



Western Australian Certificate of Education Examination, 2015

Question/Answer Booklet

FOOD SCIENCE AND TECHNOLOGY Stage 3

Please place your student identification label in this box

Student Number: In figures

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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: non-programmable calculators approved for use in the WACE examinations

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	20	20	20	20	20
Section Two: Short answer	8	8	100	70	60
Section Three: Extended answer	3	2	60	40	20
Total					100

Instructions to candidates

- The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2015*. 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 responses to the specific questions asked and to follow any instructions that are specific to a particular question.
- 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**20% (20 Marks)**

This section has **20** 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: 20 minutes.

1. Low intake of dairy foods may lead to
 - (a) anaemia.
 - (b) osteoporosis.
 - (c) hypertension.
 - (d) malnutrition.

2. A workflow or production plan is used to
 - (a) save production time, minimise food wastage and increase productivity.
 - (b) increase productivity, save production time and decrease staff numbers.
 - (c) minimise food wastage, increase cooking time and prevent equipment failures.
 - (d) decrease staff numbers, prevent equipment failures and increase cooking time.

3. The responsibility of Food Standards Australia New Zealand for food products imported into Australia is to
 - (a) develop standards for the packaging of imported products.
 - (b) monitor the safety of food products packaged in Australia.
 - (c) conduct inspections to identify illegally imported foods.
 - (d) develop risk assessment policies for imported foods.

4. Safe use of equipment in a busy kitchen will help reduce the risk of
 - (a) injuries and litigation.
 - (b) cross contamination and conflict.
 - (c) litigation and cross contamination.
 - (d) conflict and injuries.

5. Food producers have an obligation to produce food that is
 - (a) palatable and appetising.
 - (b) safe and economical.
 - (c) safe and palatable.
 - (d) appetising and economical.

See next page

6. When using Australian metric standards $\frac{1}{4}$ cup of oil equals
- (a) 2 tablespoonsful.
 - (b) 2.5 tablespoonsful.
 - (c) 3 tablespoonsful.
 - (d) 3.5 tablespoonsful.
7. Stewing rather than roasting meat can be justified as it
- (a) takes longer to cook.
 - (b) makes the meat tender.
 - (c) improves the flavour.
 - (d) is more economical.
8. Wet cooking methods used to process food safely include
- (a) pickling, stewing and smoking.
 - (b) fermentation, dehydration and simmering.
 - (c) simmering, stewing and boiling.
 - (d) boiling, fermentation and smoking.
9. Dry frying is a method of cooking in
- (a) the fat that runs from the food as it is heated.
 - (b) a small amount of oil heated in a wok.
 - (c) sufficient oil to submerge food.
 - (d) a small amount of water added to a frying pan.
10. The impact of biotechnology on food processing increases the opportunity for
- (a) higher crop yields and improved primary production.
 - (b) a wider variety and increased quality of food products.
 - (c) improved primary production and a wider variety of food products.
 - (d) increased quality of food products and higher crop yields.
11. Processing techniques have an impact on nutritional value as they affect the
- (a) preservation properties of foods.
 - (b) sensory properties of foods.
 - (c) physical properties of foods.
 - (d) chemical properties of foods.
12. The Australian Association of National Advertisers Code for Advertising 2008 is a
- (a) mandatory code.
 - (b) self-regulatory code.
 - (c) government code.
 - (d) compulsory code.

See next page

13. Vacuum packaging is a process whereby
- (a) sterility is achieved with a flash heating process.
 - (b) a controlled gas blend is used to package the food.
 - (c) air is removed from the package prior to sealing.
 - (d) the food is protected from the external environment.
14. Which of the following is a fortified food product?
- (a) calcium-enriched milk
 - (b) fat-reduced cheese
 - (c) omega-3 eggs
 - (d) gluten-free flour
15. A packaging process in which the food and the package are sterilised separately is called
- (a) active packaging.
 - (b) barrier-specific packaging.
 - (c) modified atmosphere packaging.
 - (d) aseptic packaging.
16. Natural disasters affect the food supply by
- (a) reducing the availability of food.
 - (b) increasing food availability.
 - (c) expanding food variety.
 - (d) reducing foreign aid.
17. The ability to produce foods with improved characteristics can be achieved by
- (a) gene manufacturing.
 - (b) nutrient structuring.
 - (c) genetic modification.
 - (d) natural selection.
18. A combination of which of the following strategies is used by soft drink manufacturers to gain a competitive edge in the market place?
- (a) promotion, price manipulation and price structure
 - (b) product planning, price structure and promotion
 - (c) product planning, product information and place
 - (d) place, product information and price manipulation

19. The Australian Quarantine Inspection Service is responsible for
- (a) regulating the sale price of food products imported into Australia.
 - (b) regulating the sale price of food products exported from Australia.
 - (c) developing legislation that controls the labelling of imported foods.
 - (d) management of processes that ensure food imports meet Australian standards.
20. Processed functional foods are those that
- (a) have been created as line extensions of other products.
 - (b) have had the nutrient content altered to add health benefits.
 - (c) have been fortified with nutrients lost during food processing.
 - (d) provide the body with the sustenance needed for good health.

End of Section One

See next page

Section Two: Short answer

60% (70 Marks)

This section has **eight (8)** questions. Answer **all** questions. Write your answers 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: 100 minutes.

Question 21**(8 marks)**

Ben had just completed an interview for his first job in the food industry. The employer told him he would start on the roster in one week's time. As Ben was keen to start earning money, he was delighted when the employer phoned and asked if he could work an evening shift that same night, as an employee was sick. As the air conditioning was not working, the employer told Ben to wear light, comfortable clothing and report for the shift at 6 pm. Ben was required to clear tables and make sure the restrooms were kept clean during the evening's service. At the end of the shift, he was required to clean the restrooms and floors thoroughly and sanitise the counters and tables. While he was cleaning the restrooms, he spilt a bucket containing cleaning chemicals and burned the skin on his hands and legs. He decided to wait until he got home so that his mother could tend to his injuries.

- (a) Describe **two** employer obligations and **two** employee obligations that have not been met under the *Occupational Safety and Health Act 1984*. (4 marks)

Question 21 (continued)

- (b) Describe **four** consequences for employers of not providing safe work environments.

(4 marks)

Question 22

(12 marks)

(a) Identify **two** reasons why food is preserved.

(2 marks)

(b) Explain **two** causes of food spoilage.

(4 marks)

(c) Explain how the application of **two** food processing techniques preserves food. Provide **one** example of each technique.

(6 marks)

Question 25

(8 marks)

An understanding of how the properties and performance of food are controlled during processing is essential when adapting and developing new food products. It is also necessary in the analysis of why recipes fail.

Read the following recipe.

The Perfect Cake

Ingredients	Method
100 g plain flour 40 g custard powder or cornflour 1 teaspoon baking powder 4 eggs at room temperature 165 g castor sugar 20 ml water	<ol style="list-style-type: none">1. Preheat oven to 190° C.2. Grease and flour two sponge tins.3. Combine flour, baking powder and custard powder or cornflour. Sift twice.4. Separate eggs, beat whites in a clean bowl using an electric beater.5. Gradually add sugar, beating until whites are very stiff.6. Add egg yolks and continue beating until mixture resembles a thick cream.7. Use a metal spoon to very lightly fold in sifted flours.8. Pour evenly into prepared tins.9. Bake 20 minutes.10. Remove from oven, remove from tins and cool on a rack.

Complete the following table.

Explain **one** way in which **each** of the following controlling factors influence the production of The Perfect Cake:

- equipment
- ingredients
- processing techniques
- environment.

Controlling factors	Explanation
Equipment	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Ingredients	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Processing techniques	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Environment	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Question 27 (continued)

- (b) Draw **one** conclusion from your analysis of the data shown in the graph. (2 marks)

Question 28

(8 marks)

The main reason for the development of new technologies in the food industry is to improve and increase the range of food products available to consumers. Ingredients, production processes and packaging are often improved by the application of new technologies.

Identify **one** technology used to improve ingredients and **one** technology used to improve a production process in the food industry. Explain how and why **each** is used. Provide **one** example of a food product made using **each** technology.

Technology used to improve ingredients: _____

<p>How the technology is used</p>	<p>_____</p> <p>_____</p> <p>_____</p>
<p>Why the technology is used</p>	<p>_____</p> <p>_____</p> <p>_____</p>
<p>Food product example</p>	<p>_____</p>

Technology used to improve a production process: _____

<p>How the technology is used</p>	<p>_____</p> <p>_____</p> <p>_____</p>
<p>Why the technology is used</p>	<p>_____</p> <p>_____</p> <p>_____</p>
<p>Food product example</p>	<p>_____</p>

End of Section Two

See next page

Section Three: Extended answer

20% (40 Marks)

This section contains **three (3)** questions. Answer **two (2)** questions only. Write your answers in the spaces provided following Question 31.

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.

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- 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: 60 minutes.

Question 29**(20 marks)**

The national health priorities initiative in Australia is a collaborative effort endorsed by the Commonwealth, State and Territory governments.

- (a) Describe the purpose of the national health priorities initiative. (2 marks)

Under-consumption and over-consumption of macronutrients and micronutrients in the body contribute to the overall burden of disease. Improving the nutritional status of Australians can play an important role in addressing the increase in many diet-related health conditions.

- (b) Identify **three** diet-related health conditions that have been identified as national health priorities. Discuss the dietary related risk factors and the effects on health of **each** condition. (9 marks)

Cause of death statistics are a key to understanding Australian society and health. These statistics provide insight into diseases and factors contributing to reduced life expectancy of Australians.

An increasing number of these deaths are caused by poor lifestyle factors.

- (c) Explain how **three** lifestyle factors cause health issues in present day Australian society. Identify a diet-related health conditions for each lifestyle factor. (9 marks)

Question 30**(20 marks)**

The way in which food is produced has an increasing influence on consumers. A range of ethical and environmental issues creates awareness of how crops and livestock are grown and raised. This, in turn, translates into the way consumers make food choices.

- (a) Describe briefly **each** of the following farming systems:
- intensive farming
 - biological **or** organic farming
 - genetically modified farming
 - sustainable farming.
- (4 marks)

See next page

- (b) Discuss **two** ways in which secondary food processing techniques affect food consumption. (4 marks)
- (c) Discuss **two** impacts on the food supply of **each** of the following primary food production practices:
 • land degradation
 • water use
 • the use of chemicals. (12 marks)

Question 31**(20 marks)**

Legislation has established processes that regulate standards of food hygiene. Food safety programs are based on the Hazard Analysis Critical Control Point (HACCP) system.

- (a) Identify who is required to have a HACCP system in place and describe **three** reasons why the system is necessary. (4 marks)
- (b) Describe **two** ways in which legislation regulates standards of food hygiene in Western Australia and outline **two** ways in which the standards are monitored. (4 marks)

Read the following scenario.

Food on the Run is a small cafe in the Perth business district. It provides a range of hot and cold takeaway food items and has a small area where customers can dine-in. The menu is to be expanded with the addition of several pasta dishes. One will be the Penne and Chicken Bake, the recipe for which is provided below. It will be offered as an individual-sized hot takeaway, a family-sized frozen takeaway and dine-in customers will be served from a bain marie. Dine-in purchases will be accompanied by a salad. As a new product range is being introduced, the cafe's HACCP plan will need to be revised.

Penne and Chicken Bake (individual serve)

Ingredients	Method
20 g butter ½ onion finely chopped 60 g plain flour 500 ml milk 100 g chopped, cooked chicken 160 g cooked penne 1 cup cooked frozen peas 100 g grated tasty cheese 60 g grated parmesan cheese	1. Preheat oven to 180 °C, grease foil container or bain marie tray. 2. Melt butter, add onion and cook until tender. 3. Add flour, stir until smooth. 4. Add half of the milk and stir until smooth. 5. Add remainder of milk and stir until mixture boils and thickens. 6. Add chicken, peas, pasta and cheese. 7. Place in a foil container or bain marie tray. 8. Bake 25 minutes until browned and heated through.

- (c) Identify **four** food hygiene practices that should be considered as critical control points in the production and service of the Penne and Chicken Bake. Explain why **each** must be monitored to ensure the food is safe to consume. (12 marks)

End of questions

ACKNOWLEDGEMENTS

Section Two

- Question 27** Department of Agriculture. (2014). Shares of weekly household expenditure on food and beverage, by type [Graph]. In *Australian food statistics 2012–13*, p. 18 (Figure 15). Retrieved January 14, 2015, from www.agriculture.gov.au/SiteCollectionDocuments/ag-food/publications/food-stats/australian-food-statistics-2012-13.pdf
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Section Three

- Question 29 (c)** Data source: Australian Bureau of Statistics (ABS). (2010). *Causes of Death, Australia, 2008*. Retrieved February 2, 2015, from www.abs.gov.au/ausstats/abs@.nsf/Products/E5E96AF98A508730CA2576F600121EBC?opendocument

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