MARK SCHEME for the October/November 2011 question paper
for the guidance of teachers

6065 FOOD AND NUTRITION
6065/01 Paper 1 (Written), maximum raw mark 100

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Section A

1 (a) Named fats
accept suitable named examples × 4 –
e.g. butter / cream / lard / suet / dripping / ghee / margarine –

4 points (2 points = 1 mark) [2]

Named oils
accept suitable named examples × 4 –
e.g. fish liver oil (or a named example) / nut oil (or a named example) / ground nut / coconut / olive / palm / sesame / soya –

4 points (2 points = 1 mark) [2]

(b) Fats as oils
fats are solid at room temperature and oils are liquid –

1 mark [1]

(c) Functions of fat
energy –
warmth –
insulation –
protection of internal organs / shock absorber –
to convey fat soluble vitamin (or named examples e.g. A D E K) / contains vitamins A D E K

to form a fuel reserve –
forms part of structure of cell membrane –
gives feeling of fullness (satiety) after a meal –

4 x 1 mark [4]

(d) (i) Saturated fat
hard / solid – less reactive fat –
carbon atoms saturated with hydrogen / the fat molecule contains max. number of hydrogen atoms –
no double bonds between carbon atoms – only single bonds –
usually from animals –

(credit information shown on a diagram)

2 x 1 mark [2]

(ii) Polyunsaturated fat
softer fats – more reactive fat –
fat molecule contains more than one double bond in the carbon chain / two or more double bonds in the carbon chain –
does not contain max. number of hydrogen atoms / can accept more H₂ –
the more double bonds the softer the fat –
usually from plants –
(credit information shown on a diagram)

2 x 1 mark [2]
(iii) Essential fatty acids

must be included in the diet – because cannot be manufactured by the body –
deficiency causes dry skin / poor hair / diarrhoea (allow 2 max. effects of deficiency)

2 x 1 mark \[2\]

(e) (i) (fats digested in) duodenum –

(ii) bile (emulsifies fats) –

(iii) (emulsification is necessary) to break fat into tiny droplets /
to increase the total surface area of the fat –

(iv) (fat is broken down by enzyme) lipase –

(v) (fat is broken into) glycerol and fatty acid –

(vi) (1g of absorbed fat produces) 9 kcal – 9 Calories – 37 kJ –

6 x 1 mark \[6\]

(f) Problems associated with high fat intake

excess fat stored in the body causes obesity –
high intake of animal fat means high cholesterol in diet –
fat / cholesterol deposited in arteries –
can cause CHD / heart attack / stroke –
obesity may lead to breathlessness / lethargy / lack of self-esteem –

3 x 1 mark each \[3\]

(g) Name, function and source of two fat-soluble vitamins

1. Vitamin A (retinol) 1 point

Functions

makes visual purple – in retina of eye –
to enable the eye to perceive things in dim light / at night –
prevents Night Blindness –
required to keep mucous membranes moist – and free from infection
example of mucous membranes e.g. throat / digestive / bronchial / excretory tracts –
any example – 1 point (1 only)
for healthy skin –
required for growth –

4 points

Animal Sources (as retinol)
milk – cheese – eggs / egg yolk – butter – liver – kidney – oily fish / e.g. fish liver oils –

Plant Sources (as carotene)
prunes – margarine – orange – papaya –

3 points
2. Vitamin D (cholecalciferol)  1 point

   functions
   formation / maintenance of bones / teeth –
   absorption of calcium / phosphorus –
   prevents rickets in children – rickets symptoms –
   prevents osteomalacia in adults – soft bones –
   growth –

   4 points

   sources
   products – yoghurt –
   sunlight / ultra violet rays of the sun –

   3 points  [4]

3. Vitamin E (tocopherol)  1 point

   functions
   healthy skin –
   protection against heart disease –
   fertility / reproduction in some animals –
   antioxidant –

   4 points

   sources
   eggs – nuts – seeds – cereal products – vegetable oils –

   3 points  [4]

4. Vitamin K  1 point

   functions
   clotting of blood  1 point

   sources
   fruit – cereals – meat – liver – (bacteria in large intestine) –

   3 points  [4]

For each vitamin, 8 points max. (2 points = 1 mark.)
(h) (i) **Nutritional needs of elderly women**
calcium and phosphorus – prevent osteoporosis / for strengthening bones – 
less carbohydrate / reduced energy giving food – less active –
vitamin C – to resist infections / absorb iron –
less fat – difficult to digest or increase risk of CHD / obesity (as less active) –
less salt – hypertension –
NSP – prevent constipation –
4 nutrients + 4 reasons

8 points (2 points = 1 mark) [4]

(ii) **Nutritional needs of very active teenagers**
more carbohydrate / high energy food – more energy needed –
at least a third of energy from fat – higher calorific value / less bulky –
more protein – growth spurt / body building –
more calcium / phosphorus – bones and teeth –
more vitamin D – absorption of calcium –
more water – to replace water lost in perspiration –
more NaCl / sodium chloride / salt – to replace salt lost in perspiration –
more vitamin B thiamin – to release energy from carbohydrate –
more iron – carries oxygen for cell respiration / energy release –
more vitamin C – absorption of iron –
4 nutrients + 4 reasons

8 points (2 points = 1 mark) [4]

[Section A Total: 40]
Section B

2 (a) **Gelatinisation**
e.g. custard / roux sauce / cooking cakes / rice / macaroni –

6 points (must include an example) (2 points = 1 mark)  

(b) **Coagulation**
heat – on protein – denatures – from 40 °C – coagulation begins at 60 °C – cannot be reversed – hardens / sets –
chemical structure changes
e.g. boiled egg / egg custard / roast meat / baked bread –

6 points (must include an example) (2 points = 1 mark)  

(c) **Fermentation**
yeast – produces carbon dioxide – and alcohol / ethanol – with food / sugar / glucose – moisture – warmth –
enzymes / named (e.g. maltase / invertase / zymase)
e.g. bread-making –

6 points (must include an example) (2 points = 1 mark)  

(d) **Pasteurisation**
heat – destroys harmful bacteria – and souring bacteria –
does not prevent decay – keeps longer –
72 °C / 162 °F – for 15 seconds – HTST or Flash –
145 °C – for 30 minutes – Holder method –
cool rapidly – to prevent bacterial growth to below 10 °C
e.g. milk –

6 points (must include example) (2 points = 1 mark)  

(e) **Hydrogenation**
H₂ added makes fat solid – from liquid oil – e.g. sunflower / soya – unsaturated fats – can take up hydrogen to make oil saturated– uses a nickel catalyst – can be stopped at any time to achieve degree of hardness required
e.g. margarine –

6 points (must include example) (2 points = 1 mark)  

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3 (a) Purpose of ingredients in Victoria sandwich cake

(i) Self-raising Flour
- adds bulk – main ingredient
- carbohydrate – provides energy
- gluten – forms framework / sets on heating
- contains baking powder – raising agent
- traps air during sieving – raising agent

6 points (2 points = 1 mark) [3]

(ii) Sugar
- softens crumb / sweetens / adds flavour / taste
- traps air when creamed – raising agent / lightens texture
- carmelises – dry heat during baking / browns / colour
- preserves – high sugar concentration / helps to retain moisture

6 points (2 points = 1 mark) [3]

(iii) Margarine
- retains moisture – keeps cake fresh longer
- high energy – fat concentrated source of energy
- traps air when creamed – raising agent / lightens
- adds colour
- adds flavour
- adds nutrients – vitamins A and D added during manufacture

6 points (2 points = 1 mark) [3]

(iv) Eggs
- protein – growth / repair
- iron – haemoglobin
- gives shape – protein coagulates on heating
- colour – depends on brightness of yolk
- emulsifies – holds fat and water separate / prevents curdling
- traps air when beaten – raising agent / lightens
- flavour
- water – (steam) raising agent

6 points (2 points = 1 mark) [3]
(b) (i) The cake has risen to a peak then cracked
- oven temperature too high –
- too much mixture for the size of tin –
- too high oven shelf –

(ii) Close textured cake
- too much liquid in mixture –
- too little raising agent used –
- not enough creaming –
- mixture has curdled –
- oven temperature too low –
- cake not cooked for long enough –
- overbeating when adding flour – causes loss of air –
- overbeating after adding liquid –
- not sieved –
- wrong proportions –
- opens oven door too much before cake sets –

6 points (must be at least 1 from each section) (2 points = 1 mark) [3]

4 (a) Reasons for preserving food
- kills bacteria – e.g. milk
- to keep longer / prevents decay – e.g. canned meat, dried fruit
- give variety – e.g. jam, pickles
- reduces transport cost – e.g. convenience foods
- less bulky – e.g. dried milk
- easier to transport – e.g. frozen meat from New Zealand, canned corned beef from Argentina, dried fruit from Greece etc.
- enjoy food from other lands – e.g. pineapples from South Africa etc.
- enjoy foods out of season – e.g. frozen strawberries
- make use of food when cheap and plentiful e.g. seasonal fruit
- to avoid waste – e.g. named seasonal fruit or vegetable
- cope with a glut – e.g. cannot use all produce at once
- good for emergencies – e.g. dried milk, frozen meat

8 points (2 points = 1 mark) (must include example for each) [4]
(b) Preventing decay

(i) Freezing
low temperature prevents growth of micro-organisms, need warmth / 37°C – water unavailable / frozen, need moisture to multiply – 1 well-explained point

(ii) Jam-making
high sugar content 60%, inhibits growth of micro–organisms – or boil / high temperature during process, destroys micro-organisms – or jars sealed, to prevent entry of micro-organisms from air – 1 well-explained point

(iii) Drying
water removed, micro-organisms need water to multiply – or food supply too concentrated, micro-organisms need dilute food supply – 1 well-explained point

(c) EITHER JAM-MAKING OR FREEZING

Jam-making
use ripe or just under-ripe fruit – more pectin
prepare fruit according to type – remove inedible parts, stones, cut up etc.
boil / stew fruit to soften – release pectin / make fruit palatable
test for pectin – fruit rich in pectin / commercial pectin may be needed
only add sugar when skins are soft – will not get softer with sugar / osmotic effect of sugar hardens skins
stir until sugar is dissolved – to prevent burning on bottom of pan
boil rapidly – to reach setting point
test for setting point – description of wrinkle test / flake test. temperature or 220°C
fill jars almost to the top – less room for air / jam shrinks when cooling
label with name and date – must use in rotation / to identify
store in cool, dark place – to maintain colour / prevent growth of mould

10 points (2 points = 1 mark)

Freezing
choose undamaged fruit – good appearance of finished product
prepare fruit according to kind – remove inedible parts / cut up
spread fruit onto open trays – freeze separately / easier to thaw and use later
cook if necessary – easier to store / less bulky / saves cooking time later
pack into containers according to amount used at one time – to avoid waste / defrost quicker
pack in airtight containers – to prevent ‘freezer burn’
label with name, date, quantity – identify / use when quality still good
freeze quickly – small ice crystals prevent damage to cell

10 points (2 points = 1 mark)
(d) Pectin
poly saccharide –
complex carbohydrate – found in fruit and some root vegetables –
name one good source (e.g. apples) –
name one poor source (e.g. strawberries) –
important as setting agent in jam – sugar needed to give set –
lower pH will aid setting – lemon juice often used – 65% acid content –
pectin changes to pectic acid as fruit ripens – under-ripe fruit best for jam –
test for pectin – description –

6 points (2 points = 1 mark)

5 (a) Advantages and disadvantages of frying

advantages
quick – food browns / colour – crisp surface – adds nutrients without adding bulk – develops
flavour – develops aroma – fat / vitamins A / D added –

disadvantages
uses a lot of fat – expensive outlay – against ‘healthy eating’ guidelines – fat may be difficult
to digest – dangerous method of cooking – if overheated could cause fire – needs constant
attention – food could be greasy and unappetising – heat sensitive nutrients lost –

10 points (covering both areas) (2 points = 1 mark)

(b) Care and choice of saucepans

choice of saucepans
must suit cooking stove – thick base for electric cooker – retain heat –
well balanced – to prevent tipping over –
insulated handles and knobs – to prevent burning –
well-fitting lids – to prevent loss of heat and steam –
base should cover hotplate – prevents waste of heat – more economical –
non-stick coating – easier to clean –
enamel outside – to match kitchen decor –
buy the best that can afford – less need to replace frequently –
copper bases – good conductor of heat – more efficient –
glass – can see what is cooking –
stainless steel – hard wearing / easier to clean –
iron – cheaper – stains –
aluminium – lightweight – dents when dropped – not balanced on stove –
choose a variety of sizes – to suit uses / size of family –

care of saucepans
soak – to remove burnt on food –
wash in hot soapy water – removes grease –
dry thoroughly – prevents rusting – discourages smells and growth of bacteria –
do not stack – prevents scratching –
do not use steel wool or metal spoons on non-stick pans – removes coating –
store in dry place – prevents rusting –

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

   10 points (2 points = 1 mark) [5]

6 (a) Nutrients in red meat

   6 points (2 points = 1 mark) [3]

(b) Tenderising meat before cooking
   hammer / beating – mincing or cutting into small / thin pieces – hanging – score
   soak / marinade in acid (wine / vinegar / lemon juice) –
   use of enzymes / papain (from papaya) / bromalin (from pineapple) –
   (Do not allow ‘use of tenderising powders’ or ‘meat tenderizer’.)

   4 points (2 points = 1 mark) [2]

(c) (i) Moist methods of cooking
   braising – boiling – stewing – steaming –

   4 points = 1 mark [1]

(ii) Changes during cooking of tough meat
   insoluble – collagen – changes to gelatine – which is soluble –
   fibres fall apart – fat melts – colour change from red to brown –
   meat shrinks – extractives squeezed out – protein coagulates –

   8 points (2 points = 1 mark) [4]
### (d) Reasons to reduce red meat intake
- Contains saturated fat – high in cholesterol – blocks arteries –
- Can lead to CHD – high blood pressure – strokes –
- Fat can cause obesity/weight gain – can result in breathlessness –

6 points (2 points = 1 mark)

### Alternatives to red meat
- White meat (or named e.g. chicken/turkey) – fish – soya beans – eggs/cheese/milk

4 points (2 points = 1 mark)  

### 7 (a) Types of convenience foods (not freezing)

<table>
<thead>
<tr>
<th>Type</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>canned</td>
<td>pineapples/corned beef/tuna</td>
</tr>
<tr>
<td>dried</td>
<td>milk/currants/yeast</td>
</tr>
<tr>
<td>ready made</td>
<td>biscuits/breakfast cereals/yoghurt</td>
</tr>
<tr>
<td>ready to cook</td>
<td>cook chill</td>
</tr>
</tbody>
</table>

Name + example of 3 types
6 points (2 points = 1 mark)

### (b) Advantages of convenience foods
- Quick to prepare – easy to prepare – save fuel – easy to store – easy to transport – can be kept for emergencies – little waste – wide variety available – cook may not have the ability to prepare the product well (e.g. puff pastry) – enjoy foods out of season – enjoy foods unavailable in country – less washing up – less equipment used –

### Disadvantages of convenience foods

8 points (covering both parts) (2 points = 1 mark)
(c) **Additives in Convenience Foods**

- used to maintain nutritional quality (e.g. add vit. C to juices) –
- improve keeping quality –
- to make food more attractive / add aroma / colour / flavour –
- can improve texture / consistency –
- emulsify oil and water –
- prevent rancidity in fats (anti-oxidants) –
- can be natural but not found in the particular food to which added –
- may be synthetic (e.g. vitamin C) –
- can be artificial – those with E numbers have been approved by the European Community –
- must be used in the smallest amount possible to produce the desired effect –
- some people are intolerant / are allergic to certain additives –
- long-term effect is not known –
- danger of adding nut extracts for someone allergic to nuts –

8 points (2 points = 1 mark) [4]

(d) **Freezing**

- maintain temperature in body of freezer at −18°C –
- to prevent growth of micro-organisms –
- most foods contain large amounts of water – ice crystals form when frozen –
- fruit and vegetables can be damaged by ice crystals if too large –
- cells rupture if ice crystal exceeds size of cell –
- structure collapses when food is thawed –
- liquid released –
- large crystals form when food is frozen too slowly –
- frozen at −24°C – small ice crystals –
- remain inside cells without rupturing –
- to quick freeze, drop temperature from 0°C to −4°C in 30 minutes –

**Storing frozen food**

- airtight containers – prevent surface from drying – remove air from plastic bags –
- label with name, date, quantity – use in rotation –
- once thawed, do not refreeze – bacterial growth / cell damage –
- packages tightly fitted together – maintain coldness / use space economically –
- open freezer for as little time as possible – risk of thawing food –

8 points (covering both parts) (2 points = 1 mark) [4]

[Section B Total: 60]

[Paper Total: 100]