



ATAR course examination, 2017

Question/Answer booklet

FOOD SCIENCE AND TECHNOLOGY

Please place your student identification label in this box

Student number: In figures

--	--	--	--	--	--	--	--

In words

Time allowed for this paper

Reading time before commencing work: ten minutes

Working time: three hours

Materials required/recommended for this paper

To be provided by the supervisor

This Question/Answer booklet

Multiple-choice answer sheet

Number of additional
answer booklets used
(if applicable):

To be provided by the candidate

Standard items: pens (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters

Special items: non-programmable calculators approved for use in this examination

Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised material. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of examination
Section One Multiple-choice	15	15	15	15	15
Section Two Short answer	8	8	95	87	55
Section Three Extended answer	3	2	70	40	30
Total					100

Instructions to candidates

- The rules for the conduct of the Western Australian external examinations are detailed in the *Year 12 Information Handbook 2017*. Sitting this examination implies that you agree to abide by these rules.

- Answer the questions according to the following instructions.

Section One: Answer all questions on the separate Multiple-choice answer sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Sections Two and Three: Write your answers in this Question/Answer booklet.

- You must be careful to confine your answers to the specific questions asked and to follow any instructions that are specific to a particular question.
- Supplementary pages for the use of planning/continuing your answer to a question have been provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Section One: Multiple-choice**15% (15 Marks)**

This section has **15** questions. Answer **all** questions on the separate Multiple-choice answer sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

Suggested working time: 15 minutes.

1. The browning of starchy foods when exposed to dry heat is caused by
 - (a) dextrinisation.
 - (b) aeration.
 - (c) caramelisation.
 - (d) emulsification.

2. A food company uses quantitative research methods to
 - (a) transform data into usable statistics.
 - (b) associate choices with feelings.
 - (c) gain an understanding of personal opinions.
 - (d) provide insights into the emotional aspects of the proposed product.

3. Food manufacturers value-add to
 - (a) analyse a product for sale.
 - (b) increase the selling price.
 - (c) make food safe to sell.
 - (d) destroy disease-causing bacteria.

4. Antioxidants may promote health by
 - (a) acting in a function similar to the human hormone oestrogen.
 - (b) stimulating the growth of beneficial bacteria in the gut.
 - (c) preventing damage to body cells by scavenging free radicals.
 - (d) reducing the level of cholesterol in the blood.

5. Nutrient Reference Values are
 - (a) the amounts of food, food groups and dietary patterns that aim to promote health.
 - (b) dietary diseases that contribute to the burden of illness in the Australian population.
 - (c) the proportion of the five food groups recommended for consumption each day.
 - (d) recommendations for nutritional intake based on available scientific knowledge.

See next page

6. The functional properties that determine the formation of an egg white foam include
- (a) gelatinisation, emulsification and denaturation.
 - (b) aeration, leavening and emulsification.
 - (c) coagulation, denaturation and aeration.
 - (d) gelatinisation, coagulation and leavening.
7. The effect of soil erosion, salinity and soil pollution on production of food in Australia
- (a) impacts climate change.
 - (b) reduces trade restrictions.
 - (c) reduces potential productivity.
 - (d) impacts population growth.
8. The primary purpose of the national health priority areas is to
- (a) increase government funding to Australian hospitals.
 - (b) reduce the burden of disease in Australia.
 - (c) increase the intake of fruit and vegetables in Australia.
 - (d) reduce the impact of food advertising on Australian children.
9. The technology process is the
- (a) use of skills, equipment and food to meet consumers' needs through improvement or altering of products.
 - (b) identification of a situation, need or event that requires a food product to be created.
 - (c) assessment of the nature and circumstances of a problem or need or solution.
 - (d) series of steps taken to solve problems that involves developing ideas and creating solutions.
10. Food imports into Australia are directly affected by
- (a) embargoes and subsidies.
 - (b) the share market and tariffs.
 - (c) interest rates and subsidies.
 - (d) the share market and embargoes.
11. Diabetes is a health condition in which the
- (a) pancreas does not produce insulin.
 - (b) muscles use too much blood sugar.
 - (c) body makes more insulin than needed.
 - (d) liver produces too much insulin.

12. A functional food that may help to control blood glucose levels is
- (a) soy.
 - (b) flaxseeds.
 - (c) kale.
 - (d) whole grains.
13. A product proposal for a new food product is **best** based on
- (a) qualitative analysis, product specification, customer feedback.
 - (b) consumer profile, product purpose, product specification.
 - (c) product prototype, quantitative analysis, consumer profile.
 - (d) product purpose, customer feedback, product prototype.
14. The properties of raw food are affected by
- (a) research into product development.
 - (b) ingredients supplied from international importers.
 - (c) processing techniques used by food producers.
 - (d) healthy eating practices of consumers.
15. Increased awareness of diet in promoting health has led to consumers choosing foods with
- (a) reduced sugar content, increased kilojoules and increased wholegrain content.
 - (b) increased wholegrain content, increased vegetable content and reduced sugar content.
 - (c) increased kilojoules, reduced fat and reduced salt content.
 - (d) reduced fat, increased kilojoules and increased vegetable content.

End of Section One

See next page

Section Two: Short answer**55% (87 Marks)**

This section has **eight (8)** questions. Answer **all** questions. Write your answers in the spaces provided.

Supplementary pages for the use of planning/continuing your answer to a question have been provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 95 minutes.

Question 16**(10 marks)**

- (a) Name the State legislation that ensures food sold in Western Australia is safe for human consumption. (1 mark)

Jason has been complimented on his cooking skills. He has decided to make his favourite chicken sushi recipe, given below, to sell at the local farmers' market that runs every Sunday, close to his home. Jason plans to implement the principles of the Hazard Analysis Critical Control Point system to ensure that he provides safe food for his customers.

Chicken Sushi

Ingredients	Method
2 cups cooked sushi rice 1 tablespoon rice wine vinegar 2 teaspoons caster sugar 2 nori sheets 1 tablespoon mayonnaise ½ Lebanese cucumber ½ avocado, sliced ½ medium carrot 200 g chicken 2 tablespoons teriyaki sauce soy sauce, to serve	1. Marinate chicken in teriyaki sauce. 2. Heat a frying pan over medium heat and cook chicken. Once cooked, cut into strips and allow to cool. 3. Cut carrot and Lebanese cucumber into matchstick-shaped pieces. 4. Place rice wine vinegar and sugar in a microwave-safe jug. Microwave for 30 seconds. Stir to dissolve sugar. Transfer rice to a large bowl. Using a spatula, stir to break up lumps. Slowly add vinegar mixture, stir until rice has cooled. 5. Place 1 nori sheet, shiny-side down, on a sushi mat. Using damp fingers, spread 1 cup of rice over the nori, leaving a 2 cm strip at one end. 6. Spread 2 teaspoons of mayonnaise over the centre of the rice. 7. Arrange half of the cucumber, avocado, carrot and chicken over the mayonnaise. 8. Using the sushi mat, roll up firmly to form a roll. 9. Cut into 6 slices. Repeat with other nori sheet. 10. Package chicken sushi and soy sauce for market.

See next page

- (b) Identify **two** potential critical control points in the production and sale of the chicken sushi, explaining **one** way of controlling each of them. (6 marks)

Critical control point	Explanation
One: _____	_____ _____ _____ _____
Two: _____	_____ _____ _____ _____

- (c) The farmers' market is open from 9 am to 1 pm. Explain a monitoring requirement Jason will need to implement during the sale of the chicken sushi. (3 marks)

Question 17

(12 marks)

Rashid is cooking a two-course meal of spaghetti and meatballs and sticky date pudding with custard, for his family of four people. He has listed the ingredients from his favourite recipes below. In order to keep within the weekly food budget, he needs to cost the meal.

Each recipe serves four people.

Spaghetti and Meatballs – Ingredients	Sticky Date Pudding with Custard – Ingredients
250 g spaghetti pasta	125 g pitted dates
½ teaspoon salt	½ teaspoon bicarbonate of soda
1 teaspoon dried rosemary	¾ cup boiling water
2 tablespoons breadcrumbs	60 g butter
1 teaspoon Dijon mustard	90 g brown sugar
400 g beef mince	½ teaspoon vanilla essence
1 teaspoon dried oregano	1 egg
1 egg	100 g self-raising flour
pinch sea salt	2 egg yolks
freshly ground black pepper	2 teaspoons cornflour
1 tablespoon olive oil	1 cup milk
1 medium onion	20 g caster sugar
1 clove garlic	½ teaspoon vanilla essence
2 teaspoons balsamic vinegar	
400 g tinned tomatoes	
50 g Parmesan cheese	

On a supermarket website, Rashid located the information below:

Ingredient	Size of package	Cost \$	Ingredient	Size of package	Cost \$
Beef mince	500 g	5.00	Eggs	1 dozen	6.60
Olive oil	1 L	17.50	Onions	6	2.10
Tomatoes, tinned	800 g	1.50	Spaghetti pasta	500 g	2.00
Pitted dates	500 g	1.80	Butter	500 g	3.60
Brown sugar	1 kg	2.40	Vanilla essence	200 ml	2.40
Self-raising flour	1 kg	2.80	Parmesan cheese	1 kg	24.40
Milk	2 L	2.96	Caster sugar	1 kg	3.50

See next page

- (a) Complete the table below that collates the recipes and costs the meal per serve for Rashid’s family. Some of the items have been done for you. (8 marks)

Ingredients required	Quantity	Cost \$
spaghetti pasta	250 g	1.00
beef mince	400 g	4.00
eggs		
olive oil	1 tablespoon	
onion	1	0.35
tinned tomatoes	400 g	0.75
Parmesan cheese	50 g	1.22
pitted dates	125 g	0.45
butter	60 g	0.43
brown sugar	90 g	0.22
vanilla essence		
self-raising flour	100 g	0.28
milk		
caster sugar	20 g	0.07
Pantry items: garlic, dried herbs, Dijon mustard, salt, sea salt, black pepper, bicarbonate of soda, cornflour, balsamic vinegar, breadcrumbs		2.00
Total cost		
Cost per serve for Rashid’s family (rounded to nearest cent)		

- (b) Rashid’s sister has brought two friends home for dinner. Make and justify **two** adaptations that could be made to the recipes to feed the two extra people without increasing the cost of the meal significantly. (4 marks)

One: _____

Two: _____

Question 18

(14 marks)

- (a) Explain how the *Occupational Safety and Health Act 1984* safeguards both employers and employees. (6 marks)

Employers: _____

Employees: _____

- (b) Ali had been working for two days as a kitchen hand in a busy kitchen. Her supervisor asked her to prepare the cold meats, using the meat-slicing machine. Ali's supervisor had not yet arranged training for her to use the meat slicer. Although Ali knew she did not have the training to use the machine, she felt that she could not say no to her supervisor because the kitchen was busy and there was no one else to do the task.

The machine started to go too fast for Ali and she could not see the emergency cut-off switch. As the machine guard was not attached, the blade cut off the top of Ali's finger.

Describe **one** social and **one** economic consequence of the unsafe work environment for both Ali and her employer. (8 marks)

Social consequence	Ali
	Ali's employer
Economic consequence	Ali
	Ali's employer

See next page

Question 19

(6 marks)

Describe how **each** of the following factors influences health and wellbeing:

- gender
- race
- family history.

Gender: _____

Race: _____

Family history: _____

Question 20**(11 marks)**

Environmental conditions influence the sustainable production of food commodities. Agricultural practices that worked in the past are not always effective and are constantly being reviewed to ensure the sustainability of food production in Australia.

- (a) Identify **one** farming practice used in Australia and describe **two** impacts it has on the sustainability of food production in Australia. (5 marks)

Farming practice: _____

One: _____

Two: _____

- (b) Identify **two** water availability concerns in Australia and describe strategies to manage water availability to ensure sustainable food production. (6 marks)

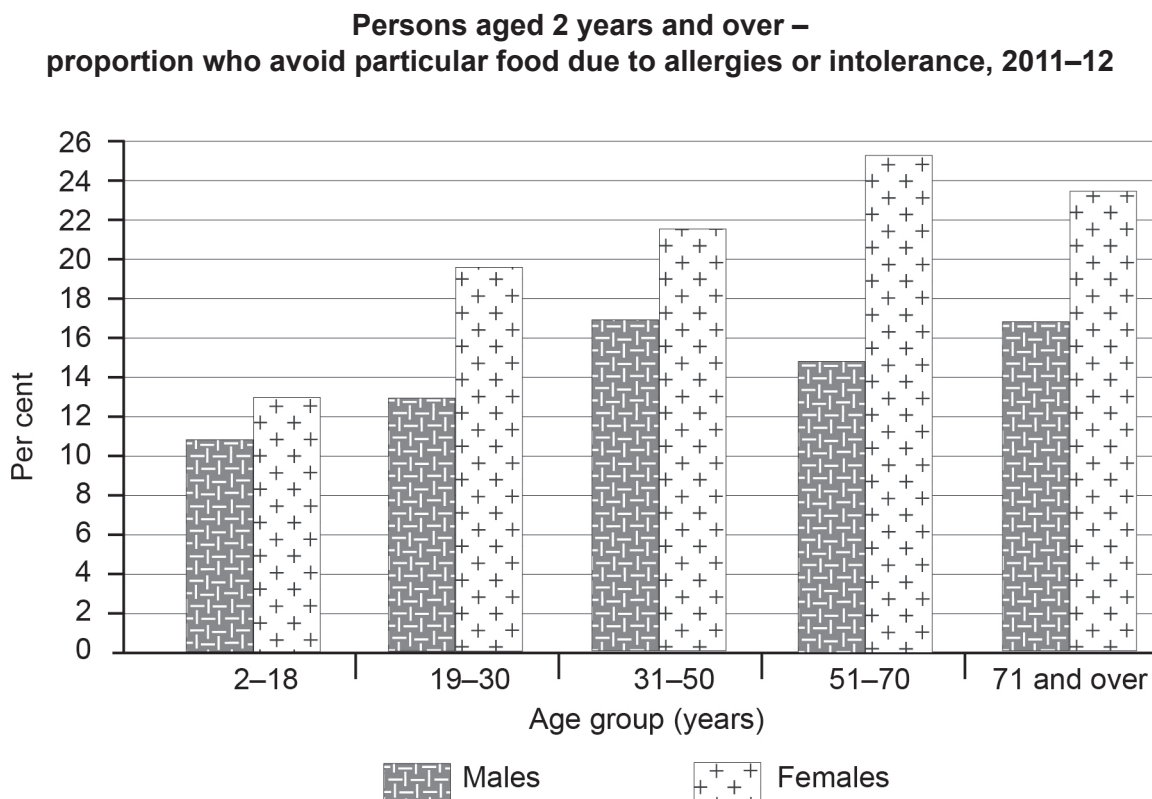
One: _____

Two: _____

Question 21

(12 marks)

- (a) Identify **two** trends indicated by the data below. Provide a possible reason for each trend. (4 marks)



One: _____

Two: _____

(b) Describe each of the following conditions:

- lactose intolerance
- coeliac disease.

(4 marks)

Lactose intolerance: _____

Coeliac disease: _____

Question 21 (continued)

Beef lasagne is a menu item for a function. The function organisers are aware that some guests are lactose intolerant and two have coeliac disease. The chef has asked you to modify the ingredients, given below, used for his beef lasagne recipe, to cater for the guests who are lactose intolerant and the two who have coeliac disease.

Beef Lasagne – Ingredients

4 dried lasagne sheets
4 tablespoons tasty cheese

Bolognese Sauce
2 teaspoons olive oil
½ onion
½ carrot
½ stick celery
1 garlic clove
250 g beef mince
2 tablespoons tomato paste
½ cup tinned chopped tomatoes
½ cup liquid chicken stock
¼ teaspoon dried oregano
pinch ground nutmeg

White Sauce
30 g butter
30 g plain flour
250 ml full cream milk

(c) Complete the table below.

(4 marks)

Condition	Ingredients to be modified – with suitable modification
Lactose intolerant	
Coeliac disease	

See next page

Question 22

(13 marks)

Lachlan works in an office and has been trying to follow a more nutritious diet. He has started taking his lunch to work rather than buying takeaway. One of his favourite lunches is ham, cheese and salad in a white bread roll.

- (a) Identify the macronutrients found in the ham, cheese, salad and white bread roll. (3 marks)

- (b) Describe **two** phases of mechanical and **three** phases of chemical digestion of the white bread roll. (10 marks)

Mechanical digestion: _____

Chemical digestion: _____

Question 23**(9 marks)**

Advertising is a powerful tool used by businesses to persuade and inform consumers to desire a product and want to purchase it.

- (a) Explain the purpose of the *Australian Association of National Advertisers (AANA) Code for Advertising and Marketing Communications to Children*. (3 marks)

- (b) Describe **three** Codes of Practice contained in the *AANA Code for Advertising and Marketing Communications to Children*. (6 marks)

One: _____

Two: _____

Three: _____

End of Section Two

See next page

Section Three: Extended answer**30% (40 Marks)**

This section contains **three (3)** questions. Answer **two (2)** questions only. Write your answers in the spaces provided following Question 26.

Supplementary pages for the use of planning/continuing your answer to a question have been provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 70 minutes.

Question 24**(20 marks)**

- (a) Define genetic modification and identify **one** way in which it is used in food production. (2 marks)
- (b) Explain **two** possible risks of the genetic modification of food. (6 marks)
- (c) Identify **three** technologies used to develop new food products, excluding genetic modification. Describe each technology, giving an example of a food product in which it is used. (12 marks)

Question 25**(20 marks)**

In Australia, food plays an important part in our everyday lives. Food consumption patterns are influenced by social, economic, environmental, ethical and political factors. We eat for a variety of reasons and express ourselves through food preparation and presentation.

- (a) Explain, using an example, **one** ethical issue that influences individuals' food consumption patterns. (4 marks)
- (b) Describe how **two** Australian Government policies influence food consumption patterns. (6 marks)
- (c) Explain **two** social influences that affect the food consumption patterns of Australian adolescents. Suggest **one** way in which each influence could impact young people's future health and wellbeing. (10 marks)

Question 26

(20 marks)

The consumer is at the centre of the process of developing a marketing strategy. The Joosilicious Company has developed the new product shown below. It is considering a suitable marketing mix for this product.

Fruit juice product



Front view

Rear view

- (a) Describe the **four** marketing mix strategies used by product developers. (8 marks)
- (b) Explain how a supermarket could use **two** product placement strategies to increase sales of Joosilicious pineapple juice. (6 marks)
- (c) Explain how the labelling on Joosilicious pineapple juice is misleading, supporting your answer with **two** examples. (6 marks)

End of questions

ACKNOWLEDGEMENTS

Question 21(a) Australian Bureau of Statistics (ABS). (2014). *Persons aged 2 years and over – proportion who avoid particular food due to allergies or intolerance 2011–12* [Graph]. Retrieved July, 2017, from www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/4364.0.55.007~2011-12~Main%20Features~Food%20avoidance%20due%20to%20allergy,%20intolerance%20or%20ethical%20religious%20reasons~600
Used under Creative Commons Attribution 2.5 Australia licence.

This document – apart from any third party copyright material contained in it – may be freely copied, or communicated on an intranet, for non-commercial purposes in educational institutions, provided that it is not changed and that the School Curriculum and Standards Authority is acknowledged as the copyright owner, and that the Authority's moral rights are not infringed.

Copying or communication for any other purpose can be done only within the terms of the *Copyright Act 1968* or with prior written permission of the School Curriculum and Standards Authority. Copying or communication of any third party copyright material can be done only within the terms of the *Copyright Act 1968* or with permission of the copyright owners.

Any content in this document that has been derived from the Australian Curriculum may be used under the terms of the Creative Commons [Attribution 4.0 International \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) licence.