

2020 HSC Food Technology Marking Guidelines

Section I

Multiple-choice Answer Key

Question	Answer
1	A
2	D
3	B
4	A
5	D
6	B
7	A
8	C
9	D
10	D
11	B
12	C
13	D
14	C
15	C
16	A
17	D
18	A
19	B
20	C

Section II

Question 21 (a)

Criteria	Marks
<ul style="list-style-type: none"> Correctly identifies the sector 	1

Sample answer:

Answer will depend on which organisation has been named.

Local bakery X belongs to the Food Retail sector of the AFI as it sells food items to consumers.

Question 21 (b)

Criteria	Marks
<ul style="list-style-type: none"> Provides characteristics and features of how the chosen organisation has responded to consumer demand for convenience foods 	3
<ul style="list-style-type: none"> Sketches in general terms how the chosen organisation has responded to consumer demand for convenience food(s) 	2
<ul style="list-style-type: none"> Provides relevant information on convenience foods 	1

Sample answer:

Consumer demand for convenience foods has increased due to the busy lifestyle of many individuals, changing household structures and the health concerns of consumers. For example supermarkets now sell fresh meals ready to reheat. These types of foods require minimal preparation or cooking skills from the consumer.

Question 22 (a)

Criteria	Marks
<ul style="list-style-type: none"> Sketches in general terms TWO causes of food spoilage 	3
<ul style="list-style-type: none"> Sketches in general terms ONE cause of food spoilage 	2
<ul style="list-style-type: none"> Provides some relevant information 	1

Sample answer:

Fresh and processed foods can be spoiled by physical damage. Fresh food like fruit can be bruised or crushed. Processed foods can be dropped or dented. Meats can become slimy due to micro-organism action, or mould can grow on bread.

Answers could include:

- Environmental factors ie temperature, moisture, humidity, sunlight
- Insects and pests
- Enzymes
- Microbial ie bacteria, mould, yeast.

Question 22 (b)

Criteria	Marks
<ul style="list-style-type: none"> Provides the cause and effect for TWO reasons manufacturers preserve food 	4
<ul style="list-style-type: none"> Provides characteristics and features for TWO reasons manufacturers preserve foods 	3
<ul style="list-style-type: none"> Sketches in general terms a reason(s) manufacturers preserve foods 	2
<ul style="list-style-type: none"> Provides relevant information 	1

Sample answer:

Food manufacturers preserve food to keep it safe for consumption and free from microbial action, for example with canned tomatoes. Preserving food also makes food available all year round, for example, dried apricots are available out of season.

Answers could include:

- Acceptability to consumers, eg preserving food before it decomposes because of enzymatic action eg canned apples
- Nutritive value, eg freezing vegetables to lock in their nutrients eg frozen peas
- Economic viability, eg manufacturers developing new products eg frozen meals

Question 22 (c)

Criteria	Marks
<ul style="list-style-type: none"> Shows the cause and effect of the principles behind one food preservation technique Provides an example of a relevant food product 	5
<ul style="list-style-type: none"> Provides characteristics and features of the principles behind one food preservation technique Provides an example of a relevant food product 	4
<ul style="list-style-type: none"> Sketches in general terms a principle(s) behind one food preservation technique <p>AND/OR</p> <ul style="list-style-type: none"> Provides an example of a relevant food product 	2–3
<ul style="list-style-type: none"> Provides relevant information 	1

Sample answer:

The shelf life of a tomato can be extended by the technique of canning. Canning uses two principles of preservation to extend shelf life. Air is removed from the can, then the can is sealed. High temperatures are used to destroy any microbes inside the can. The can's seal prevents re-entry of both microbes and air which therefore extends the shelf life of the product. Without the process of canning, a tomato would start to decompose from enzymatic action.

Question 23 (a)

Criteria	Marks
• Correctly states meaning of active non-nutrient	2
• Provides relevant information	1

Sample answer:

Substances that are not essential to life but have health benefits that can enhance the functioning of the body.

Question 23 (b)

Criteria	Marks
• Provides detailed characteristics and features of the health benefits of the product	5
• Provides characteristics and features of the health benefit(s) of the product	4
• Sketches in general terms the health benefit(s) of the product	2–3
• Provides relevant information	1

Sample answer:

The product will have many positive health benefits for the consumer. As it is a shelf-stable product it will have a long shelf life reducing the risk of spoilage and contamination so consumers will not get sick. As it is dairy-free, this product is suitable for consumers who are lactose intolerant. They won't suffer from digestive issues eg diarrhoea, meaning their body will have more time to absorb the other nutrients. The probiotic is positive for consumers wanting improved gut health.

Question 24 (a)

Criteria	Marks
• Sketches in general terms ONE government policy that affects the Australian food industry	2
• Provides relevant information	1

Sample answer:

Government policy, such as Trade policy, that promotes trade agreements provides opportunities for business entering foreign markets, expanding their market and improving their profitability.

Question 24 (b)

Criteria	Marks
<ul style="list-style-type: none"> Provides characteristics and features of how government legislation influences Australian food manufacturers' decisions 	3
<ul style="list-style-type: none"> Sketches in general terms how government legislation influences Australian food manufacturers' decisions 	2
<ul style="list-style-type: none"> Provides relevant information 	1

Sample answer:

Government legislation such as the Workplace Health and Safety Act influences the procedures manufacturers implement in their workplace. It may affect how close machines are to each other and the level of automation used, and this may lead manufacturers to invest more capital in the training and safety of employees.

Answers could include:

- Food Standards Code – ingredient choice, labelling
- Protection of the Environment Operations Act – management of waste on site
- Food Act (NSW) – environmental hygiene set-up and procedures within the organisation.

Question 24 (c)

Criteria	Marks
<ul style="list-style-type: none"> Clearly shows the relationship between external factors and the implication they have for food product development in the Australian food industry 	6
<ul style="list-style-type: none"> Provides characteristics and features of external factor(s) that affect food product development in the Australian food industry 	4–5
<ul style="list-style-type: none"> Sketches in general terms how external factor(s) affect food product development in the Australian food industry 	2–3
<ul style="list-style-type: none"> Provides relevant information 	1

Sample answer:

The macro-environment, which surrounds business directly, affects food product development within Australia. The economic environment affects food product development, for example in times of recession, food product development slows, especially for luxury food items. If interest rates are high, companies may not invest money into developing new foods, as they will need to repay loans. Manufacturers also want stability in the political environment so that they can make long-term investments. If a new food product is developed for export, manufacturers need consistency in trade to ensure financial returns. They may also want certainty that they can access the research and development rebate from the government.

Question 25 (a)

Criteria	Marks
• Correctly recognises and names types of market research undertaken during the development of a food product	2
• Provides relevant information	1

Sample answer:

- Surveys/questionnaires
- Existing products
- Consumer trends
- Taste testing.

Question 25 (b)

Criteria	Marks
• Provides reasons for testing product prototypes in the development of food products	3
• Provides a reason for testing product prototypes in the development of food products	2
• Provides relevant information	1

Sample answer:

Testing product prototypes enables developers to assess taste and textural qualities of the food and see what changes are needed. Prototype testing also enables storage trials of the product to take place; this assists with labelling and packaging designs.

Answers could include:

- Ensuring waste minimisation
- Ensuring product consistency
- Obtaining feedback from target market.

Question 25 (c)

Criteria	Marks
• Makes evident a relationship between nutrient intake and a dietary disorder	5
• Provides characteristics and features of nutrient intake and a dietary disorder	4
• Sketches in general terms about nutrient intake and a dietary disorder	2–3
• Provides relevant information	1

Sample answer:

Cardiovascular disease: carbohydrate and fat intake contribute significantly to the incidence of cardiovascular disease. Overconsumption of carbohydrates and energy foods contribute to obesity which places stress on the heart. A diet high in saturated fat increases the amount of low-density lipoproteins (LDLs) present in the body. These contribute to the build-up of cholesterol/plaque in the blood vessels, leading to higher blood pressure.

Question 26

Criteria	Marks
• Makes evident a relationship between quality management in food manufacture and computerised production systems	5–6
• Provides characteristics and features of quality management in food manufacture and/or computerised production systems	3–4
• Sketches in general terms information about quality management in food manufacture and/or computerised production systems	2
• Provides relevant information	1

Sample answer:

A computerised production system is an automated system that uses sensors to perform complex operations, store data and keep records required for quality management systems. These system features can be used to monitor critical control points in a production process according to set critical limits and record results. The sensors allow the computerised equipment to respond with corrective actions when limits are reached. Computerised production systems also control and monitor machine and worker performance, measuring devices, quality standards, production efficiency and product safety throughout the production process.

Section III

Question 27 (a)

Criteria	Marks
<ul style="list-style-type: none"> • Sketches in general terms an appropriate target market for the given product 	2
<ul style="list-style-type: none"> • Names an appropriate target market 	1

Sample answer:

An appropriate target market for this product would be a person who suffers from constipation as the food is high in fibre. Fibre helps to reduce the risk of constipation and helps to make bowel movements regular.

Answer could include:

- Vegans
- Individuals with heart disease
- Individuals with diabetes.

Question 27 (b)

Criteria	Marks
<ul style="list-style-type: none"> • Puts forward a detailed and suitable marketing plan for the launch of this product • Provides a detailed range of strategies 	5
<ul style="list-style-type: none"> • Puts forward a suitable marketing plan for the launch of this product • Provides strategies 	4
<ul style="list-style-type: none"> • Sketches in general terms a marketing plan for the launch of this product • Provide a strategy(ies) 	2–3
<ul style="list-style-type: none"> • Provides some relevant information 	1

Sample answer:

A marketing plan developed to launch this product would include a range of different strategies to reach and interest the target market. Strategies would include the use of a range of media and sales promotions to create awareness of the product in the marketplace and introductory pricing measures to entice purchase.

The manufacturing company would use a combination of the following strategies. Advertising would occur by the use of print and digital media. The food manufacturer may purchase advertising space on buses, billboards near gyms/health facilities and in relevant health magazines. Personal selling strategies would include demonstrators in supermarkets and health food stores where they will offer customers a taste test of the product and generally are located close to where the product is found in the store to encourage sales. Direct marketing through the use of social media to online group pages, specific social media platforms and general pop-up advertising on these sites.

Pricing structures to encourage consumers to purchase the product through the use of introductory offers such as discounted pricing for a limited time during the launch of the product. Sponsorship of specific events for health campaigns and community activities.

Question 27 (c)

Criteria	Marks
<ul style="list-style-type: none"> • Demonstrates a clear understanding and shows a relationship between the benefits of and reasons for moving towards plant-based diets 	7–8
<ul style="list-style-type: none"> • Provides characteristics and features of the benefits of moving towards a plant-based diet 	5–6
<ul style="list-style-type: none"> • Sketches in general terms the benefit/s of plant-based diets 	3–4
<ul style="list-style-type: none"> • Provides relevant information 	1–2

Sample answer:

This product would provide a number of holistic benefits for both an individual and society if Australians chose to consume it.

As the product is low in cholesterol it would be beneficial for individuals who suffer from high cholesterol, heart disease or who have a history of heart disease in their family. Cholesterol will cause blockages in the arteries around the heart. When it builds up and causes a blockage it may cause an individual to suffer a heart attack. Plant-based products are low in LDL cholesterol and often contain HDL cholesterol. This therefore can reduce the build-up of LDL cholesterol in the arteries preventing high blood pressure and the risk from clots.

The product is high in fibre and this can help to reduce a range of diseases and illnesses for an individual. A lack of fibre causes constipation and it can also cause diverticulitis and bowel cancer. The high fibre in the product is able to absorb fat and cholesterol to prevent them being absorbed into the body. Fibre holds water and increases the removal of wastes from the body. Fibrous plant foods grown by farmers could be diversified as the land would not be needed for livestock production.

As the product is high in protein it can provide a lot of nutritional benefits. It would add to the satiety of the individual which is beneficial for those wanting to lose weight. It also provides amino acids to repair the body.

Increased plant-based food production while reducing livestock production would see a lowering in Australia's carbon emissions. Farmers could allow land to recover naturally as fewer grazing crops and lands would be needed. Grains and legumes would be more plentiful as they would not be needed to feed animals. Low-income families would be able to afford staples more easily.

Section IV

Question 28

Criteria	Marks
<ul style="list-style-type: none"> Clearly demonstrates the effectiveness of the relationship between developments in packaging and consumer demands for convenience and concerns about the environment Provides a cohesive and logical response with use of appropriate terminology Provides a range of relevant examples 	13–15
<ul style="list-style-type: none"> Demonstrates the effectiveness of the relationship between developments in packaging and consumer demands for convenience and concerns about the environment Provides a cohesive and logical response with use of appropriate terminology Provides relevant examples 	10–12
<ul style="list-style-type: none"> Provides characteristics and features of the development/s in packaging in relation to consumer demand/s for convenience and/or concerns about the environment Provides example(s) 	7–9
<ul style="list-style-type: none"> Sketches in general terms development/s in packaging in relation to consumer demand(s) for convenience and/or concerns for the environment 	4–6
<ul style="list-style-type: none"> Provides relevant information about packaging or consumer demands or concerns for the environment 	1–3

Sample answer:

Food manufacturers are constantly trying to improve their products to meet consumer demands. Consumers want food products that provide them with convenience and show concern for the environment. Food manufacturers are addressing these concerns through their developments in packaging.

Many food manufacturers have replaced plastic packaging with paper/cardboard and plant-based packaging. This is a positive change for the environment as paper and cardboard packaging is biodegradable and this means it will break down and not end up in landfill, eg the move from non-recyclable waxed paper packaging to recyclable paper packaging, bamboo disposable containers, cutlery for takeaway; starch-based plastic alternatives which are biodegradable.

Some food packaging sizes have been reduced to provide convenient portioning for consumers however this has led to an increase in packaging used. Consumers concerned about excessive packaging also have the option of purchasing family/bulk containers of products such as yoghurt to reduce the single use packaging.

The thickness of plastics and number of layers or double packaging has been reduced. This has a positive impact on the environment as landfill wastage is less, eg bottled water is now packaged in thinner plastics with recycled plastics being used in the container.

Some products that were packaged in styrofoam have been replaced with corrugated cardboard, eg cups for noodles, coffee. The corrugated cardboard is a biodegradable packaging type whereas styrofoam is not. These provide another benefit to the environment.

Answers could include:

- Retort pouches and aseptic packaging
- MAP, active and intelligent packaging
- Microwavable packaging
- Eating implements provided within packages
- Resealable and tamper-proof packaging
- Gel packs/cooling bricks for delivered meals.

2020 HSC Food Technology Mapping Grid

Section I

Question	Marks	Content	Syllabus outcomes
1	1	AFI – Sector of AFI	H1.2
2	1	FPD – Types of FPD – line extensions	H1.3
3	1	NUT – Nutritional needs of specific groups	H2.1
4	1	FPD – Drivers	H1.3
5	1	AFI – Value added foods	H1.2
6	1	FPD – Steps in FPD	H1.3
7	1	FPD – SWOT	H1.3
8	1	AFI – Quality assurance in AFI	H1.2
9	1	AFI – Emerging technology in AFI	H1.2
10	1	FM – Food additives	H1.1
11	1	FPD – Price structures (4Ps)	H1.3
12	1	AFI – Career opportunities AFI	H1.2
13	1	NUT – Promotion of health – government organisation	H2.1
14	1	FM – Preservation	H4.2
15	1	FM – Raw materials in food manufacture	H1.1
16	1	NUT – Economic costs of malnutrition	H2.1
17	1	NUT – Dietary supplements	H2.1
18	1	FM – Storage conditions in food manufacture	H1.1
19	1	FM – Causes of food deterioration	H4.2
20	1	NUT – Phytochemicals	H2.1

Section II

Question	Marks	Content	Syllabus outcomes
21 (a)	1	AFI – Identify sector of AFI	H1.4
21 (b)	3	AFI – Consumer demands	H1.4
22 (a)	3	FM – Causes of food spoilage	H4.2
22 (b)	4	FM – Reasons for preserving foods	H4.2
22 (c)	5	FM – Principles of preservation	H4.2
23 (a)	2	NUT – Active non-nutrients	H2.1
23 (b)	5	NUT – Health benefits of active non-nutrients	H2.1
24 (a)	2	AFI – Government policy	H1.2
24 (b)	3	AFI – Impact of government legislation	H1.2
24 (c)	6	FPD – External factors	H1.3
25 (a)	2	FPD – Market research	H4.1
25 (b)	3	FPD – Testing prototype	H4.1
25 (c)	5	NUT – Dietary disorders	H2.1
26	6	FM – Production systems and quality assurance	H1.1

Section III

Question	Marks	Content	Syllabus outcomes
27 (a)	2	FPD – Target markets	H1.3
27 (b)	5	FPD – Marketing plan	H1.3
27 (c)	8	NUT – Nutritionally modified foods – benefits	H2.1

Section IV

Question	Marks	Content	Syllabus outcomes
28	15	FM – Developments in packaging	H1.1, H1.3