add liquid/milk - mix with round-bladed knife - cold - keeps in air - soft but not sticky dough
draw together gently - with fingertips - pressure knocks out air
knead lightly - to avoid developing gluten - gives a tough result
form into round shape - less waste when cutting round shapes
press or roll gently - until 1½-2 cm thick
work on lightly-floured board - to prevent sticking, to avoid altering proportions
cut into shapes - same size and thickness - for even baking
brush with egg/milk for savoury scones or water and sugar for sweet scones - to give a brown, shiny surface/a brown, crispy surface
bake at 225°C/450°F or gas mark 8 - for 8-10 minutes - not much fat so quick cooking needed to prevent drying - grease tray, hot oven, preheat oven
hot oven causes carbon dioxide to be produced quickly - to raise scones
when well-risen, set and golden brown - remove onto cooling tray

12 points 2 points = 1 mark **[6]**

(c) Variations

cheese - sugar - dried fruit - (or currants, raisins or sultanas) - walnuts - glace cherries - herbs (or named example) - potatoes

2 examples (avoid repetition e.g. not 2 dried fruit) 1 mark **[1]**

(d) **(i)** Carbon dioxide 1 mark **[1]**

(ii) **(a)** produced by the action of moist heat - on baking powder

(b) gases expand on heating - pushing up mixture -
leaves a colourless and tasteless residue -
heat of oven sets risen shape - protein coagulates

4 points to cover **(i)** and **(ii)** 2 points = 1 mark 2 marks **[2]**

6 **(a)** **(i)** Causes of food spoilage
yeasts - moulds - bacteria - enzyme action
4 points 2 points = 1 mark **[2]**

(ii) Conditions
warmth - moisture - food - time - oxygen - correct pH
4 points 2 points = 1 mark **[2]**

(b) **(i)** low temperature -18°C stops growth of bacteria
water unavailable
4 points 2 points = 1 mark **[2]**

(ii) fast freezing -25°C small ice-crystals form within cell walls
do not rupture cell walls contents do not escape from cells when thawed
4 points 2 points = 1 mark **[2]**

(c) **(i)** 4°C (1-7°C) 1 mark **[1]**

(ii) **(a)** too high - warm enough to allow bacteria to multiply more quickly -
food will not keep for so long

(b) too low - water in eggs, green vegetables etc. will freeze -
texture of food will be damaged
2 points = 1 mark **[1]**

(iii) Rules for using a refrigerator
use food in rotation - prevents waste
wipe milk bottles - to prevent dirt from outside being brought in
keep raw and cooked food separate - prevent cross-contamination
raw meat at bottom - prevent juices dripping onto cooked food
temperature must be approx. 4°C - to slow down growth of micro-organisms
do not put hot food into refrigerator - increases temperature inside
throw away old food - could be dangerous to eat
cover strongly smelling food - to prevent tainting other food
use clean containers - free from bacteria from other food
clean regularly - to ensure free from bacteria
keep door closed
box for get at bottom
cover or wrap food - to prevent drying out
do not overcrowd - to allow cold air to circulate etc.
5 well-explained points **[5]**

[TOTAL for Section B: 45]

7 (a) Reasons for cooking

to make it safe by destroying bacteria
to make it more attractive by developing colour
to make it more palatable by developing flavour
to tenderise so that it is easier to eat
to make it more digestible by cooking starch etc.
to preserve by destroying micro-organisms and denaturing enzymes
to provide variety in the diet by combining flavours etc.
to provide hot food in cold weather
to combine ingredients to make new dishes etc.

Saving money when buying food

importance of planning meals - buy correct quantities
make a shopping list - do not buy unnecessary foods
shop around for best value for different foods
use special offers/loss leaders
fresh foods usually cheaper than processed foods
know how to recognise fresh products - meat, fish, fruit, vegetables etc.
buy food in season - cheaper price and best quality
buy local foods - no transport costs included
buy sufficient to preserve when in season - use when expensive
buy in bulk/large pack - if storage is available
do not buy more than can be stored - will deteriorate, may have to throw away
prepare the exact amounts needed - or make use of left-overs
look for reduced goods at end of day/at end of 'sell by' date - if they can be used
do not have a rigid idea of meals for the day - make use of bargains etc.

Cooking food

peel fruit and vegetables very thinly
use left-over foods in rechauffe dishes e.g. Shepherd's Pie
use raw fruit and vegetables where appropriate
use all shelves when baking/cooking a meal
cook entire meal in oven or on hob
use fuel-saving equipment - steamer, slow cooker, pressure cooker, microwave oven
cook extra portions to freeze for later
do not overcook foods
flames not too high - not up sides of pan
base of pan to fit hotplate - no heat wasted at base of pan
minimum water when boiling vegetables or in kettle
lid on pan - loss of heat, loss of water by evaporation etc.

30 points to include facts, explanations and examples
At least 4 points from each area - reasons for cooking, buying and cooking food
2 points = 1 mark **[15]**

7 (b) Information on label

name of food - so correct food is bought
product description - may not be obvious from name
ingredients list - in descending order of weight - may wish to avoid ingredient
additives - by name or number - so those with allergies - or hypertension can avoid
cooking instructions - so product can be served at its best
storage instructions - to maintain best quality
legal advice - may contain nuts etc.
'sell by' or 'use by' dates - so product is safe to eat
weight/number in package - so unit price can be calculated, to buy the amount needed
brand name - may want to buy from a well-known range
name and address of manufacturer - in case of complaint
country of origin - may wish to avoid produce from particular areas
picture of product
bar code - pricing, stock control etc.

Nutritional Information

gives nutritional content per 100g - and per serving
helps to plan balanced diet
may have added vitamin C - calcium
may state daily requirements of particular nutrients
shows what proportion of daily amount is supplied by each serving
states amount of fat - useful for low fat diet
states how much of fat is saturated - for those with CHD or for prevention
quantity of sodium - low salt for those with hypertension
protein from vegetable sources - for vegetarians - if 'V' shown on label
kcal/kJ per 100g or per portion - for those counting calories

weight reducing diet	- may wish to reduce intake of fat and sugar can use kcal. information to calculate daily intake etc.
vegetarians	-will not wish to include animal fat in their diet will be able to check the type of fat in the product
those on a low cholesterol diet	-will wish to check the amount of saturated fat will wish to control quantity of fat in product etc.

30 points to include facts, explanations and examples
2 points = 1 mark **[15]**

[TOTAL for Section C: 15]

[Total for Paper: 100]