



Western Australian Certificate of Education Examination, 2013

Question/Answer Booklet

FOOD SCIENCE AND TECHNOLOGY Stage 3	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 for paper: 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: nil

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 notes or other items of a non-personal nature in the examination room. 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 exam
Section One: Multiple-choice	15	15	25	15	15
Section Two: Short answer	8	8	70	76	40
Section Three: Extended answer	1	1	40	25	20
Section Four: Extended answer (Context-specific)	6	1	45	20	25
				Total	100

Instructions to candidates

- 1. The rules for the conduct of Western Australian external examinations are detailed in the Year 12 Information Handbook 2013. Sitting this examination implies that you agree to abide by these rules.
- 2. 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, Three and Four: Write your answers in this Question/Answer Booklet.

- 3. You must be careful to confine your responses to the specific questions asked and to follow any instructions that are specific to a particular question.
- 4. Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.
 - Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
 - Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number.
 Fill in the number of the question that you are continuing to answer at the top of the page.

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.

3

Suggested working time: 25 minutes.

- 1. Food models are used to
 - (a) inform food intake decisions.
 - (b) regulate food intake decisions.
 - (c) specify food intake decisions.
 - (d) report food intake decisions.
- 2. Global food requirements are driven by
 - (a) food prices and nutrition.
 - (b) societal issues and food prices.
 - (c) increases in population.
 - (d) societal trends and nutrition.
- 3. Consumer rights that influence legal and regulatory processes governing the food industry include access to
 - (a) a safe food supply and information about food products.
 - (b) an economical food supply and a wide range of food products.
 - (c) a wide range of food products and a safe food supply.
 - (d) information about food products and an economical food supply.
- 4. Food products produced using innovative food processes and systems
 - (a) are healthier because they cost more.
 - (b) improve health and wellbeing.
 - (c) prevent chronic disease.
 - (d) increase the range of foods available.
- 5. In order to manage tasks effectively, teams rely on
 - (a) innovative and technological skills.
 - (b) individual and innovative skills.
 - (c) technological and group skills.
 - (d) individual and group skills.

- 6. The collection of data by observing consumer behaviour is an aspect of
 - (a) quantitative research.
 - (b) mathematical research.
 - market research. (c)
 - scientific research. (d)
- 7. The solidity of a crystallised food product such as toffee is influenced by the
 - length of time the sugar solution is exposed to heat. (a)
 - reduction in the sugar content of the solution. (b)
 - presence of acids in the sugar solution. (c)
 - exposure of the sugar solution to low temperatures. (d)
- 8. The influences of race and gender on health are known as
 - (a) historical factors.
 - (b) genetic factors.
 - (c) environmental factors.
 - medical factors. (d)
- 9. Specific food products are developed for a
 - (a) consumer market.
 - population market. (b)
 - (c) commercial market.
 - (d) target market.
- 10. The development and production of food products can be managed by using the
 - analytical process. (a)
 - (b) investigative process.
 - technology process. (c)
 - technical process. (d)
- 11. Competition and innovation in the marketplace result in changes to
 - (a) sustainability and food equity.
 - consumer and enterprise relationships. (b)
 - product life span and variety. (c)
 - food access and nutritional health. (d)

- 12. Consumer access to food resources affects food
 - (a) processing techniques.
 - (b) storage systems.
 - (c) purchasing power.
 - (d) consumption patterns.
- 13. Information about the effect of food processing on the environment enables consumers to make informed

5

- (a) ethical decisions about food.
- (b) health decisions about food.
- (c) economic decisions about food.
- (d) innovative decisions about food.
- Convenience, access to information and an increase in appeal to consumers are functions of food
 - (a) distribution.
 - (b) processing.
 - (c) packaging.
 - (d) marketing.
- 15. Opportunities to expand markets in the food industry are increased by the use of
 - (a) enterprising capabilities.
 - (b) consumer practices.
 - (c) mise-en-place skills.
 - (d) nutritional information.

End of Section One

Section Two: Short answer

40% (76 Marks)

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

6

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

- Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
- Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

Suggested working time: 70 minutes.

Food equity is a major global issue. Developing countries are most affected, sometimes with devastating consequences. Australia also faces challenges in providing adequate nutrition for its entire population.

(a)	Define the term 'food equity'.	(1 mark

AGE 3	7 FOOD SCIENCE AND TECHNOLOGY
Dis	scuss four factors that affect the equitable distribution of the food supply in Australia. (8 marks)
_	

Question 17	(9 marks)
Identify three processing techniques that can be used to tenderise meat. Explain t that occurs when each technique is applied.	he process

Question 18

(6 marks)

9

Despite being costly and time consuming, extensive research occurs before the introduction of a new food product to the market.

Explain three reasons why food product developers collect and analyse data before proceeding with the production of new food products.			

Question 19 (14 marks)

Jake, a 17-year-old, has used a food diary to record his food intake for one day. He wants to try out for the school swimming team. The results of his fitness tests show that he needs to reduce his body fat measurement. He does a light training session three times a week and gets sufficient sleep each night. Morning tea is prepared at home and stored in his locker and lunch is purchased from the school canteen.

Examine the food diary below.

Time	Food and drink consumed
7.30 am	Breakfast:
	3 cups Nutrigrain 1 cup full cream milk 2 thick slices white bread, toasted 3 teaspoons butter 250 ml orange fruit juice drink
10.30 am	Morning tea:
	Sandwich 2 thick slices white bread 3 teaspoons butter 2 slices Italian salami 4 slices tomato 2 tablespoons mayonnaise 600 ml chocolate milk 1 apple
1.00 pm	Lunch:
	2 large sausage rolls 2 tablespoons tomato sauce 1 orange
3.15 pm	Swimming training:
	600 ml sports drink
4.30 pm	Afternoon tea:
	1 takeaway beefburger 1 large chocolate thick shake
7.30 pm	Dinner:
	2 cups commercial pre-prepared beef stir fry with noodles 200 mg strawberry yoghurt
9.00 pm	Supper:
	1 cup milk 3 tablespoons Milo 2 teaspoons sugar

In February 2013, the revised Australian Dietary Guidelines (ADG) were released.

Review Jake's food diary and complete the following: (i) list **four** of the revised ADGs (a)

(12 marks)

- (ii) modify Jake's food intake to reflect each revised ADG
- provide one reason for each modification. (iii)

ADG	Modification	Reason

Question 19 (continued)

(b)	Explain why a revised version of the Australian Dietary Guidelines was released in 2 (2 m		

Question 20 (9 marks)

Identify **three** skills that you have used when working collaboratively to prepare and present food. Describe how each skill contributed to the effectiveness of the work environment.

Skills	Contributes to the work environment
One:	
Two:	
Three:	
Till Ge.	

Question 21 (8 marks)

(a)	Name the level of government responsible for each food safety requirement lister and describe the procedure for its implementation. • monitoring of food manufacturing and retail premises	ed below
	 development of a food standards code a system of food product recalls 	(6 marks)
(b)	Explain the role of critical control points in the maintenance of a safe food supply	y. (2 marks)

esti	ion 22	(15 marks)
	Explain three ways in which food availability influences profits in the food indu	ustry. (6 marks)

Question 23 (6 marks)

Bananas are Australia's most popular fruit. Queensland produces 90% of the bananas grown in Australia and 70% of these are sold through the two major supermarket chains. It is estimated that up to 30% of the bananas produced are discarded before leaving the farms because they fail to meet the product specifications set by the retailers.

the banana crop to be discarded.	(2 marks)
Discuss two reasons why the practice of discarding bananas affects profitability industry.	y of the (4 marks)

End of Section Two

17

This page has been left blank intentionally

Section Three: Extended answer 20% (25 Marks)

This section contains one (1) compulsory question. Write your answer in the spaces provided.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

- Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
- Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

Suggested working time: 40 minutes.

Ques	stion 24	(25 marks)
are e	foods have been processed in some way. The environmental conditions to exposed and the wide range of commercial food processing systems used in erties of foods that are produced.	
(a)	Explain the term 'commercial food processing system'.	(2 marks)
(b)	Identify four processing techniques used in commercial food processing the properties of food.	systems to alter (4 marks)

TAGE 3	19	FOOD SCIENCE	AND TECHNOLOGY
Explain five reasons	why food is commercially p	processed.	(10 marks)

(d)	Identify one commercial food procesing system and discuss the following featu system: • volume of production • degree of automation • labour requirements • production time.	res of that (9 marks)
	Commercial food processing system:	

End of Section Three

Section Four: Extended answer (Context-specific)

25% (20 Marks)

This section is divided into three (3) contexts.

There are two (2) questions for each context. Answer one (1) question only.

Spare pages are included at the end of this booklet. They can be used for planning your responses and/or as additional space if required to continue an answer.

- Planning: If you use the spare pages for planning, indicate this clearly at the top of the page.
- Continuing an answer: If you need to use the space to continue an answer, indicate in the original answer space where the answer is continued, i.e. give the page number. Fill in the number of the question that you are continuing to answer at the top of the page.

Suggested working time: 45 minutes.	

Tick **one** of the boxes in each of the second and third columns to indicate your choice of context and question.

Context	✓	Question √	Pages
Hospitality		Q25 □ or Q26 □	22–25
Nutrition and health promotion		Q27 □ or Q28 □	26–30
Product development		Q29 □ or Q30 □	31–34

Now turn to the relevant pages and answer the question for the context you have selected.

Suggested working time: 45 minutes.			
Ques	stion 25 (20 mar	(20 marks)	
	For copyright reasons this text cannot be reproduced in the online version of this document.		
(a)	Discuss two social, two economic and two political factors that led to this proposal. (12 mar	rks	

fast food sector of the hospitality industry attracts much of evels of diet-related health conditions in Western Australia. (2 marks

Question 26 (20 marks)

Market research is undertaken by all sectors of the hospitality industry to determine consumer purchasing patterns and their impact on profitability.

	onsumers. (4 marks
Coffee shop patrons can order skinny lattes, which are made using fat-real ldentify and describe one technological development that has enabled the fat-reduced milk.	duced milk. e production of (4 marks

C	Identify two consumer beliefs and two consumer values. Explain in detail how eaconsumer belief and value encourages the hospitality industry to produce product meet consumer needs. (1)	ach ts that 2 marks)
E	Beliefs:	
-		
_		
-		
-		
-		
-		
-		
-		
-		
-		
-		
١	Values:	
_		
-		
-		
-		
-		
-		
_		
-		
_		

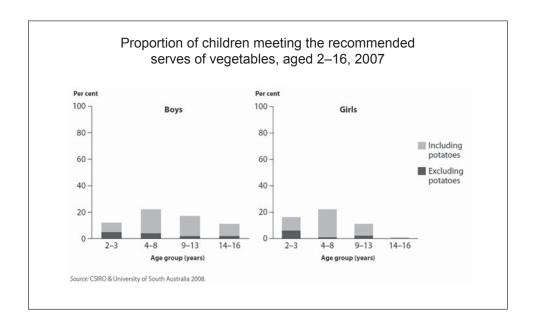
Context: Nutrition and health promotion

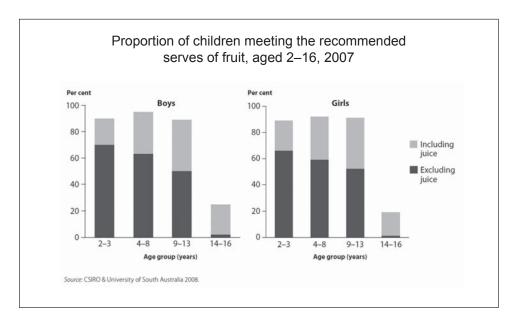
Answer one (1) question only, either Question 27 or Question 28.

Suggested working time: 45 minutes.

Question 27 (20 marks)

There is increasing concern about the levels of consumption of fruit and vegetables by Australians. National data (2007) shows that only six per cent of people consume sufficient fruit and vegetables on a regular basis. The information provided in the graphs below suggests that young people in particular may be at risk.





STAGE 3 NUTRITION AND HEALTH PROMOTION

27 FOOD SCIENCE AND TECHNOLOGY

Using the information from the graphs most vegetables. Propose one reasor	n for this.	3 - 4	(4 marks
Explain three impacts on health asso	ciated with the consur	ription of truit by ci	(6 marks
Explain three impacts on health associated associated as shown in the graph.	ciated with the consun	ription of fruit by Ci	(6 marks
Explain three impacts on health assortion 14–16, as shown in the graph.	clated with the consun	inplion of fruit by G	(6 marks
Explain three impacts on health assor	ciated with the consun	inplion of fruit by G	(6 marks
Explain three impacts on nealth assortion 14–16, as shown in the graph.	ciated with the consun	nption of fruit by G	(6 marks
Explain three impacts on health assortion 14–16, as shown in the graph.	ciated with the consun	nption of fruit by ci	(6 marks
Explain three impacts on health assortion 14–16, as shown in the graph.	clated with the consun	inplion of fruit by G	(6 marks
Explain three impacts on health assorbed.	clated with the consun	inplion of fruit by G	(6 marks
Explain three impacts on health assortion 14–16, as shown in the graph.	ciated with the consun	inplion of fruit by G	(6 marks
Explain three impacts on health assortion 14–16, as shown in the graph.	ciated with the consun	inplion of fruit by G	(6 marks
Explain three impacts on health assortion 14–16, as shown in the graph.	clated with the consun	inplion of fruit by G	(6 marks
Explain three impacts on health assortion 14–16, as shown in the graph.	clated with the consun	inplion of fruit by G	(6 marks
Explain three impacts on health assortion 14–16, as shown in the graph.	crated with the consun	inplion of fruit by G	(6 marks
Explain three impacts on health assortion 14–16, as shown in the graph.	clated with the consun	inplion of fruit by G	(6 marks)
Explain three impacts on health assortion 14–16, as shown in the graph.	clated with the consun	inplion of fruit by G	(6 marks)
Explain three impacts on health assortion 14–16, as shown in the graph.	clated with the consun	inplion of fruit by Ci	(6 marks

NUTRITION AND HEALTH PROMOTION

Question 27 (continued)

Discuss five strategies that could be used by government or food producers encourage the increased consumption of fruit and vegetables (excluding potential)	to atoes). (10 marks)

28

Question 28

(20 marks)

	benefits of consuming functional foods.	(6 n
-		
processed fund	ational health priority area that could be supported ctional food in the diet. Describe a processed funct t this national health priority.	by the inclusion of a ional food and state (5 n
processed fund	ctional food in the diet. Describe a processed funct	ional food and state
processed fund	ctional food in the diet. Describe a processed funct	ional food and state
processed fund	ctional food in the diet. Describe a processed funct	ional food and state
processed fund	ctional food in the diet. Describe a processed funct	ional food and state
processed fund	ctional food in the diet. Describe a processed funct	ional food and state
processed fund	ctional food in the diet. Describe a processed funct	ional food and state
processed fund	ctional food in the diet. Describe a processed funct	ional food and state
processed fund	ctional food in the diet. Describe a processed funct	ional food and state
processed fund	ctional food in the diet. Describe a processed funct	ional food and state

STAGE 3 NUTRITION AND HEALTH PROMOTION

Question 28 (continued)

Describe the influence of government, the food i promotion of good health.	ndustry and the individual on the (9 marks

Context: Product development					
Answ	er one (1) question only, either Question 29 or Question 30.				
Sugge	ested working time: 45 minutes.				
Ques	tion 29	(20 marks)			
	manufacturers develop and release onto the market dozens of new products of these products contain additives.	s each year.			
(a)	Explain the term 'food additive'.	(2 marks)			
(b)	Describe three legal obligations concerning the use of food additives by pr developers.	roduct (6 marks)			

Question 29 (continued)

Identify four food additives and state why product developers would use ear. For each additive, give an example of a food product in which it is used.	ach additive. (12 marks)

Question 30 (20 marks)

33

The food industry is constantly changing. New discoveries and advances in technology and science have the potential to offer food product manufacturers the opportunity to develop innovative products that meet the needs of consumers and increase their profitability.

Outline four impacts of the application of biotechnology on food production	n. (4 r
Identify and describe one emerging technology that is used by product de-	veloners
Identify and describe one emerging technology that is used by product de maintain the safety and quality of food during its storage and distribution to	velopers to consum (4 r
Identify and describe one emerging technology that is used by product de maintain the safety and quality of food during its storage and distribution to	o consum
Identify and describe one emerging technology that is used by product de maintain the safety and quality of food during its storage and distribution to	o consum
Identify and describe one emerging technology that is used by product de maintain the safety and quality of food during its storage and distribution to	o consum
Identify and describe one emerging technology that is used by product de maintain the safety and quality of food during its storage and distribution to	o consum
Identify and describe one emerging technology that is used by product de maintain the safety and quality of food during its storage and distribution to	o consum

Question 30 (continued)

modification in food productio	•••		(12 n

FOOD SCIENCE AND TECHNOLOGY	42	STAGE 3
Additional working space		

ACKNOWLEDGEMENTS

Section Two

Question 23 Data source: Australian Institute of Health and Welfare (AIHW).

(2012). Australia's food and nutrition 2012. Canberra: AIHW, p.123.

Section Four

Question 25 Adapted from: O'Leary, C. (2013, January 16). New plan for a

healthier WA. The West Australian, p. 5.

Question 27 Table adapted from: Australian Institute of Health and Welfare (AIHW).

(2012). Proportion of children meeting the recommended serves of vegetables, aged 2–16, 2007. *Australia's food and nutrition 2012*.

Canberra: AIHW, p.149.

Table adapted from: Australian Institute of Health and Welfare (AIHW). (2012). Proportion of children meeting the recommended serves of fruit, aged 2–16, 2007. *Australia's food and nutrition 2012*. Canberra:

AIHW, p.149.

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 <u>Creative Commons Attribution-NonCommercial 3.0 Australia licence.</u>