



ATAR course examination, 2021

Question/Answer booklet

FOOD SCIENCE AND TECHNOLOGY

Please place your student identification label in this box

WA student number: In figures

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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: up to three calculators, which do not have the capacity to create or store programmes or text, are permitted in this ATAR course 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	79	55
Section Three Extended answer	3	2	70	40	30
Total					100

Instructions to candidates

1. The rules for the conduct of the Western Australian external examinations are detailed in the *Year 12 Information Handbook 2021: Part II Examinations*. 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. Do not use erasable or gel pens. 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.

3. 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.
4. Supplementary pages for planning/continuing your answers to questions are 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. Do not use erasable or gel pens. 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. An effective approach to the production of a food product that responds to consumer need is to use the
 - (a) technology process.
 - (b) investigative process.
 - (c) development process.
 - (d) evaluation process.

2. A biscuit company repackaging its product into snack-sized packets for use in children's lunch boxes is an example of a production decision based on
 - (a) commodities.
 - (b) quantities.
 - (c) price.
 - (d) equipment.

3. Functional foods that contribute toward both neural development and skeletal structure include
 - (a) fish and Greek yoghurt.
 - (b) cheese and spinach.
 - (c) almonds and oats.
 - (d) cranberries and soybeans.

4. The role of probiotics in promoting health includes
 - (a) reducing constipation and urinary tract infections.
 - (b) improving calcium absorption and immune health.
 - (c) reducing the risk of cardiovascular disease and bone disease.
 - (d) improving gastrointestinal health and systemic immunity.

5. Micronutrient supplements
 - (a) may provide valuable amounts of micronutrients which are not contained within a person's diet.
 - (b) may interact with prescription medication and make it easier to manage medical conditions.
 - (c) are regulated by FSANZ and may contain undeclared substances that affect health.
 - (d) are cheaper to buy when micronutrients sourced from whole foods are expensive.

See next page

6. Government policies that can influence the global food supply include
- (a) fair trade and advertising strategies.
 - (b) manufacturing profits and free trade agreements.
 - (c) free trade agreements and fair trade.
 - (d) advertising strategies and manufacturing profits.
7. Commercially processed food affects
- (a) primary food production standards.
 - (b) government policies related to food.
 - (c) the food available to the consumer.
 - (d) sustainability of the food supply.
8. Variations in the sustainability of food production in Australia may be influenced by
- (a) climate changes.
 - (b) retail prices.
 - (c) consumer choice.
 - (d) location of food outlets.
9. Changing demographics influence the development of new food products that
- (a) appeal to the whole of the Australian population.
 - (b) are marketed to low socio-economic populations.
 - (c) use innovative production equipment and techniques.
 - (d) target consumers with similar characteristics.
10. Undernutrition may be evident at any stage of life when circumstances deprive people of adequate nutrition. These circumstances may include
- (a) access to affordable medical care and genetics.
 - (b) humanitarian crises and access to affordable medical care.
 - (c) poor feeding practices and humanitarian crises.
 - (d) genetics and poor feeding practices.
11. An example of incomplete proteins complementing each other to provide the essential amino acids is
- (a) scrambled eggs on wholegrain toast.
 - (b) beef soup with soybeans.
 - (c) wholegrain bread and peanut butter.
 - (d) jacket potato topped with cheese.

12. The economic consequences of unsafe work practices for employers and employees may include
- (a) time taken to train employees in conflict resolution and the cost of a less-efficient workforce.
 - (b) the cost of a less-efficient workforce and support from community counselling services.
 - (c) support from community counselling services and scheduling of relief staff during busy periods.
 - (d) scheduling of relief staff during busy periods and time taken to train employees in conflict resolution.
13. If tiny droplets of one substance are suspended in another unmixable substance, the result is called
- (a) a solution.
 - (b) a foam.
 - (c) an alloy.
 - (d) an emulsion.
14. A recipe for pistachio and cranberry biscotti requires 130 g of cranberries. How much does the quantity of cranberries used in the recipe cost if they are sold in packets of 150 g for \$2.20?
- (a) \$1.69
 - (b) \$1.91
 - (c) \$2.20
 - (d) \$2.54
15. Which of the following correctly states the role of the associated organs in the digestion of macronutrients?
- (a) the pancreas produces insulin, the liver produces bile, and the gall bladder stores bile to be released into the small intestine.
 - (b) the pancreas produces insulin, the liver converts insulin into bile, and the gall bladder regulates the release of bile into the large intestine.
 - (c) the pancreas secretes digestive juices, the liver converts insulin into bile, and the gall bladder regulates the release of bile into the large intestine.
 - (d) the pancreas secretes digestive juices, the liver produces bile, and the gall bladder stores bile to be released into the small intestine.

End of Section One

See next page

Section Two: Short answer

55% (79 Marks)

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

Supplementary pages for planning/continuing your answers to questions are 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

(9 marks)

Micronutrients, such as vitamins and minerals, are important for good health.

In the table below, identify **three** minerals. For each, state the impact of the mineral on health and provide an example of a food source containing the mineral.

Mineral	Impact on health	Food source
One: 	 <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	 <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Two: 	 <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	 <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Three: 	 <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	 <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Question 17

(10 marks)

- (a) Explain what is meant by the term 'food product recall' and identify the organisation responsible for coordinating the recall of food in Australia. (4 marks)

Organisation: _____

- (b) Describe **three** reasons why food products may be recalled. (6 marks)

One: _____

Two: _____

Three: _____

Question 18**(10 marks)**

Jordee works as a research and development officer for a chain of gourmet food stores that operate at all major airports in Australia. These stores sell a range of local and native Australian food items for international visitors to buy as souvenirs as they leave the country. The company wishes to introduce a new gourmet biscuit that would add to the product range.

- (a) State the purpose of a product proposal. (1 mark)

Complete the following table.

- (b) Identify and describe **three** components of a product proposal. For each component, use the information given in the scenario on page 8 to identify **one** feature of the product that would satisfy each component in the product proposal. (9 marks)

Component of the product proposal	Description	Feature of the product
One:	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Two:	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Three:	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

See next page

Question 19

(9 marks)

Read the following recipe.

White bread loaf

Ingredients	Method
10 g dried yeast 1½ teaspoons sugar 1 cup warm water 450 g bread flour 1 teaspoon salt 1 tablespoon oil	<ol style="list-style-type: none"> 1. Mix yeast with sugar and some of the warm water. 2. Sift flour and salt. 3. Add yeast mixture, oil and remaining water. 4. Turn on to a lightly-floured board and knead until dough is smooth and elastic. 5. Cover with plastic wrap and rest dough for five minutes. 6. Knead, shape into a loaf and place into a greased loaf pan. 7. Cover with plastic wrap and prove in a warm place for 40 minutes or until the dough has doubled in size. 8. Remove plastic wrap. Sprinkle lightly with water. 9. Place into a preheated 220 °C oven for a minimum of 20 minutes. 10. Remove from pan and cool on a cooling rack.

Explain **one** way in which **each** of the following factors influences the production of the loaf of bread:

- ingredients
- processing techniques
- environment.

Ingredients: _____

Processing techniques: _____

Environment: _____

Question 20

(12 marks)

The marketing mix refers to a set of strategies, actions or tactics that a company uses to sell products.

Identify the **four** components of the marketing mix and describe how **each** is used to market a new food product.

One: _____

Two: _____

Three: _____

Four: _____

Question 21**(9 marks)**

Digestive conditions can cause severe health consequences.

In the table below, identify **three** digestive conditions that cause the body to be unable to process nutrients. For **each** condition, identify the health consequence and outline the cause.

Digestive condition	Health consequence	Cause of the condition
One: <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/>
Two: <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/>
Three: <hr/> <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/> <hr/>	<hr/> <hr/> <hr/> <hr/> <hr/>

Question 22

(11 marks)

Favourable conditions have meant that Ben has produced an abundant crop of tomatoes in his vegetable garden this year. However, he does not want to take up space in his fridge/freezer and is debating how best to preserve them. He has asked you to help him decide.

Complete the following table.

- (a) Identify **two** methods of preservation that Ben could use to preserve his tomatoes effectively. State **one** way in which each of the sensory, physical and chemical properties is affected by each method of preservation. (8 marks)

Preservation method	One: _____	Two: _____
Effect on sensory properties	_____ _____ _____ _____	_____ _____ _____ _____
Effect on physical properties	_____ _____ _____ _____	_____ _____ _____ _____
Effect on chemical properties	_____ _____ _____ _____	_____ _____ _____ _____

Freezing is a popular form of food preservation but is dependent on the correct storage environment to maintain desirable sensory and physical properties.

- (b) Explain **one** way in which frozen produce may lose sensory **or** physical quality if the storage environment is not maintained. (3 marks)

Question 23

(9 marks)

Identify **three** macronutrients found in the list of ingredients for minestrone soup shown below. Describe **two** processes of chemical digestion for each of the macronutrients.

Minestrone soup

- Oil
- Bacon
- Onion
- Crushed tomatoes
- Chicken stock
- Tomato paste
- Carrot
- Macaroni

Macronutrient one: _____

Macronutrient two: _____

Macronutrient three: _____

End of Section Two

See next page

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

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

Supplementary pages for planning/continuing your answers to questions are 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)**

Food selection models and the Australian Dietary Guidelines can be used to evaluate the nutritional needs of population groups.

- (a) Explain how **two** Australian Dietary Guidelines relate to the nutritional needs of population groups. Include **one** example of how each can aid a population group in the prevention of diet-related health disorders. (6 marks)
- (b) Describe why **one** population group may be of greater risk of developing anaemia. (2 marks)

Jacinta, a 17-year-old, uses a food diary to record her food intake for one day. She does a light training session and plays in a social sports team once a week, and gets sufficient sleep each night. Her mid-morning snack and lunch are prepared at home and stored in her locker.

Breakfast

$\frac{3}{4}$ cup cereal
 $\frac{1}{2}$ cup full cream milk
1 slice white bread, toasted
2 teaspoons butter
 $1\frac{1}{2}$ tablespoons peanut paste
250 ml orange fruit juice drink

Mid-morning snack

4 wholegrain crispbread
3 cm cube cheese

Lunch

2 slices white bread
1 tablespoon butter
4 slices Italian salami
4 slices tomato
1 tablespoons mayonnaise
1 apple
600 ml chocolate milk

Afternoon snack

1 banana

Dinner

200 g grilled chicken
1 baked potato with sour cream
 $\frac{1}{2}$ cup steamed carrots
 $\frac{1}{2}$ cup steamed broccoli
200 g strawberry yoghurt

Supper

1 cup milk
3 tablespoons Milo
2 teaspoons sugar

- (c) Analyse Jacinta's food diary and identify **three** areas in which her diet could be improved to meet the nutritional requirements of the adolescent population group. For **each** improvement, explain the health benefit of the change. (12 marks)

Question 25**(20 marks)**

Advancements in technology continue to improve the ability of the food industry to supply the food requirements of consumers.

- (a) Describe **three** innovative developments that alter the nutrition of, and increase the availability of, food. (6 marks)

One reason for the development of new technologies in the food industry is to improve and increase the range of food products that meet consumers' needs and preferences.

- (b) Identify and explain **two** innovative developments that alter the atmosphere inside packages to extend the shelf life of foods. (8 marks)
- (c) Identify and explain **one** technology used to alter the nutrient composition of milk. Identify **two** milk products produced using this process. (6 marks)

Question 26**(20 marks)**

Food processing is any technique that changes raw plant or animal material into safe edible food.

- (a) Outline **four** techniques used to adapt recipes. (4 marks)
- (b) Describe **two** criteria used to analyse a food product during production. (4 marks)
- (c) Explain how **each** of the following food processing techniques is used to control the performance of food:
- pH level
 - addition of chemicals
 - removal of moisture
 - control of temperature.
- (12 marks)

End of questions

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