

CONFIDENTIAL
November 2002

INTERNATIONAL GCSE

MARKING SCHEME

MAXIMUM MARK : 100

SYLLABUS/COMPONENT : 0635/01

FOOD SCIENCE
Theory

IMPORTANT NOTICE

Marking schemes have been issued on the basis of ONE copy per Assistant Examiner and TWO copies per Team Leader.



Provisional Marking Scheme**Section A**

- | | | | | |
|----|-----------------|---|-------|-----|
| 1. | Christmas | Christmas cake, mince pies, chocolate log, roast turkey | | |
| | Thanksgiving | Roast turkey, chestnuts, pumpkin pie | | |
| | Easter | Hot cross buns | | |
| | Shrove Tuesday | Pancakes | | |
| | Jewish New Year | | | |
| | Wedding | wedding cake | | |
| | Ramadan | etc. | | |
| | | Festival + named dish - 1 mark | x 2 | [2] |
| 2. | (a) | weather
failure of previous crops - lack of seed
type of land
lack of money for fertilisers and equipment | etc. | |
| | | | 2 x 1 | [2] |
| | (b) | cheaper
used when freshly picked
highest nutritive value (or examples)
may have been grown without pesticides / organic
best quality - deteriorate quickly | etc. | |
| | | | 2 x 1 | [2] |
| 3. | (a) | base of pan same size as hotplate
no flames up sides of pan
turn down heat to maintain temperature
do not tilt lid to let steam escape
use a lid on pan
pressure cooker
steamer
divided pans
boil eggs and potatoes together, peas and carrots etc. | | |
| | | | 2 x 1 | |
| | (b) | whole meal in oven
batch bake
do not preheat for too long
make use of residual heat
use all shelves at same time etc. | | |
| | | | 2 x 1 | [4] |
| 4. | (a) | parsley or lemon garnish, serve with colourful vegetables e.g peas, carrots | | |
| | (b) | parsley sauce, cheese sauce, lemon wedges, | | |
| | (c) | crunchy vegetables, baked or roast potatoes etc. | | |
| | | | 3 x 1 | [3] |

5. (a) (i)(a) glucose, galactose, fructose 3 points
(b) maltose, lactose, sucrose 3 points
2 points for 1 mark [3]
- (ii)(a) pectin, cellulose 2 points [1]
(b) cannot be digested / cannot be broken down
nutrients cannot be absorbed
1 well-explained point [1]
- (b) (i) mouth, duodenum, ileum any 2 points
(allow small intestine once if others not given)
(ii) salivary amylase (ptyalin) - (cooked) starch to maltose
pancreatic amylase - starch to maltose
maltase - maltose to glucose
6 points for 3 marks [4]
6. (a) Raw meat contains bacteria - destroyed by cooking
If stored together, bacteria will reinfect cooked food
2 well-explained points [2]
- (b) white flour is almost pure starch - brown flour contains fat
fat becomes rancid - effect of time, oxygen etc.
2 well-explained points [2]
7. (a) **biscuits**
airtight tin, sealed polythene bag, tinfoil etc. any 1
absorb moisture from surroundings - become soft 1 mark
- ~~(b)~~ **root vegetables**
dark, cool, dry place, wrapped in newspaper 2 points - 1 mark
dampness causes moulding
warmth causes sprouting
paper covering to prevent drying out / withering any 1
- ~~(b)~~ ~~(c)~~ **milk**
cool place, refrigerator, in water - covered with cloth dipping into water
any 1
bacterial growth slowed down at cold temperatures 1 mark [6] 4.
8. (a)(i) **Shortcrust pastry** **Victoria sandwich cake** **Swiss roll**
125 g (fat) 150 g (flour) 50g (sugar)
40 ml (water) 150 g (sugar) 50 g (flour)
150 g (fat)

(i)	Shortcrust pastry	plain flour	margarine + lard	
	Victoria sandwich cake	SR flour	margarine or butter	caster sugar
	Swiss roll	plain flour	caster sugar	

14 points - 7 marks [7]

(b)	Shortcrust pastry	gas mark 7 or 425 F or 210°C		
	Victoria sandwich cake	gas mark 4 or 350 C or 180°C		
	Swiss roll	gas mark 6 or 400 C or 200°C		[3]

Section B

9. (a)(i) carbon - hydrogen - oxygen - nitrogen 4 points - 2 marks
(ii) amino-acids 1 mark [3]

- (b)(i) HBV protein contains all essential amino-acids in good supply 1 mark
LBV protein lacks at least one essential amino acid 1 mark
(ii)(a) HBV - meat - fish - eggs - milk - cheese - soya any 2 -1 mark
(b) LBV - cereals - peas - beans - lentils - nuts any 2 -1 mark [4]

- (c)(i) growth
repair / maintenance
body secretions e.g. hormones, enzymes, antibodies
energy any 3

(ii) age - growth
health - repair following injury or surgery
pregnancy or lactation - protein for foetus or baby
sex - male body mass greater than female
occupation - muscle growth for manual workers any 4 [7]

- (d)(i) pepsin - in stomach - proteins to peptones
rennin - clots milk
duodenum - trypsin - pancreatic juice - proteins to peptones
ileum - erepsin - intestinal juice - peptones to amino acids

(ii) nitrogen removed - in liver - excreted from kidneys - as urine
12 points covering both areas - 6 marks [6]

10. (a)(i) cool place / refrigerator - slow down bacterial growth
away from strongly-smelling food - absorbed through porous shell
pointed end down - to keep yolk in centre
do not wash - removes protective covering on shell
not too dry a place - water evaporates
do not store if shell is broken - bacteria will enter
3 well-explained points

- (ii) prominent rounded yolk - thick white nearest yolk - very little thin white - does not spread much
2 points - 1 mark [4]
- (b)(i) Souffle - omelette - quiche - Scotch eggs etc
2 examples - 1 mark [1]
- (ii) add nutrients - HBV protein - iron - fat - Vits A - D - B group etc.
give shape - protein coagulates on heating
trap air - make mixtures rise when baked
bind ingredients - protein sets - prevents food breaking up
Any 3 well-explained points - 1 mark each [3]
- (c)(i) **glazing** e.g. bread, pastry, biscuits 1 example - 1 point
beaten whole egg / egg yolk brushed onto surface - before baking
egg white brushed onto surface - sprinkled with sugar min. 1 point
protein coagulates with heat - shiny surface
further heating denatures protein - turns brown max. 4 points [3]
- (ii) **coating** e.g. fish. Scotch eggs, fritters - before frying 2 points
used with breadcrumbs - to prevent breaking - absorption of fat -
protect food from heat of fat - prevent burning -
protein coagulates on heating - sets shape - forms seal - fat cannot penetrate -
fat must be hot enough - to allow protein to coagulate immediately
any 4 points [3]
- (iii) **raising agent** e.g. whisked sponge, Swiss roll, sponge flan - 1 point
whisked with sugar - to form a stable foam - very small air bubbles -
trapped in egg white - air expands - protein coagulates on heating -
risen shape set - must not be any fat present (on equipment or as egg yolk) -
prevents egg white from holding the yolk
any 5 points [3]
- (iv) **emulsifier** e.g. mayonnaise, creamed cake mixtures 1 point
yolk contains lecithin - enables oil and water to combine - without separating -
oil must be added slowly - mixed thoroughly - use electric blender - thickens -
any 5 points [3]
11. (a)(i) cost
space available
capacity required
size of family
storage arrangements inside refrigerator
style features - colour, workmanship,
additional features - automatic defrost, frozen food compartment etc.
any 2 [2]
- (ii) cheaper to buy food in bulk
freeze foods in season
garden produce available throughout year
prevents waste
less need to shop
food available for emergencies - visitors, illness
special occasions (parties) can be prepared in advance etc.
any 2 [2]

- (b)(i) (a) bacteria need warmth to multiply
temperature in refrigerator will slow down growth
but will still cause food to deteriorate
- (b) too low for bacteria to multiply
water frozen so not available
remain dormant
will begin to multiply when conditions are favourable
4 points covering both parts - 2 marks [2]
- (ii) liquid inside cell walls freezes into many very small crystals -
do not rupture cell wall -
when defrosted will retain shape -
juices will not escape - texture will not be spoilt -
higher temperature, water forms one large ice crystal -
bigger than space inside cell -
cell wall breaks - juice lost on thawing - mushy texture.
2 well-explained points [2]
- (c)(i) (a) food containing bacteria is stored beside food without bacteria
e.g. raw meat is placed beside fresh meat -
bacteria pass from one food to another
food not covered in refrigerator - bacteria pass from one food to another
raw meat not on bottom shelf - blood drips onto cooked food etc.
1 well-explained point
- (b) food not covered **or** covering not airtight **or** air not properly removed from
pack - surface dries out - white patches - irreversible
1 well-explained point
- (ii) (a) cover foods in refrigerator
raw meat at bottom
do not pack foods closely together
use foods in rotation
check use-by dates etc.
throw away suspect food
wipe up spills
clean and defrost regularly etc. any 2 points - 1 mark
- (b) remove all air from packages
use good quality polythene bags
pad meat bones to prevent tearing bags
twist and fold tops of bags before securing
do not 'open freeze' meat etc. any 2 points - 1 mark [4]
- (d) poultry may contain salmonella bacteria
if ice in centre when put to cook, temperature will only melt ice
inside will not be cooked (raw) when outside is cooked
meat will not be thoroughly cooked right through
will be warm, moist and a source of food poisoning
temperature at centre will not reach 70 C
ideal conditions for bacterial growth
bacteria will infect cooked meat
3 well-explained points or 6 facts [3]

- (e)(i) blanching denatures enzymes
enzymes are protein - denatured by heat (above 70°C)
deterioration of vegetables will be halted
colour, flavour and texture and nutritive value will be retained
at least 1 well-explained point
- (ii) prepare vegetables according to kind
quantity suitable for one meal
place in metal basket and immerse in boiling water
follow instructions regarding timing for particular vegetable
remove and place in iced water to cool temp. of vegetables quickly
drain thoroughly
pack in airtight containers
'fast freeze' max. 8 method points - 4 marks [5]
12. (a)(i) flour - margarine 2 points - 1 mark [1]
- (ii) melt fat - stir in flour - cook over a gentle heat - until 'sandy'
(or other description) 4 points - 2 marks [2]
- (iii) remove from heat - gradually add milk - stirring well between each addition -
return to heat - bring to boil - stirring all the time - with a wooden spoon -
boil for 3 minutes - until sauce thickens
6 points - 3 marks [3]
- (b)(i) use double amount of margarine and flour
to make coating sauce instead of pouring sauce
grate cheese finely
make sauce by usual method
add cheese to finished sauce
stir well to melt cheese
do not heat sauce to melt cheese
- (ii) add sugar to sweeten sauce - 1 level tablesp.? 15g?
add flavouring of choice e.g. cocoa, orange
add cocoa with flour because cocoa needs to be cooked
if drinking chocolate, do not add sugar
- (iii) reduce quantity of fat
use low-fat spread
remove fat and make blended sauce
use skimmed milk or semi-skimmed milk
any 12 points (at least 2 from each area) - 6 marks [6]
- (c) starch grains - soften - absorb water - heated - swell - burst -
6 points - 3 marks [3]
- (d)(i) blending - egg custard - mayonnaise - puree - jam or syrup
4 types - 2 marks

- (ii) to add flavour to dull dishes - steamed fish and parsley sauce
 to add nutritive value - eggs, milk
 counteract richness - apple sauce with pork
 improve appearance - tomato sauce with meat
 add moisture - custard with apple pie
 to add interest and variety - cheese sauce with pasta
 3 reasons + example or further information - 3 marks [5]

Section C

13. Types of bread - e.g. French bread, bread rolls, loaves, sliced bread, brown, whole-wheat, etc. (max 6 examples) - 3 marks max.[3]
- Importance - cheap
 easily available
 filling
 energy food
 versatile
- Nut. Val. starch - energy
 calcium - bones and teeth
 thiamine - release of energy from carbohydrates
 nicotinic acid - release of energy from carbohydrates
 NSP (wholegrain bread - elimination of waste
 protein (gluten) - growth and repair
 max. 6 marks for nutrient + function max.[6]

Ingredients

strong flour - high gluten content
 yeast - raising agent
 warmth, moisture, food and time - conditions for growth
 sieve flour and salt - salt inhibits yeast, mix together
 rub in fat - helps to keep longer, distributes evenly
 cream yeast with sugar - food to begin budding
 warm liquid - encourages yeast growth
 leave to sponge - allow yeast to multiply
 knead thoroughly - develop gluten
 can use dough hook on electric mixer or use processor - quick, efficient
 soft elastic dough - so carbon dioxide can raise it
 warm place to rise - yeast multiplies - high temperature kills yeast
 cover - to prevent surface drying
 knead thoroughly - break large bubbles of gas - further develop gluten
 shape - allow space on baking tray or in tin for proving
 grease(and flour) tin - easier to remove
 prove to double size - open texture, light result
 hot oven / gas 8, 225°C, 450°C - to kill yeast, stop rising action, set shape
 bake until golden brown and sounds hollow - protein has set shape
 cooling tray - to allow steam to escape

11 + well-explained points

11
[20]

14

Bacteria present in air, on skin, on clothes and on food
 cross-contamination - bacteria pass from one to another - by touch or in air -
 cause food poisoning - salmonella, staphylococcus etc
 sickness, diarrhoea, headaches etc,
 need food, moisture, warmth and time to multiply
 most multiplication at around 37°C
 taste, smell and appearance of food unchanged

at least 6 points - 3 marks

Shopping

buy from clean shops - no animals - no flies - covered
 no licking fingers - blowing in bags - clean overalls - hair covered etc.
 look at 'sell by' dates - choose shops with a quick turnover
 no damaged cans - bacteria could have entered - do not buy cracked eggs
 store frozen food quickly after purchasing etc.

Storing

clean containers - cool e.g. refrigerator - covered
 raw meat at bottom of fridge - follow 'use by date' - use in rotation
 eat left-over foods within 24 hours
 clean cupboards - remove crumbs - attracts mice and rats
 cool food before putting in refrigerator etc.

Personal

hair tied back or covered - clean overall - no coughing - no smoking
 wash hands before starting to cook - and after visiting the toilet
 short, clean nails
 cuts covered with waterproof dressing - do not cook if ill
 no licking spoons or fingers - do not touch hair or face when cooking etc.

Preparation

clean equipment - wash in hot, soapy water - dry on clean teatowel or leave in air
 different equipment and chopping boards for raw and cooked food - no pets in kitchen -
 cover waste bin - empty frequently - wash bin after emptying - mesh on windows -
 cover food - wipe up spills immediately
 clean work surfaces - sterilise dishcloths and teatowels - defrost frozen food thoroughly -
 etc

Cooking

cook thoroughly - centre must reach 70°C for 2 minutes - use food probe -

max. 34 points - 17 marks for facts and explanations

[20]

15. sedentary workers - low energy use in occupation
illness - little activity
those who wish to lose weight - use stored energy (fat)
elderly people - activity slows down
max. 4 groups + reasons

4 marks

fat has highest calorific value / g - 9 kcal / g - best to reduce fat intake
use white meat (chicken etc.) instead of red meat - trim off visible fat -
grill instead of fry - drain fried foods on absorbent paper - cut chips thickly -
avoid fatty snacks - e.g. crisps, nuts etc. - less cheese - use low fat cheese -
e.g. Edam, cottage cheese - semi-skimmed or skimmed milk -
less baked foods with hidden fat - e.g. pastry, cakes and biscuits - reduce fat in recipes -
reduce sugar intake - empty calories - sugar contains no other nutrients -
use less in drinks - use artificial sweetener - fruit juice in natural juice - fruit for sugar -
also provides other nutrients and NSP - reduce in baked goods - less sweets and cakes -
no snacking - unless fresh fruit or vegetables - low calorie drinks e.g. Diet Coke -
increase NSP - filling - wholemeal flour, pasta, brown rice - whole-wheat bread -
breakfast cereals with bran - NSP cannot be digested so no calories - filling -
increase fresh fruit and vegetables to 5 servings a day -
low fat may reduce risk of CHD - especially if saturated fat reduced - contains cholesterol
blocks arteries etc. - + any other relevant information

max. 32 points for facts, explanations and examples to illustrate 16 marks

[20]