VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

2008 Food and Technology GA 3: Written examination

GENERAL COMMENTS

The 2008 examination was designed to assess students' knowledge and understanding of Unit 3, Areas of Study 1, 2 and 3 and Unit 4, Areas of Study 1, 2 and 3. All key knowledge and skills that underpin the outcomes were examinable.

The seven examination assessment criteria listed on page 23 of the *Food and Technology Assessment Handbook* were drawn from the six Areas of Study. The paper consisted of seven short answer questions that were based on the criteria.

Areas of strengths and weakness

Strengths

- understanding the role of enzymes in food
- understanding the requirements of labelling
- understanding the role of considerations and constraints found within a design brief
- explaining the difference between primary and secondary processing
- demonstrating an understanding of health and safety practices in food storage and preparation
- demonstrating an understanding of the reasons and methods used to preserve foods
- understanding the difference between food spoilage and food poisoning
- understanding and identifying marketing strategies used in food promotion
- understanding the role of packaging

Weaknesses

- providing answers that were irrelevant or not directly related to the questions asked
- not giving examples when required
- not reading the information provided in the question and failing to relate the answer to this information
- understanding new technological developments in the food industry
- understanding what constitutes 'health claims' and 'functional foods'
- understanding and describing how to minimise the impact of farming practices on the environment while maintaining economic advantage
- understanding and explaining the stages in new product development
- explaining the advantages and disadvantages of genetically modified foods for consumers and/or food producers
- defining genetic modification and the process of plant breeding
- explaining the responsibilities of Food Standards Australia New Zealand (FSANZ) and associated consumer benefits
- explaining the HACCP system and its role in ensuring safe food production
- understanding the levels of authority in Australia (national, state and local) and their responsibilities, roles and interrelationship in ensuring a safe food supply
- understanding the role of sensory testing and the methods used to record results
- explaining complex processes used in food production
- understanding of terms used in the study design; for example, strategies, sensory properties, plant breeding, product development, functions and genetic modification
- understanding the meaning of ethical marketing
- understanding the stages involved in the development of new food products

This report should be read in conjunction with the 2008 Food and Technology examination paper.

SPECIFIC INFORMATION

Note: Student responses reproduced herein have not been corrected for grammar, spelling or factual information.

For each question, an outline answer (or answers) is provided. In some cases the answer given is not the only answer that could have been awarded marks.

Question 1a.

Marks	0	1	2	3	4	Average
%	21	16	19	22	22	2.1

Suitable responses could have included:

- ingredient – butter
  natural food component – fat
  function – provides mouth feel, prevents the development of gluten, forms a liquid component once it is melted and absorbs the flour, adds flavour
- ingredient – flour
  natural food component – starch
  function – provides a thickening agent in the process called gelatinisation.

Question 1b.

Marks	0	1	2	3	4	Average
%	13	15	26	23	23	**2.3**

Two of the following were suitable responses.

Ingredient	Natural food component	Changes
Egg	Protein	• Heat coagulates the protein, giving the lasagne a firmer structure. • Helps to thicken and set the sauce.
Cheese	Protein Fat	• Coagulates when heat is applied. • Melts and browns on the surface of the lasagne when heated, creating a browning effect.
Pasta	Starch	• Starch in the pasta absorbs liquid from the sauce and therefore softens, gelatinises and increases in size.

Students needed to name pasta as the ingredient, and not flour as it was not an identified ingredient. Students could not repeat their answer to Question 1a. and still gain marks.

Question 1c–d.

Marks	0	1	2	3	Average
%	10	28	43	19	**1.7**

1c.

Depending on the student's choice of physical or sensory properties, suitable responses could have included the following.

Physical properties

The physical properties of the two lasagnes, such as weight, volume, meatiness or density of the meat sauce, viscosity of the cheese sauce, nutrient content and proportion of ingredients may be compared and the information recorded. For example, using scales to weigh two equal sized portions.

Sensory testing

- Profiling test: a star diagram to compare the profile of the particular features of the two lasagnes, such as fattiness, saltiness, tomato flavour, cheese sauce flavour.
- Sensory test: this may include taste testing, appearance, mouth feel, texture, aroma – this could be carried out by a panel of tasters who then record their results.
- Preference test: participants will taste the food and indicate their preference by either hedonic descriptors, numerical ranking or descriptive terms (for example, 'delicious'). Tasters tick a box as to how each lasagne rates according to their preference.
- Difference test: both products are compared and the differences recorded – triangle test or two out of five test.

One mark was awarded for identifying the test and one mark was awarded for describing the test.

1d.

A suitable response could have included one of:

- the lasagne cooked in the microwave will not brown as it would if it was cooked in an oven
- the cooking time will be shorter and the top will not brown
- the pasta will be rubbery in texture when cooked in the microwave.

Question 2a.

Marks	0	1	2	Average
%	48	33	19	**0.7**

Suitable responses could have included any one of:

- genetic modification involves the application of genetic engineering to directly manipulate the genetic make-up of organisms. It involves a gene from one plant or animal being spliced onto another to improve its characteristics
- gene technology is used to introduce a desired trait into another plant or animal to improve its characteristics.

Following is an example of a good response to this question.

The process of genetic modification involves the splicing of a particular gene from a plant or animal into another in order to improve its characteristics. This process is used in canola to make it disease resistant and therefore produce higher yields.

Question 2b.

Marks	0	1	2	3	4	Average
%	41	17	20	8	13	**1.4**

Suitable environmental impacts could have included any combination of the following.

Positive impacts	Negative impacts
Genetically modified canola plants germinate earlier and grow with more vigour. They have large robust leaves, which means they can dominate the weeds. It only requires one rather than three sprays of herbicide for non genetically modified canola.	Tougher weeds may develop. They will have a negative impact on the environment as they may be more difficult to kill and will become more widespread.
Less land may be needed for crop production if genetically modified (GM) crops have a higher yield, providing the opportunity for a greater diversity of crops to be grown on less acreage.	The pollen from genetically modified crops such as canola can drift onto the crops of conventional and organic farmers, contaminating their crops. This is known as 'genetic pollution'.
Some plants may be designed to be tolerant to drought, high-salt soils or extreme cold, therefore enabling farmers to grow crops in soils which were previously unsuitable for farming.	There is a concern that Monarch butterfly caterpillars will die if they feed on milkweed that has been contaminated by pollen from Bt corn.
Less chemicals used in farming to prevent insect infestation and/or growth of weeds may lead to lower levels of herbicide and pesticide use.	Evidence exists to show that some of the plants that birds and insects thrive on are threatened when GM crops are planted. This can affect the viability of some bird populations.

Students needed to state the impact and provide an example to demonstrate their understanding.

This question was very poorly done.

Question 2ci–ii.

Marks	0	1	2	3	Average
%	24	27	24	25	**1.5**

2ci.

Either of:

- FSANZ
- Food Standards Australia New Zealand.

The acronym and/or the full name were accepted, but unfortunately some students gave the incorrect meaning of the acronym when they expanded it into words. Many students gave Food Safety Australia and New Zealand, which was incorrect. ANZFA was not accepted.

2cii.

A suitable response could have included any of the following responsibilities:

- FSANZ develops the Food Standards Code – any changes to the FSC requires public consultation

- FSANZ requires that an ingredient that has been genetically modified must be clearly labelled as a GM product, with the exception of products which are highly refined, for example, canola oil
- FSANZ coordinates the recall of contaminated foods
- FSANZ undertakes research into a wide variety of foods, including genetically modified foods in order to protect public health and safety
- FSANZ undertakes a safety assessment for a GM commodity by comparing the molecular, toxicological and nutritional and compositional properties of the food to the non GM form
- FSANZ regularly reviews procedures for assessment to ensure that recent scientific and regulatory developments are reflected in the process
- AQIS coordinates national food surveillance, including importation of all food into Australia (including GM food), to ensure it complies with the Food Standards Code.

One mark was awarded for identifying the responsibility of the authority named and one mark for describing how genetically modified food is of high quality and safe to eat.

Question 2d.

Marks	0	1	2	3	Average
%	32	24	23	21	1.3

A suitable response could have included some of the following information about how the national, state and local authorities work together if a food is found to be unsafe.

Food Recall

National

- FSANZ coordinates food recalls nationally by informing state health authorities of potential food related health issues, providing advice regarding communications and recall strategies, liaising with quarantine services where imported goods are involved and maintaining detailed records of recalls.

State

- FSANZ monitors the efficiency and effectiveness of food recalls by providing details of recalls to relevant organisations such as councils, food businesses and other government and community agencies that may be affected, ensuring the recovery and destruction of affected goods and liaising with FSANZ about recall actions.

Local

- FSANZ has no legislative powers to order recalls, but may be delegated functions by the state health authority, for example, to ensure information about the recall is available at the point of sale and to oversee the collection and destruction of recalled food.

A safe food supply and/or *Food Act 1984*

National

- FSANZ develops the Food Standards Code, from which the states develop their food Acts. These Acts control the manufacture of food in Australia.
- Development of standards for processing and primary production – all food businesses involved in the production, manufacturing and retail of food are required to develop a food safety program based on the HACCP principles

State

- The Victorian Government developed the *Food Act 1984* and the *Food (Amendment) Act 1997*, which outline the legal responsibilities of all food manufacturers and retailers in Victoria to ensure a safe food supply.
- The State Government can issue 'closing orders' against a food premises if a food contamination incident occurs.

Local

- Environmental health officers inspect food premises on behalf of local councils.
- Registration of food businesses which have an approved food safety plan.
- Inspect all food premises on an annual basis.
- Local governments follow up on 'closing orders' in the case of a food contamination incident. The council takes action to ensure the premises are cleaned according the Food Premises Code.

To receive full marks, the three parts to the answer must have been interrelated. Students are reminded that FSANZ coordinates (but does not police) food recalls. It is the local council which ensures that the food has been removed from the shelves.

This question was poorly done.

Following is an example of a good response to this question.

> ***National:*** *Inform the state health authorities of the food related problem and coordinate the recall across Australia.*
>
> ***State:*** *They apply the food recall system including notifying the local councils of the product being recalled.*
>
> ***Local:*** *They ensure that the food has been removed from the shelves and destroyed*

Question 3a–b.

Marks	0	1	2	3	4	Average
%	20	21	23	16	21	**2**

3a.
The term 'health claim' describes a claim made about a direct relationship or link between a specific nutrient and the reduced risk of a disease or improved state of health.

3b.
Students were required to provide the following information in their response.
A functional food is:

- a food that provides a health benefit to individuals beyond that of the traditional nutrients it contains
- any food or ingredient that may provide a health benefit beyond the traditional nutrients it contains.

Students were required to provide the following information in their answers.
The Vaalia low fat with omega-3 yoghurt is considered a functional food because:

- it contains the nutrient omega-3, which is not normally found in dairy products and is important for brain development
- the yoghurt is low fat, therefore it will contain fewer kilojoules than traditional yoghurt and will be of benefit to people who wish to lose weight.

It was not acceptable to give the addition of strawberry or vanilla flavouring as the reason for the term 'functional food'.

Question 3c.

Marks	0	1	2	Average
%	14	21	65	**1.5**

The target market for this yoghurt and why it meets their demands could have been one of:

- people who are health/weight/diet conscious – the yoghurt is low fat and therefore may help people who wish to reduce their weight or simply limit their saturated fat or cholesterol intake
- assists with brain function throughout life.

A suitable response needed to include both a suitable target market and an explanation of why this product will meet the demands of the suggested target market.

Question 3d.

Marks	0	1	2	3	4	Average
%	18	15	25	20	23	**2.1**

Development of a prototype
The development of a prototype is important because it allows the manufacturer to produce a sample of the finished product. This will allow them to test a small sample of the product and its manufacture to determine:

- the properties of the product – check flavour and/or consistency and/or sensory/omega-3 granules are not obvious
- an ingredient of the product – does the yoghurt set, is it an acceptable colour?

- the manufacturing process – to test all machinery
- the cost-effectiveness of processes
- the storage/shelf life of the product
- the suitability of proposed packaging and/or labelling.

Product evaluation
Evaluation of the product against the design brief criteria – to make sure it meets requirements, considerations and constraints in the design brief.

OR

Product testing, using one of the many tests for physical, chemical or sensory properties – check that the sensory properties (flavour, appearance, etc.) meet the requirements of the brief and will be acceptable to consumers.

OR

When the product is in the marketplace the yoghurt can be assessed to see if a profit is being made and the sales are high enough.

Following is an example of a good response to this question.

The product is produced on a small scale to test production, the sensory properties of the product and if they are satisfactory and whether the product is viable to produce. The yoghurt may be tested to ensure that you cannot taste or smell the omega 3(from fish oil).

Product evaluation involves the evaluation of:

1. Marketing- to see if the product has been promoted effectively.

2. Sensory properties – to see if the taste, texture, smells will be acceptable to the consumers.

3. Profit being made – to find out if the sales are high enough to give a profit to the manufacturer.

Question 3e.

Marks	0	1	Average
%	28	72	**0.7**

Line Extension

Question 3fi–ii.

Marks	0	1	2	3	Average
%	67	6	8	19	**0.8**

Suitable answers to list a new and emerging food and describe the technology used in developing this food could have included one of:

- Lite Start milk or other new milks
  Ultrafiltration – this occurs when milk is pumped through a series of membranes that separate dissolved or suspended solids, such as fat from milk
- omega-3 in Tip Top bread, omega-3 added to breakfast cereals, milk, and margarine
  microencapsulation – an active ingredient, such as omega-3 fatty acid, is surrounded by a thin biodegradable shield forming a minute capsule (to protect it during processing or to mask the flavour or odour)
- Flavr savr tomatoes, faster growth rates in cattle, non-browning/non-sprouting potatoes
  Genetic modification – involves the application of genetic engineering to directly manipulate genetic information. This is done by selecting the desired characteristics and transferring them by splicing them into another plant or animal to create a species with improved characteristics.
- Hi-maize, delayed ripening pineapple, seedless watermelons, broccolini, baby cos lettuce, baby bok choy, purple cauliflower
  Plant breeding – the use of technology to select chosen characteristics (genes) from a plant (from a related species) and place into another plant in a laboratory environment to create new plant varieties. This process is quicker and more accurate than traditional plant breeding.

One mark was awarded for identifying the technology and two marks for the description of this technology. Pasteurisation, homogenisation, UHT or microwave technology were not accepted.

This question was very poorly answered.

Following is an example of a good response.

New and emerging food – Up Bread is bread that contains omega 3 and the technology used is microencapsulation.

Droplets of fish oil are encased in a shield to form a minute capsule and added to the bread. This capsule prevents the sensory properties like taste and smell of the fish oil from being detected by the consumer.

Question 4a.

Marks	0	1	2	3	4	Average
%	6	3	15	16	61	3.2

A suitable response taken from the design brief provided could have included two of the following examples.

Consideration and/or constraint	Explanation
A barbecue at the local park	The type of foods served must be suitable to serve in an outdoor setting.
The caterer providing all food items apart from the meats	Foods prepared must be suitable to accompany meats and suit other aspects of the menu.
Foods able to be transported safely to the picnic	Food must be suitable to be transported to the park and safe food handling should be taken into consideration, including temperature control.
Foods able to be stored before being served	Food must be able to be stored safely before serving and cooking. Consideration should be given to temperature control because of the park location, season and time of year.
Appeal to people with a wide variety of tastes	A wide range of foods should be included, such as different salad ingredients to appeal to the guests' varying tastes.
Some guests are vegetarian	It is important to ensure that vegetarian options are included so all guests are catered for.
Some food to be prepared in advance and have good keeping qualities	Some food items must be suitable to preserve and should not need last minute preparation.
Use a range of cooking techniques	Food items selected should use a range of cooking techniques, for example, bread making, preserving, stir-frying, to enable the caterer to demonstrate their skill.

Question 4b.

Marks	0	1	2	Average
%	31	34	35	1.1

Using considerations and constraints as relevant starting point, students needed to provide two examples of information needed before deciding about the food items to be served. These could have included:

- investigate the sensory properties of foods
- suitable processing techniques and preservation methods
- foods in season
- food that store well
- safety and hygiene requirements
- foods to accompany cooked meats
- foods that are suitable for a barbecue at the local park
- foods that are suitable for vegetarians.

Question 4c.

Marks	0	1	2	3	4	Average
%	27	8	28	12	25	2

Component of a design plan folio	Explanation of importance
Criteria for evaluation	Based on the specifications in the design brief – enables the caterer to determine whether the food items selected for the barbecue meet the needs set out in the brief.
Developing ideas about the food products that will meet the needs of the design brief	Looking through recipe books, food magazines, watching television cooking programs or exploring local food markets will provide a wide range of ideas for suitable food products for the barbecue. The caterer can use these to finalise decisions about the most appropriate foods to serve.
Information about food processes to be undertaken	The caterer can ensure that they have the necessary knowledge and skill to successfully undertake all of the complex processes involved in producing each of the food items.
Justification for selection of final food items	Ensures that the caterer has considered all of the specifications set out in the design brief when making the final selection of food items for the barbecue, and that all food items will satisfy the needs of the brief.
Production plan/sequence of operations	It is important to develop a logical work/production plan as it will provide clear steps for the caterer to follow and ensure that all food items are produced in the allocated time.
Food orders	Accurate food orders are important to ensure that all ingredients are available when each food item is prepared.
Safety and hygiene requirements of foods and tools and equipment	It is essential for the caterer to clearly recognise and understand all of the food safety and hygiene requirements that are essential to produce, store and serve the food for the barbecue safely.
Evaluation using the previously established criteria	Undertaking an evaluation using the previously established criteria will enable the caterer to determine whether he/she has been successful in meeting the requirements of the design brief.
Production evaluation	By completing an evaluation of all of the production processes, the caterer is able to review what worked well and any areas that may need improvement for future functions.

Students needed to provide two components of a design plan folio and explain why each of these was important when planning or preparing the food items to be served. This question was very poorly done as many students did not refer to other components of the design plan folio they had completed in their school assessed task.

Question 4d.

Marks	0	1	2	Average
%	18	33	49	**1.3**

Foods that could be served could have included any one of:

- mango chutney – this can be prepared well ahead of time, it keeps well and does not require any refrigeration, it goes well with vegie burgers for vegetarians
- tomato sauce – home-made tomato sauce has great sensory properties that make it a favourite to serve at a barbecue, it can be made well in advance
- greek salad – capsicum can be roasted and skinned several days in advance, tomatoes only require minimal preparation, the salad suits vegetarians
- mayonnaise – can be prepared well in advance, it is very versatile and can be used on a variety of salads such as potato or in a coleslaw, uses the complex process of mayonnaise making (egg yolk base)
- olive bread – can be made in advance and frozen, it adds variety and appeals to people with a wide variety of tastes
- carrot and almond cake shaped like a map of Australia – it is appropriate to serve as a celebration cake at the Aussie barbecue, it keeps well and can be made several days in advance.

One mark was awarded for the identification of a suitable food item and one mark for justification. Some food items suggested by students, for example, pavlova and berries, did not suit the theme of a picnic at a local park.

Question 4e.

Marks	0	1	2	Average
%	5	19	76	**1.7**

A suitable response could have included two of the following health, hygiene and safety practices:

- foods should be stored at the correct temperature before and after preparation to prevent bacteria from growing. Ice or an Esky could be used
- cross-contamination should be avoided by washing both equipment and hands
- good personal hygiene – wash hands, do not wear jewellery, cover cuts, always wear clean clothes and tie hair back. Do not work with food if you are ill
- ensure raw and cooked foods are prepared separately
- always use clean equipment and benches and wash them well after each use
- store cooked foods above raw foods in the fridge before coming to the park and keep them in separate Eskies
- check the use-by dates of the foods when buying them
- keep foods out of the 'danger zone' – above 4°C and below 60°C
- keep and serve hot foods above 60°C.

Question 4fi–ii.

Marks	0	1	2	3	4	5	Average
%	16	10	12	20	17	25	**2.9**

A suitable response could have included the following:
Food item – quiche
Complex process required to produce the food item identified – shortcrust pastry making

	Outline	Explanation
Step 1	Rubbing the butter into the flour with my fingertips or processing in a food machine	I needed to rub the butter in until it looked like fine breadcrumbs before adding any liquid.
Step 2	Kneading the dough	I kneaded the dough with my hands until it was smooth, but did not over knead, as that would toughen the dough

This question was very poorly answered.

Following is an example of a good response.

Food item - Nougat

Complex process required to produce the food item identified – confectionary making

	Description of the key step	***Explanation of the decision made at each step.***
Step 1.	*Heating syrup to required temperature*	*Syrup must be boiled to 160° C to achieve nougat consistency and allow nougat to set*
Step 2.	*Beating egg whites to necessary consistency and firmness*	*The egg white needs to be beaten to stiff peaks to give the desired product when combined with syrup.*

Question 5a.

Marks	0	1	2	3	Average
%	56	13	15	16	**0.9**

Plant breeding: the use of technology to select chosen characteristics (genes) from a plant (from a related species) and place into another plant in a laboratory environment to create new plant varieties. This process is quicker and more accurate than traditional plant breeding.

Plant breeding does not involve the use of characteristics (genes) taken from animals.

This question was very poorly done with many students not clearly defining the process or mixing it up with a definition of genetic modification.

Following is an example of a good response to this question.

Plant breeding. A process when desirable characteristics from one plant are bred with another plant of the same species in a controlled laboratory environment.

Question 5bi–ii.

Marks	0	1	2	Average
%	24	13	63	**1.4**

In a garden salad or as a garnish on an omelette because the Kumato has:

- greater colour variety adding to the aesthetic appeal of the food item
- can be used as green-red-black, therefore a greater variety of dishes can be made
- improved sensory properties of the food item and it has greater sweetness, different texture
- firmer flesh may cut more easily and hold its shape better – will not make other food soggy
- less acid, therefore it is more desirable when eaten raw.

Question 5c.

Marks	0	1	2	Average
%	72	14	14	**0.4**

A suitable response could have included one of the following environmentally friendly methods of farming vegetables:

- less herbicides may be used, therefore there is less expense for the farmer
- increased yields are likely, therefore greater profit
- less water may be used, therefore there is less expense to the farmer in water costs
- may be grown in a controlled environment, therefore there is less damage from pests leading to greater productivity
- if less water is used then the likelihood of salinity developing is reduced and land is not lost to farming
- the Kumato may be grown organically therefore minimising pollution or degradation of the land/environment
- the use of organic farming can maintain long-term soil fertility
- crop rotation to prevent the nutrients in the soil from being depleted over time.

The focus of the answer was an economic advantage for the primary producer. The question was very poorly done.

Following is an example of a good student response.

By implementing crop rotation the producer is able to maximise the use and quality of their soil, ensuring that it is able to be used long term and therefore will be economically beneficial.

Question 5d–e.

Marks	0	1	2	3	4	5	Average
%	14	8	12	17	22	28	**3.1**

5d.
Primary processing takes place after harvesting, when the tomatoes are made safe for consumption or are ready to be turned into other food products. For example, sorting, cleaning, grading or transporting the tomatoes to the retailer for sale. In comparison, secondary processing is when the primary processed tomatoes are made into other products, for example, tomato sauce, soup, chutney, dried tomatoes or tomato paste, by processes such as blanching, chopping, slicing, dicing or cooking.

Slaughter was not acceptable for vegetables and the answer needed to include examples to gain full marks.

5e.

- Enzymes alter the physical or sensory properties of food by:
  - changing the colour of the food
  - causing enzymatic browning when fruit such as an apple or an avocado is cut and exposed to oxygen in the air
  - causing the tomatoes (or other fruit or vegetable) to ripen and soften and become tender
  - the starch content converting to sugar, altering its flavour by making it sweeter or less bitter/tart
  - over-ripening which can cause it to turn, become mushy or 'bad' or 'off'
  - water content increasing.
- enzymes in fruit such as pineapple or paw paw which can be used in marinades to break down the protein in meat
- enzymes in fruit such as pineapple and kiwi fruit contain protease enzymes and will prevent gelatine mixtures from setting or gelling
- enzymes in meat can cause it to break down and go 'off' over time
- enzymes in yeast assist in the process of fermentation and the production of carbon dioxide and are important in enabling bread dough to rise
- the enzyme amylase in flour enables the starch in flour to convert to sugar (maltose)

Question 5fi–ii.

Marks	0	1	2	3	Average
%	24	21	30	25	**1.6**

Techniques to preserve tomatoes could have included any of:

- dehydration: drying tomatoes in the sun or by oven drying decreases the likelihood of deterioration as less moisture is available for the growth of microbes/bacteria
- addition of acids: during the preparation of tomato chutney the addition of acids such as vinegar alters the pH to prevent the growth of micro-organisms
- canning: in heat processing/sterilisation the tomatoes are placed in the can and then sealed; heat processing destroys micro-organisms and their spores
- freezing: when tomatoes are frozen, the use of extreme cold below $^{-}18\,^{\circ}C$ either kills any food spoilage bacteria or stops the growth of micro-organisms, preventing deterioration
- jam making: the high concentration of sugar has a dehydrating effect, therefore less liquid is available, inhibiting microbial growth.

The answer must have included both a description and an explanation of how the named preservation technique will preserve the tomatoes for future use.

Question 6a.

Marks	0	1	2	3	Average
%	24	18	28	30	**1.7**

A suitable response could have included three of the following advantages of continuous processing systems:

- can produce large quantities of pizza quickly and efficiently
- the pizzas will all be uniform in size – topping, baked finish
- the unit cost of each pizza is relatively low
- the process is less labour intensive, therefore leading to a lower unit price
- the ingredients for the pizza can be purchased in bulk and therefore bought at a lower cost
- there is automated checking of critical control points, therefore any hazards are able to be detected easily
- the initial set up may be more expensive, but the unit cost of the pizzas will be lower.

Question 6bi–ii.

Marks	0	1	2	3	Average
%	11	20	34	35	2

The food production system a local pizza store would use is a batch system.

AND

Two possible differences in the physical or sensory properties of the pizzas could have included:

- the topping ingredients of pizzas made by a pizza store may vary between pizzas, whereas M^{c}Cain pizzas would all be uniform
- the sensory properties of pizzas made by a local pizza store may be superior
- pizzas made by the local pizza store can be made to suit individual consumer preferences, enhancing the sensory appeal
- at the local pizza store consumers can mix and match the type of base and topping to suit their personal preference.

Question 6c.

Marks	0	1	2	Average
%	35	36	29	1

The HACCP system is important in the production of the M^{c}Cain Pizza Subs as it is a food safety plan that will identify any potential food hazards and areas of high risk or 'critical control points' during the production of the pizzas.

To gain two marks, students must have provided more than a simple statement such as 'HACCP is a food safety plan'. Students needed to explain a reason to achieve full marks.

Following is an example of a good response to this question.

> *HACCP identifies the risks that could affect food production and the final product. The plan sets the critical limits and these are used when each point is monitored. The system is used to minimise hazards occurring and increase safety in production and the products produced.*
>
> *OR*
>
> *HACCP is a food safety system that identifies any risks involved in the production of the pizzas and prevents them from occurring. If problems do arise, information is provided on what to do. HACCP protects the health and safety of both consumers and manufacturers.*

Question 6di–ii.

Marks	0	1	2	3	4	Average
%	10	7	25	27	31	2.6

Suitable answers could have included any one hazard and any one safety practice from the following table.

Stage	Hazard	Safety practice
delivery of the raw ingredients	• delivery of raw ingredients that are not fresh or are contaminated • ingredients may be delivered that are past their use-by or best-before date • food items may not be delivered in a registered food delivery vehicle	• all ingredients must be checked on delivery to ensure that they are fresh and that the packaging is not damaged, leading to contamination of food • all ingredients must be checked on delivery to ensure that they are within their use-by or best-before date and that the packaging is not damaged • check the food delivery vehicle to ensure it is registered for the delivery of food • use a food thermometer to check that the food has been stored below the 'danger zone' during transport and delivery
storage of the raw ingredients	ingredients are not stored in optimum conditions and may be contaminated	• check that the thermometer of the refrigerator is in good working order

		• take a temperature check of the refrigerator daily • perishable ingredients such as meat and cheese for the pizza must be refrigerated • dry ingredients such as flour should be stored in an airtight container in a cool, dry environment above the floor
cooking the pizzas	• the pizzas may be undercooked or cooked at too low a temperature • oven is clean • oven may malfunction	• check that the thermometer and timer on the oven are accurate and in good working condition • ensure that staff are knowledgeable about the cooking time of the pizza and pizzas are tested to determine degree of 'doneness' • check that the oven is clean to prevent contamination by bacteria • ensure that the oven is serviced regularly and that staff are well trained in the use of the oven
packaging and storage of the pizzas	• the pizzas are not packaged immediately and are exposed to contamination • the pizzas are left in the 'danger zone' after cooking	• ensure that the pizzas are packaged as soon as possible after cooking • pizzas should be chilled or frozen immediately to ensure that they are kept at a temperature below the 'danger zone' to prevent food spoilage or food contamination

Students needed to nominate a temperature of below 4°C or above 60°C or use the term 'danger zone'. A statement that food should be kept at a 'safe' temperature did not demonstrate sufficient knowledge.

Question 6e–f.

Marks	0	1	2	3	4	Average
%	12	17	26	26	19	**2.2**

Food spoilage is when the chemical and physical properties of the food deteriorate and the food loses quality. The food is not usually harmful. For example, the cheese may become mouldy, the onions can become soft and have a distinctive 'off' odour, the capsicum will become limp and have a slimy feel on the surface, the wheat flour may show signs of weevil infestation or a slimy, white film can appear on the surface of the olives.

Students needed to include an explanation of how one of the listed ingredients could be affected by food spoilage to achieve full marks.

AND

Food poisoning is the contamination of foods by harmful bacteria when ingested that may cause illness or even death.
OR
Food poisoning is an illness that occurs after eating food that is contaminated with bacteria.

Question 7a.

Marks	0	1	2	3	Average
%	28	11	23	38	**1.7**

Marketing strategies included:

- free samples – giving out free samples of products may encourage people to taste a product they would not normally buy. The samples are free so people are likely to try them
- letterbox drop – reaches many more people by delivering the product to consumers' homes. The product gets to the whole family, not just the person doing the shopping
- use of media – television or radio advertisements provide listeners and viewers with information about the product (for example, nutrient content, where to purchase the product, cost)
- billboards/flyers – has a wide audience as consumers will see billboards as they drive to work/school; flyers will get into every home so both parents and children will see the new product and be tempted to buy it
- promotional campaigns – two for one, buy one get one free. These campaigns encourage people who are price conscious, especially parents of young children, to purchase a new product, as it is less expensive especially if it is combined with another well recognised product such as a muesli bar.

Question 7b.

Marks	0	1	2	Average
%	63	19	19	**0.6**

Ethical considerations could have included any of:

- no exaggerated claims or deceptive images on the packaging
- no deceptive advertising or misleading performance claims
- should not be advertised during prime time children's television as the drink may be considered a 'junk food' due to the high sugar content.

Many students misread 'ethical' as 'ethnic'. This question was very poorly done.

Following is an example of a good response.

Claims of the vitamin content or sugar content must realistically reflect the real content of the drink. Fake representations can manipulate buyers and they buy something with the belief that it is providing benefits and the drink could lead to poor dental health. The marketing must not be misleading or deceptive. The description of the product must be accurate and photographs must be realistic.

Question 7c.

Marks	0	1	2	Average
%	20	32	48	**1.3**

One purpose of packaging could have been any of the following:

- containment: for easier handling and transportation
- protection: to ensure good condition
- preservation: to reduce the rate of spoilage and decomposition
- communication: to communicate messages to the consumer
- convenience: portion control, preparation, easier storage, dispensing, for example, a spout.

Question 7d.

Marks	0	1	2	3	4	Average
%	8	1	7	11	73	**3.4**

Types of information that must legally appear on packaging could have included the following.

Labelling requirement	Explanation
Name of food	Enables consumers to identify the product – it must not be misleading
Identification of packaging premises and job lot	Assists consumers and health authorities in case of recall
Name and address of business	Enables consumers to make direct contact with the manufacturer if required
Mandatory warning and advisory information	Identifies ingredients likely to harm health, for example, aspartame, phytosterol esters, unpasteurised egg products
List of ingredients	Must be listed in descending order by ingoing weight so that consumers can identify specific ingredients and make comparisons if desired
Food additives	Listed by class so consumers can identify any likely allergic reaction
Declaration of the presence of potential allergens in food	Must identify those ingredients likely to trigger an allergic reaction, for example, nuts, milk, egg, gluten
Declaration of the presence of any genetically modified material that has been added to the food	To inform consumers and enable them to make an informed choice
Use-by or best-before date	Indicates optimal quality
Health and safety advice	Protects consumer health by providing directions relating to the storage of product
Nutrition information panel	Enables consumers to make informed choices

Labelling requirement	Explanation
Percentage of the characterising ingredient of the food	Allows comparison for quality or value
Country of origin	The consumer is able to determine the source of the product
Weight or measure of contents – the metric unit of measure must be used, including NET weight	The minimum weight must be declared to enable consumers to compare products

Students needed to identify two types of information that must legally appear on packaging and an explanation of why each is required by law.

Question 7e.

Marks	0	1	2	Average
%	59	19	23	**0.7**

Aseptic packaging involves independently sterilising both the food and the packaging and then performing the filling and sealing operation in a sterile environment.

Students needed to include the three sterile features of this type of packaging: food, packaging and environment.