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# VCE Extended Investigation

## Sample Questions

### Critical Thinking Test

These sample questions are intended to demonstrate new and revised item types that may be used in the Critical Thinking Test. They do **not** constitute a full Critical Thinking Test, and items may appear in any order.

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SAMPLE

**Question 1** (4 marks)

Some scientists believe that it may be possible to use cloning to bring back the Tasmanian tiger, a large carnivorous marsupial that became extinct in 1936.

Consider the following proposition:

**Scientists should try to bring the Tasmanian tiger back from extinction.**

Below is a table with some arguments for and against the proposition.

Read the four statements below. Select the most appropriate of the statements for four of the empty cells in the table (in the correct column **and** in opposition to a relevant argument).

1. If reintroduced into the wild, Tasmanian tigers could help control pests such as foxes.
2. Unexpected scientific advances can come from this type of experimentation.
3. It is never wise to interfere with natural processes such as extinction.
4. Our efforts should be directed mainly towards climate science, rather than local projects.

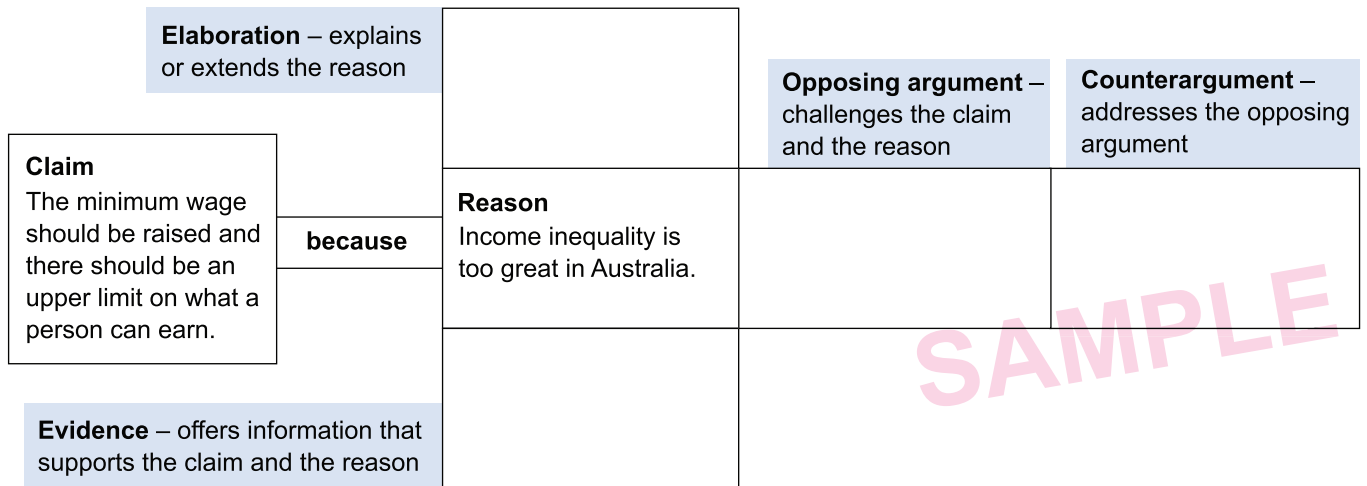
For	Against
Humans are responsible for the extinction of the Tasmanian tiger, so we should try to undo the damage.	
	Governments should be funding research with more long-term benefit to the community.
Tasmania's tourism sector would benefit.	
Australian scientists would gain some much-needed international recognition.	
	There are no environmental advantages to bringing back the Tasmanian tiger.
	This project could divert public attention away from environmental issues such as the plight of the Tasmanian devil.

**Question 2** (4 marks)

The diagram below represents a line of reasoning about reducing inequality between incomes. A claim and a supporting reason are shown.

Read the six statements below and select the most appropriate statement for each empty cell in the diagram.

1. All work has value and lower-paid workers need to sustain themselves and support their families.
2. Women face particular barriers to high pay, especially in male-dominated industries.
3. Financial disadvantage limits opportunities for the next generation, leading to a cycle of poverty.
4. Victoria was one of the first places in the world to set a minimum wage for some industries.
5. The lowest-paid 20 per cent of wage-earners receive only six per cent of all household income.
6. Wages should depend on skill levels and the quality of a person’s contribution.



**Question 3** (3 marks)

The passage below presents an argument.

There are lots of attractions to working in the city, and no one can blame young graduates for wanting to stay there, but life in the country can be very good, if only they would try it out.

Far too many people in regional Victoria are missing out on access to medical services.

In some areas, hardly anyone can get to see a doctor, with waiting lists stretching over many weeks, according to local authorities there.

The shortage puts pressure on regional hospitals, and the extra workload leads to the further loss of many trained health professionals.

Young doctors leave their training with as much as \$100 000 in student loan debt and are keen to pay it off as soon as possible.

Financial incentives to attract doctors to rural areas have been successful in other places and should be tried here.

Select three statements that best match the functions described below. Place each statement in the appropriate box.

<p><b>Claim</b></p>	<p><b>Reason</b></p>
<p>The main idea the argument is proposing</p>	<p>The main supporting reason for the claim</p>
<p><b>Evidence</b></p>	
<p>The information supporting the claim and the reason</p>	

**Question 4** (4 marks)

The argument below consists of a claim and a supporting reason.

Write an opposing argument that directly challenges both the claim and the reason.

Do not merely state the opposite of the claim or the reason.

Claim		Reason
Parents and guardians should have read-only access to the online presence of their children up to the age of 16.	<b>because</b>	This would help promote responsible online behaviour.

Opposing argument

SAMPLE

**Question 5** (4 marks)

The argument below consists of a claim and a supporting reason.

Claim		Reason
Large-scale data collection by AI companies should be supported by the Australian Government.	<b>because</b>	This could accelerate the advancement of beneficial AI technology.

Critically evaluate the argument.

In your response, show why the argument should **not** be accepted.

SAMPLE

**Question 6** (6 marks)

The table below contains a range of material relating to whether scientists should attempt to bring back the Tasmanian tiger, or thylacine, a dog-like marsupial that became extinct in 1936.

Present an argument **for** or **against** a scientific effort to bring back the Tasmanian tiger. Your argument should include a clear position and supporting reasons, and should address at least **one** counterargument. You may use as much or as little of the material provided as you wish.

'There are many things we need to do to address the environmental problems facing our planet. Revival of a particular lost species is not one of them.'	Seen as a threat to farming, the thylacine was hunted to extinction in Tasmania by settlers.	Relatively little is known of this apex predator and its impact on the environment if reintroduced cannot be predicted.
'Extinction is a natural process and not something we should be attempting to reverse.'	The thylacine became extinct on mainland Australia over 3000 years ago, and only survived in Tasmania because it was isolated.	Research indicates that thylacine numbers were in decline before the arrival of human beings in Australia.
'Humans should try to undo the damage we have caused, whenever possible.'	Australian scientists would gain an enormous boost in recognition if this turned out to be possible.	Projects like this can result in unexpected scientific advances, even if they don't quite succeed.
Apart from its striped appearance and pouch, the thylacine was very similar to other dog-like animals, such as wolves, dingoes and foxes.	Tasmania's tourism sector would benefit enormously from this, assuming that the thylacine could be established in its former habitat.	'Does anything good ever come out of these science-fiction ideas?'

**Question 7** (6 marks)

Read the following extract from a newspaper report.

## Experts Debate Compulsory Team Sports in Primary Schools

*As the government considers the idea of requiring all primary school students to participate in team sports, experts are divided.*

Dr Zarel Wynfrey, a public health expert, draws attention to the proven health benefits of any regular participation in sports, as well as the social and technical learning involved in team sports – understanding the rules, managing competition, cooperating with others and contributing to something larger than oneself. ‘Studies show that regular sporting activity improves cardiovascular health and improves health outcomes in later years,’ she explains, referencing recent international research.

Wynfrey points to findings from major sports science research, indicating that team-based physical activity contributes much to general learning, leading to improved academic performance: ‘Regular team sport offers more than just physical benefits – it also helps increase social interaction and trust, laying a good foundation for later social development in adolescence and adulthood. Initiatives like this will lead to improved outcomes among secondary students later on.’

However, Dr Ryan Valenford, life coach and sports manager, argues that team sports for very young children aren’t necessarily the best approach. Studies from a range of sports academies in Australia and overseas suggest that increasing time spent on non-academic activities, like organised sport, may reduce time available for core subjects, potentially limiting academic achievement.

‘While I would love to see all kids playing team sports, this could lead to less instructional time for critical subjects like reading and maths and science. Many schools lack the resources to organise, teach, coach and develop teams,’ Valenford suggests. ‘Overcrowded classes and limited staff can result in lower quality sports teaching, which would diminish the potential benefits – and there are definite risks in making children participate in teams before they’re ready or even interested. We should look carefully at those risks before taking time away from essential learning.’

Referring to the views and evidence reported, present an argument **for** or **against** the introduction of compulsory participation in team sports in primary schools. In your argument, explain why you reject the alternative view.

**Question 8** (6 marks)

Some people think that social media use should be banned for young people under 16 years old.

The table below contains a summary of research findings about the positive and negative effects of social media. These are not arranged in specific opposition to each other within the table.

Present an argument **for** or **against** banning the use of social media by young people under 16 years old. In your response, identify the finding that best supports your position and explain why it is more relevant or important than one or more of the findings supporting the alternative view.

<b>Findings on the benefits of social media</b>	<b>Findings on the negative effects of social media</b>
75 per cent of social media users reported stronger friendships through social media interactions.	There is a significant correlation between high social media use and increased levels of anxiety and loneliness.
Social media helps people access peer support groups and communities, providing emotional support.	Social media increases exposure to cyberbullying, with negative psychological effects.
Social media fosters creative expression through digital media, such as photography, video and art.	Frequent use of social media, particularly before sleep, disrupts sleep patterns, leading to poor sleep quality.
Social media supports rapid distribution of educational materials, news and research, expanding access to learning opportunities.	The rapid, continuous flow of information on social media contributes to shortened attention span and poorer concentration.
Social media increases awareness of political, environmental and social justice issues.	Social media has a role in amplifying misinformation, which can erode trust in verified information sources.

**Question 9** (4 marks)

Researchers investigated the effects of a new urban parks program in a mid-sized city. They studied five neighbourhoods where new parks were created and five neighbourhoods without new parks, as a control group. Data was collected over two years.

Read the following summary of the research findings and evaluate the claims based on these findings. In your response, identify the claim that is best supported by the findings **and** identify the claim that is least supported. Give reasons for your choices, using evidence from the findings to support your evaluation.

**Research findings:**

- Neighbourhoods with new parks saw a 12 per cent increase in property values, compared to a 3 per cent increase in control neighbourhoods.
- 65 per cent of residents near new parks reported feeling more satisfied with their neighbourhoods.
- There was no significant change in overall crime rates between the two groups of neighbourhoods.
- Air quality measurements showed a 7 per cent reduction in air pollutants in neighbourhoods with new parks.
- Children in neighbourhoods with new parks spent an average of 5 more hours per week in outdoor activities than children in the control group.

**Claims based on these findings:**

- A. New urban parks lead to significant reductions in air pollution across the city.
- B. The urban parks program improves overall quality of life for city residents.
- C. Urban parks are a cost-effective solution to many urban development problems.
- D. Children in neighbourhoods with new parks engage in more outdoor activities.
- E. Creating urban park spaces increases property values in surrounding areas.

SAMPLE

**Question 10** (6 marks)

The following table lists some of the key claims regarding the positive and negative effects of coffee consumption, based on the findings of various studies about the health effects of coffee consumption.

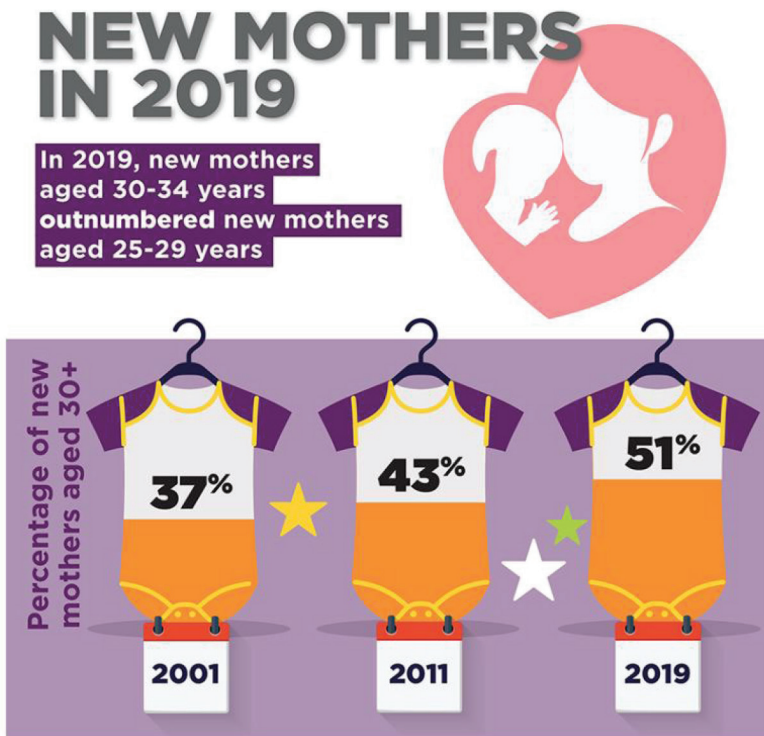
Based on these findings, evaluate the negative health effects of drinking coffee against the health benefits. In your response, identify the most relevant findings, positive and negative, to support your view.

<b>Health benefits of drinking coffee</b>	<b>Negative health effects of drinking coffee</b>
<b>A.</b> Moderate coffee consumption (1–3 cups per day) is associated with improved attention, focus and short-term memory.	<b>F.</b> Coffee consumption can increase feelings of anxiety, jitteriness and restlessness.
<b>B.</b> Long-term coffee consumption may lower the risk of developing Type 2 diabetes by improving insulin sensitivity and regulating blood sugar levels.	<b>G.</b> Drinking coffee can interfere with sleep quality and duration, as caffeine can disrupt the body's natural sleep–wake cycle.
<b>C.</b> Regular coffee consumption may lower the risk of neurodegenerative diseases, such as Alzheimer's disease and Parkinson's disease, by protecting brain cells from damage.	<b>H.</b> Regular coffee drinkers can develop a physical dependence on caffeine, leading to withdrawal symptoms, such as headaches, irritability and fatigue, when they try to give up coffee.
<b>D.</b> Coffee is rich in antioxidants, such as polyphenols, which help fight inflammation and reduce the risk of chronic diseases, such as heart disease and certain cancers.	<b>I.</b> High coffee intake can lead to elevated blood pressure and, in some cases, increased risk of cardiovascular problems.
<b>E.</b> Drinking coffee can improve mood and provide social benefits, as it is often a shared, social activity.	<b>J.</b> Excessive coffee consumption is linked with digestive problems such as acid reflux, heartburn and irritation of the stomach lining.

**Question 11** (6 marks)

Two people have commented on Australian data about the age of mothers when they have their first child, as shown below.

Discuss the extent to which their comments are based on the data provided.

**Person A**

People are waiting longer to get serious about their relationships and decide to have children and by then it's too late to have a large family. This is a matter for concern. We need to get the message through to young people that raising a family is the most rewarding and important thing to do in life. Otherwise, Australia just won't have enough people to sustain our economy.

**Person B**

This trend is a good thing. Young women naturally want to finish their education and establish themselves in their careers, and if they have children those plans are disrupted. No wonder they don't wish to have children as early as their mothers did. And we should be happy that every Australian child can begin life by being wanted and planned for.

Source: L Qu and J Baxter, 'Births in Australia', March 2022, Australian Institute of Family Studies  
<<https://aifs.gov.au/research/facts-and-figures/births-in-Australia>>

**Question 12** (4 marks)

Read the following news article.

**Making a Splash: The Secret Weapon for Boosting Grades**

If you think learning to swim is just a good way of making sure children are safe in the water, think again. A new study suggests it could be the key to unlocking better academic performance across the board.

A group of researchers has found that students in Years 10 and 11 who participated in swimming training for at least one hour per week improved in their overall grades by an impressive 15 per cent compared to those who were not taking part.

Dr Elara Kensington, lead researcher, explains: ‘Our study showed a significant difference in academic performance for those involved in the training. It’s like swimming is a hidden superpower for learning!’

The year-long study compared two groups of students. One group was directed to undertake formal swimming training (such as lifesaving training, team competitions or swimming lessons), and a control group undertook no formal swimming activity. Both groups started with similar academic backgrounds.

Dr Kensington is enthusiastic about this breakthrough: ‘We believe this activity may be able to support and enhance skills that then transfer to other areas of learning. This could change the way we approach education.’

Local school board members are excited, suggesting: ‘This study means we should seriously consider acquiring our own swimming centre and putting a program in place.’

Perhaps tech companies should create some apps to track performance in the pool and in the classroom!

SAMPLE

Based on the research evidence provided, critically evaluate the claims made in the news article.

**Question 13** (6 marks)

Research is needed to inform debate about

- A. reducing the standard working week to four days.
- B. encouraging medical graduates to work in regional and rural areas of Victoria.
- C. encouraging private companies to develop space exploration projects.
- D. reducing the number of vacant housing properties.

Select **one** of these issues (**A–D**) to research.

What would be a good research question to explore the issue you have selected?

How might good evidence be collected to address this research question?

SAMPLE

**Question 14** (6 marks)

Below are five possible research questions (**A–E**).

- A.** How has the growth of online delivery services affected small restaurant businesses in a council area?
- B.** How many hours of sleep per night do Year 12 students need to maximise their level of concentration at school?
- C.** What is the relationship between income and generosity?
- D.** How effective is drinking two cups of green tea per day in improving health outcomes?
- E.** Why have some Australian governments reduced Australia's contribution to foreign aid and development over the past 20 years?

Select **one** research question.

Evaluate the following four aspects of the question:

- its scope and significance
- its likely suitability for a research investigation
- whether investigating it may raise ethical issues
- its likelihood of yielding a useful answer.

SAMPLE

**Question 15** (3 marks)

Below are five possible research questions (**A–E**).

- A.** What are the main causes of a decline in the vaccination rate among Victorian children over the last 10 years?
- B.** Which would be more effective in reducing the rate of staff turnover in the Epwick Early Learning Centre – raising the hourly wage or providing one additional day of paid leave per month?
- C.** What contributes to a happy life?
- D.** How successful has a primary school been in reducing waste over the last two years by banning the use of plastic packaging in school lunches?
- E.** Why have some small butcher shops continued to trade in a specific area, while others have closed down?

Which research question (**A–E**) would be **least** suitable as the basis for a manageable investigation?

Explain why the question would be the least suitable.

SAMPLE

**Question 16** (6 marks)

A primary school council with limited resources has decided to establish a school garden program. A garden will be maintained during school hours by students from two grade levels, with the help of their teachers and some skilled volunteers.

The establishment costs and ongoing maintenance and renewal costs have been estimated.

Although the school council is confident that the program will benefit the students participating, it wants to set up a research project to monitor the educational outcomes after the first and second years, including any negative outcomes. The school council intends to use the research findings to help determine whether such a program should continue in the longer term.

The school council has developed the following research question:

**Do the educational benefits of the school garden program for students in  
Grades 3 and 4 justify the costs of the program?**

Identify:

- the kinds of evidence a researcher would need to look for in order to answer the research question
- any ethical issues that the researcher would need to take into account.

SAMPLE

**Question 17** (3 marks)

Below is a list of possible research questions (**A–E**).

- A.** Is cognitive behaviour therapy (CBT) less effective in reducing symptoms of depression than traditional Chinese medicine combined with conventional Western medical treatments?
- B.** Are individuals from lower socioeconomic backgrounds more likely to experience social isolation in urban areas than those from higher socioeconomic backgrounds in rural and regional centres?
- C.** Does exposure to higher levels of natural ultraviolet (UV) radiation increase the mutation rate in *Drosophila melanogaster* (fruit flies)?
- D.** Does increasing the minimum wage lead to a reduction in employment opportunities for low-skilled workers in urban economies?
- E.** Do students who receive after-school tutoring show higher academic performance in mathematics compared to students of similar mathematical ability who don't receive tutoring?

Select **one** research question.

What method or methods would be best suited to a research investigation designed to answer this question? Explain why this would be the most suitable.

SAMPLE

**Question 18** (6 marks)

Two researchers are investigating the effects of a new after-school reading program on students' reading comprehension. Read the descriptions of their research designs below.

**Design A**

The researcher selects 1000 students from 10 different schools. Half of the students participate in the new after-school reading program, while the other half (a control group) do not. All participants take a standardised reading comprehension test at the beginning of the school year and again at the end. The researcher calculates the change in test scores between the two groups and compares the results.

**Design B**

The researcher selects 20 students participating in the new after-school reading program. Throughout the school year, the researcher conducts monthly in-depth interviews with each student about their experiences in the program. The researcher also observes the reading sessions twice a month, taking detailed notes on student engagement and behaviour.

Evaluate the two research designs to determine which would provide the best data for judging the effectiveness of the after-school reading program.

SAMPLE

**Question 19** (4 marks)

Consider the following research question and proposed design.

**Research question**

How does physical exercise affect memory function in older adults with mild dementia?

**Proposed research design**

A random sample of participants will be given a general health and wellness intervention, which includes physical exercise, dietary changes, social activities, and memory games and mental puzzles. The study will measure overall improvements in health and wellbeing, using self-report and validated scales for energy levels, mood, and general health indicators such as blood pressure and cholesterol levels.

How well does the proposed research design address the research question? In your response, comment on how the design might be improved to address the research question.

SAMPLE

**Question 20** (3 marks)

Below is a list of four research questions (**A–D**).

- A.** Have online delivery services affected small restaurant businesses in regional centres?
- B.** How many hours of sleep per night do Year 12 students need to optimise their ability to concentrate at school?
- C.** What is the relationship between income and generosity?
- D.** How effective is drinking two cups of green tea per day in improving health outcomes?

Select **one** research question.

What potential biases or variables could influence the research, and how might the research be designed to achieve a finding?

SAMPLE