

STUDENT NAME: _____ CLASS: _____



Victorian Certificate of Education
ENVIRONMENTAL SCIENCE
Trial Written Examination 1
August 2020
QUESTION AND ANSWER BOOK

Section	Number of Questions	Number of Questions to be answered	Number of Marks
A	30	30	30
B	8	8	90
Total			120

Materials

- Question and answer book of 25 pages
- Answer sheet for multiple choice questions
- At least one pencil and eraser
- One scientific calculator
- A Graphics Calculator is not allowed

Instructions

- Write your **student name** and **class** in the space provided on this book
- Write your student name and class in the space provided on your answer sheet for multiple-choice
- All written responses must be in English
- Time allowed: 15 minutes reading time, 120 minutes writing time

At the end of the examination

- Place the answer sheet for multiple choice questions inside the front cover of this question and answer book

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Please note this is a practice exam only and its degree of hardship and content is different to the end of year exam. EEV takes no responsibility for your success in completing the actual VCE Environmental Science exam.

Special Thanks to Joanne Board of St Joseph's College Geelong and Melissa Nantsou of Iona College Geelong

SECTION A

Instructions for Section A

Answer all questions in the multiple-choice sheet provided. Write using blue or black pen.

Question 1

Of the following conservation categories, which one represents a species that is least at risk of extinction?

- A. Critical
- B. Vulnerable
- C. Threatened
- D. Endemic

The following information relates to questions 2 - 3.

A Victorian farmer purchased a large property in the Strzelecki Ranges in South Gippsland. The property had several small patches of remnant bushland and a stream running along the south section of the land. When a local officer from the Department of Sustainability carried out a wildlife survey, she discovered two small colonies of the endangered Filmy Maidenhair fern (*Adiantum diaphanum*) growing on rock faces along the stream.

Question 2

As part of the wildlife survey report, the farmer was advised to, if possible, conserve the native remnant patches in the southern area of his land, in order to conserve the habitat of these small, sensitive plants.

This advice would be regarded as:

- A. Anthropocentric
- B. Ecocentric
- C. Biocentric
- D. Species-centric

Question 3

The “endangered” conservation status of the Filmy Maidenhair has been issued as part of the action statement under the *Flora and Fauna Guarantee Act 1988 (Vic)*. This means that:

- A. The remaining Filmy Maidenhair populations are legally protected in Victoria
- B. The remaining Filmy Maidenhair populations are legally protected in all of Australia
- C. It is illegal to trade or sell Filmy Maidenhair specimens in Victoria
- D. It is illegal to trade or sell Filmy Maidenhair specimens in all of Australia

Continue next page

Question 4

Refer to the following photograph that shows a Common Reef Cleaner Wrasse (*Labroides dimidiatus*) alongside a Blue Tang (*Paracanthurus hepatus*). This species of small fish feeds on dead tissue, scales and parasites from the gills and mouth of many larger fish species.



In relation to the Cleaner Wrasse feeding on parasites and dead scales of the Blue Tang, the relationship between these two species can be classified as:

- A. Parasite/ host
- B. Mutualism
- C. Commensalism
- D. Non-symbiotic

Question 5

Human activities like land clearing and industrial agriculture can create pressures on species leading to their extinction.

Which one of the following combinations best describes the size of the gene pool, the susceptibility to extinction and the amount of genetic diversity?

	Size of gene pool	Susceptibility to extinction	Amount of genetic diversity
A.	Small	More susceptible	Low
B.	Large	More susceptible	High
C.	Small	Less susceptible	High
D.	Large	Less susceptible	Low

Continue next page

The following information relates to questions 6 - 7.

The Grey-headed Flying-fox (*Pteropus poliocephalus*) is native to the east coast of Australia, from Rockhampton in Queensland to Melbourne in Victoria. The Grey-headed Flying-fox is vital for the maintenance of a variety of woodland ecosystems.

Question 6

Which of the following is most likely to be the supporting service that Grey-headed Flying-foxes provide to the species of the woodland ecosystems?

- A. Provision of food
- B. Purification of air
- C. Soil microbiome maintenance
- D. Seed dispersal

Question 7

Recently, several populations of the Grey-headed Flying-fox have become isolated from one another due to the severe 2020 bushfires. One proposal, aimed at managing the reintroduction of these isolated populations, includes the rehabilitation of degraded and burnt roosting sites.

Which of the following describes a potential impact if this management strategy is unsuccessful?

- A. A reduction of genetic diversity within the isolated Grey-headed Flying-fox populations due to inbreeding
- B. A risk of genetic swamping when the Grey-headed Flying-fox comes into contact with other species of Flying-fox
- C. An overall reduction of Flying-fox species diversity along the east coast of Australia
- D. The formation of 'mega-diverse' regions of woodland due to the habitat fragmentation caused by the bushfires

Question 8

Ecologists are monitoring a critically endangered Flying-fox species on an island off the coast of Australia. They are carefully monitoring 2 small populations (Population A and Population B) that are in rapid decline due to habitat destruction and changing climatic conditions resulting in severe weather. An ecologist estimates that the probability of extinction in the next 15 years to be 0.20 for Population A and 0.60 for Population B.

The probability of both species becoming extinct within the next 15 years is:

- A. 0.12
- B. 0.40
- C. 0.80
- D. 1.20

Continue next page

Question 9

To estimate the size of the population of Purple-mottled Shore Crab (*Cyclograpsus granulatus*) on a section of rocky shore, a group of environmental science students are collecting data using the mark-recapture method. They captured, marked and released 75 crabs on the first day. Two days later, they captured 56 crabs, of which 35 had been marked. What is the best estimate of the population of the Purple-mottled Shore Crab on the section of rocky shore?

- A. 54
- B. 96
- C. 120
- D. 166

Question 10

As part of her field study, an environmental science student has chosen to investigate the species diversity of invertebrates on a rocky shore close to her home. Which of the following would not be an appropriate step in her method?

- A. Place the measuring tape in a straight line, running from the beginning of the water, until the beginning of the sand dunes
- B. Choose four areas along the tape measure to place the quadrats. Ensure to choose areas that have a wide variety of invertebrates
- C. Choose four random areas along the tape measure to place the quadrats
- D. In a results table, document species name and number within each quadrat

Question 11

Genetic testing has identified that there are three distinct Dingo populations on mainland Australia. The South-eastern, the North-western and the Fraser Island population. The Fraser Island Dingoes show a lesser degree of genetic diversity. This is an example of:

- A. Genetic swamping
- B. Genetic drift
- C. Inbreeding
- D. Extinction

Question 12

Deforestation is the permanent destruction of forests in order to make the land available for other use such as industrial agriculture. This process impacts which of the following of the Earth's spheres?

- A. Biosphere, lithosphere and atmosphere only
- B. Hydrosphere, atmosphere and biosphere only
- C. Lithosphere, biosphere and hydrosphere only
- D. Biosphere, hydrosphere, atmosphere and lithosphere

Continue next page

The following information relates to questions 13 and 14.

Vanuatu is an island nation in the South Pacific Ocean. It is made of an archipelago of 83 islands and its capital city, Port Vila, is home to a large harbour in which international and local shipping traffic regularly passes through.

Recently, fisheries managers noted a large number of Parrotfish (a large reef fish) were being killed by boat traffic in a section of Port Vila bay that passes through the reef at low tide. To reduce the number of animals being killed, they considered erecting floating buoy signs to warn boaters of the danger of travelling at low tide.

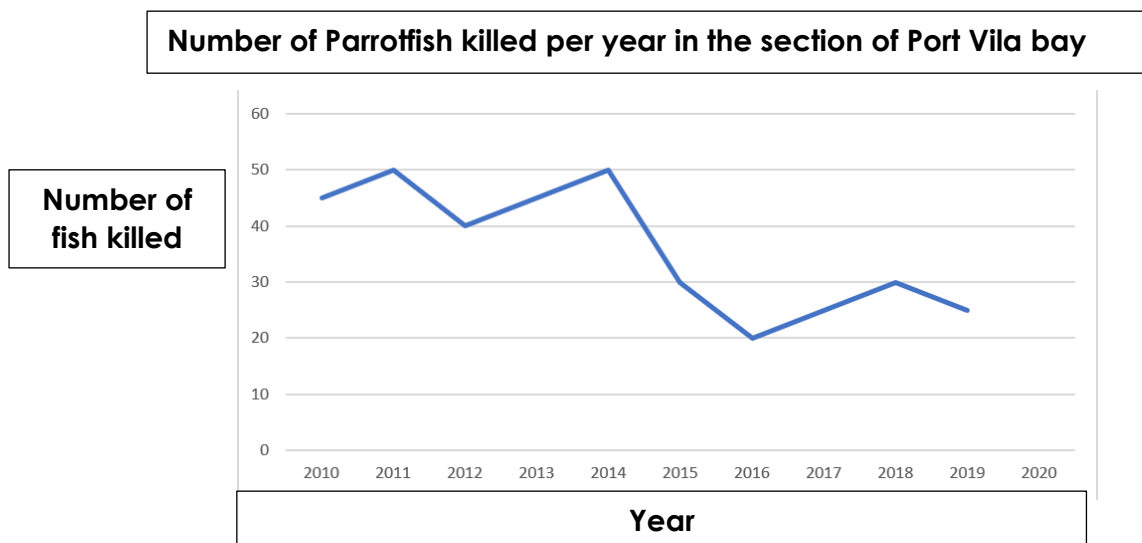
Question 13

In 2014, the managers had no evidence that the Parrot fish killed in the bay actually reduced the overall populations of Parrotfish. However, they decided to erect floating signs anyway to reduce any possible effects that these deaths might have on the Parrotfish populations.

This is an example of:

- A. Managing an introduced species
- B. Applying the precautionary principle
- C. Conducting a risk assessment
- D. Management of habitat destruction

The figure below shows the number of Parrotfish killed each year in this section of the bay before and after the warning signs were erected at the end of 2014



Question 14

In the period after the road signs were erected, 2015-2019 inclusive, the total number of Parrot fish killed was

- A. 110
- B. 120
- C. 130
- D. 140

Question 15

A local dairy farm is planning to release effluent, which includes liquid waste and sewage from the farm, into a nearby river. The outlet will feed the liquid waste into the river, which flows constantly during the year, during non-drought years. The wastewater will include nutrients from effluent, fertilizers, waste milk and cleaning products.

The local town council states that the wastewater outlet must be ecologically sustainable.

This means that the project must:

- A. Not affect the ecology of the nearby ocean area in any way
- B. Meet the needs of the current population without compromising the needs of future generations by maintaining good environmental health
- C. Take into account the effects on the nearby human population
- D. Maintain the biodiversity of the nearby riparian area

Question 16

Which of the greenhouse gases contributes most to the **enhanced greenhouse effect**?

- A. Carbon dioxide
- B. Water vapour
- C. Methane
- D. Nitrous oxide

Question 17

Identify the list that only contains renewable resources.

- A. Vegetable, wool, diamonds, water
- B. Steel, coal, diamonds, plastic
- C. Paper, wool, vegetables, water
- D. Plastic, natural gas, cotton, paper

Question 18

The One Lead Mine is an open-pit lead mine in the tropical north of Queensland. Which of the following is potentially the most serious environmental threat from this mine?

- A. Greenhouse gas emission
- B. Pollutants entering local waterways due to production operations
- D. Collapse of mine shafts
- C. Tailings dam leaking during the summer wet season

Continue next page

Question 19

Identify the renewable energy resource best suited to providing a base load for a reliable electrical energy supply.

- A. Geothermal
- B. Solar electrical
- C. Nuclear fusion
- D. Wave generation

Question 20

Identify the name given to resources and processes that are supplied by nature for the benefit of humanity.

- A. Biodiversity
- B. Ecosystem services
- C. Biota
- D. Biomass

Question 21

Clear felling a large area of rainforest:

- A. Reduces rainfall
- B. Improves soil quality
- C. Increases the reliability of rainfall
- D. Increases the diversity of plants and animals.

Question 22

Ocean acidification is mostly caused by:

- A. Pollution from major cities
- B. Increased amounts of dissolved carbon dioxide
- C. Decreases amounts of dissolved carbon dioxide
- D. Acid released in underground volcanic eruptions

Question 23

The Carbon biogeochemical cycle is an example of:

- A. Regulation service
- B. Provisioning service
- C. Supporting service
- D. Generative Service

Continue next page

Question 24

The main difference between weather and climate is:

- A. The factors that are measured
- B. The time frames they are viewed over
- C. The size of the areas effected
- D. None of the above

Question 25

Peak oil can be considered when:

- A. Oil becomes more available
- B. Oil becomes less available
- C. Oil becomes more expensive
- D. Both B and C

Question 26

Warm water is blown against Australia and Indonesia. This results in increased ocean evaporation, leading to greatly increased rainfall in these places. This is a description of:

- A. Thermohaline circulation
- B. Indian Ocean Dipole
- C. El Niño
- D. La Niña

Question 27

Identify the effect that rotation of the Earth on its axis has on oceans and atmosphere.

- A. Coriolis
- B. Albedo
- C. Walker cell
- D. Hadley cell

Question 28

What would be the effects if the ozone layer were destroyed?

- A. El Niño would become more extreme
- B. Earth's albedo would decrease
- C. Increased risk of skin cancer
- D. Coriolis effect would become stronger

Question 29

In the migration season, birds in the Southern Hemisphere were captured and placed in cages, each with a large compass drawn on the floor. The direction in which the birds hopped was measured over a 24hr period. At the end of the experiment it was found that most of the birds hopped due north.

Identify the independent variable in the scenario above:

- A. Direction in which the birds hopped
- B. Variety of bird species used for the investigation
- C. The compass drawn on the floor
- D. The cages in which the birds were kept

Question 30

An environmental scientist setting up a catch and release data collection point a short distance from a car park. This was because of the amount of equipment that is required to carry. This is an example of:

- A. Accurate data collection
- B. Validity data collection
- C. Experimental bias
- D. Good field data practice

End of Section A

SECTION B

Instructions for Section B

Answer all questions in the spaces provided. Write using blue or black pen.

Question 1 (14 marks in total)

Melissa is a conservation scientist employed by the Department of Environment, Land, Water and Planning. She is studying the effect of the 2020 bushfires on the diversity of marsupial species in mountain areas of central and eastern Victoria. Melissa has collected data from two woodland sites (site A and site B) using the mark-recapture method. Site A contains the Leadbeater's Possum (*Gymnobelideus leadbeateri*) that is listed by the *Environment Protection and Biodiversity Conservation Act 1999* (Australia) as critically endangered. The lowland population estimates are less than 40 individuals meaning the species is at very high risk of extinction. The Leadbeater's Possum live in the wild in colonies of up to 12 individuals but only one pair per colony will breed. There have been attempts at captive breeding programs but there have been no individuals breed in captivity to date.

To inform the management strategy for the area, Melissa must use the Simpson's Index of species diversity (D) to quantify the marsupial diversity of each of the eucalyptus woodland sites. The index (D) can be calculated as follows:

$$\text{Simpson's Index: } D = 1 - \frac{\sum[n_i(n_i - 1)]}{N(N - 1)}$$

Note: $\sum$ refers to the 'sum of'

n_i means the total number of organisms of each individual species

N means the total number of organisms of all species

A higher index value indicates a greater species diversity.

Species recorded at site A	n_i	$n_i - 1$	$n_i (n_i - 1)$
Common Brushtail Possum	35	$35 - 1 = 34$	$35 \times 34 = 1190$
Common Ringtail Possum	34	$34 - 1 = 33$	$34 \times 33 = 1122$
Leadbeater's Possum	7	$7 - 1 = 6$	$7 \times 6 = 42$
Yellow-bellied Glider	7	$7 - 1 = 6$	$7 \times 6 = 42$
Sugar Glider	25	$25 - 1 = 24$	$25 \times 24 = 600$
Feathertail Glider	23	$23 - 1 = 22$	$23 \times 22 = 506$
Eastern Pygmy-possum	5	$5 - 1 = 4$	$5 \times 4 = 20$
N =	136		$\sum[n_i (n_i - 1)] = 3522$
$N(N - 1)$	18 360		

Therefore

$$D = 1 - \frac{\sum[n_i(n_i - 1)]}{N(N - 1)}$$

$$D = 1 - \frac{3522}{18\,360}$$

$$D = 1 - 0.192$$

$$D = 0.808$$

Simpson's Index (D) for site A is 0.808

- a)** Use the figures in the table below and the spaces provided to calculate Simpson's Index (D) for Site B.
(3 marks)

Species recorded at site b	n_i	$n_i - 1$	$n_i (n_i - 1)$
Common Brushtail Possum	54		
Common Ringtail Possum	30		
Leadbeater's Possum	0		
Yellow-bellied Glider	6		
Sugar Glider	12		
Feathertail Glider	12		
Eastern Pygmy-possum	5		
N =			$\Sigma[n_i (n_i - 1)] =$
$N(N - 1)$			

Therefore

$$D = 1 - \frac{\Sigma[n_i (n_i - 1)]}{N(N - 1)}$$

$$D = 1 -$$

$$D = 1 -$$

$$D =$$

Simpson's Index (D) for site B is

- b)** Using your Simpson's Index (D) figures, justify whether site A or site B has a higher species diversity.
(2 marks)

- c) What is the mark-recapture method and why was this technique used to collect marsupial species data in these woodland ecosystems? (2 marks)

- d) i. Explain what is meant by the term species richness.
(1 + 2 = 3 marks)

- ii. Using data from site A and site B, compare the species richness of these two sites.

- e) A concern Melissa has for Victorian marsupial species is a loss of genetic diversity as a result of the 2020 bushfires. State the meaning of genetic diversity. (1 mark)

- f) Explain which site, A or B, requires intensive conservation efforts by scientists.
(1+1+1 = 3 marks)

Continue next page

Question 2 (6 marks in total)

In 2012, Healesville Sanctuary rescued the last three individuals from the Lake Mountain population after bushfire destroyed a population of around 300 Leadbeater's Possum in 2009. The three individuals were rescued after a feral cat was seen hunting around their nest boxes. These individuals did not produce offspring and are currently on display at Healesville Sanctuary. There are three main threats to wild populations of Leadbeater's Possum: 1) loss of hollow bearing trees, 2) wildfire and 3) restricted distribution.

- a)** Give a possible reason why the Leadbeater's Possum did not reproduce in captivity.
(1 mark)

- b)** Justify your opinion as to whether it was ethical to remove these individuals for captive breeding purposes.
(2+2 = 4 marks)

- c)** Identify the most appropriate reintroduction method for the Leadbeater's Possum into the wild.
(1 mark)

Continue next page

Question 3 (12 marks in total)

The Hooded Plover (*Thinornis cucullatu*) is a small, coastal dwelling species of bird endemic to Australia. This species inhabits ocean beaches, especially those with extensive open dunes.

The Great Ocean Road Coastal Committee is a volunteer group that manages the conservation of Hooded Plover breeding sites along the south-western Victorian coastline from Whites Beach in Torquay to Moggs Creek.

Conservation strategies put into place to support the survival of these birds include: banning of dogs from dune areas where populations are known to nest, fencing off nesting areas during breeding season and the education of locals via signs and social media campaigns.



Photo credit: Great Ocean Road Coastal Committee

- a) A major threat to the Hooded Plover populations in Victoria is low breeding success. Discuss how nesting in dunes, that back onto sandy beaches, can lead to low survival rate of hooded plover chicks. (3 marks)

- b) Currently the Hooded Plover is listed as vulnerable on the International Union for Conservation of Nature (IUCN) red list. Explain what this conservation status means in terms of assessment of the remaining population of hooded plovers. (2 marks)

- c) Suggest and explain one other conservation strategy that could be implemented to maintain and grow the populations of Hooded Plovers in Victoria. (2 marks)

Continue next page

- d) The Hooded Plover has been listed in the *Victorian Flora and Fauna Guarantee Act*. Outline the benefits of being listed as part of this regulatory framework. (2 marks)

- e) The COVID-19 pandemic of 2020 has had a financially negative impact on the hospitality and tourism industries. The local Shire tourism minister has suggested a strategy to encourage greater numbers of tourists to the Ocean region. The strategy involves publishing the location of Hooded Plover nesting sites and allowing bird watchers and nature photographers access to the nesting sites.

Is this idea based on anthropocentric or ecocentric values? Justify your answer, making clear distinction between these two terms. (3 marks)

Question 4 (13 marks in total)

The Galilee Basin, in inland western Queensland, is an area that covers approximately 247,000km². The area holds significance for multiple indigenous groups as well as being home to a variety of local endemic plant and animal species. A variety of ecosystem types exist in the area including tussock grasslands and open woodlands. The Galilee Basin also contains a complex pattern of rivers, wetlands and inland lakes that provide a diverse range of ecosystem services.

In 2019, Australian federal and Queensland governments approved construction of both an open-cut and underground coal mining project by an international energy company, Adani Power Limited.

When construction is complete, Adani Power Limited plan to mine coal from the Galilee Basin, transport the coal to a power station being built in Godda, India and burn the coal to provide energy for thousands of people in north-western India.

More than 1500 jobs have been created in engineering and construction of the mine as well as thousands more indirect jobs as a result of the mine's development. The Queensland government estimates the generation of billions of dollars in the first 30 years of the mine's operation.

The proposal includes transportation of coal via the Great Barrier Reef aboard huge ocean tankers on its journey to India.

- a) In the table on the following page, justify whether the Adani Power Limited mine should be considered as ecologically sustainable development. Consider both positive and negative impacts. As part of your answer consider 2 of the sustainability principles. (2+1+1 = 4 marks)

	Social	Economical	Environmental
Positive			
Negative			

- b)** Name one group of stakeholders that may hold interest in this project and outline their role. (3 marks)

- c)** There are four challenges to sustainability. Identify which challenge this project address and justify your response? (2 marks)

- d)** A key transport option for the project is via a channel through the World Heritage listed Great Barrier Reef. Describe 2 key management strategies principles to ensure the safety of this transport method. (2 marks)

- e)** Describe one impact that the Adani Power Limited mine project will be having on the hydrosphere within the Galilee Basin. (2 marks)

Question 5 (13 marks in total)

The Ranger uranium mine officially opened on the 1st of October 1981 under controversial circumstances and has operated continuously until the present time. Controversy arose when the mines proposed site would be within the World Heritage listed Kakadu National Park. Kakadu National Park encompasses a precious natural heritage. It protects valuable ecosystems of outstanding value, diversity and beauty and contains the world's richest breeding grounds for migratory tropical water birds. The boundaries of Kakadu National Park were drawn around the Ranger uranium mine site through a series of political and administrative negotiations. In addition to the mine's exclusion from Kakadu, it was also excluded from the requirements of the Aboriginal Land Rights Act that would have otherwise given the Mirarr people the right to say no to the mine. The permit for the mine was granted to Rio Tinto for the length of 40 years therefore mining will cease in early 2021.

- a)** Describe two potential threats to biodiversity created by this project. (2 marks)

- b)** Explain how the Ranger uranium mine project demonstrated a lack of environmental justice. (3 marks)

c) The process of mining uranium at the Ranger uranium mine involved a large open pit mine. In 2021 the mine will cease operation as per the terms of its original permit. Energy Resources of Australia and Rio Tinto will then begin a five-year project to rehabilitate the Ranger uranium mine. The mine must be restored to a standard that would allow it to be incorporated within the surrounding Kakadu National Park.

- i)** Explain why uranium is considered a non-renewable energy source. (2 marks)

- ii)** Name the three key modes of mine rehabilitation and give examples of how each would apply to the rehabilitations of the Ranger site. (6 marks)

Question 6 (13 marks in total)

Australia is made up of states and territories all of which are governed by three levels of government: Federal, State and Local. Only in the last 30 years have all the levels of government worked together and agreed on a set of laws and regulations to maintain environmental protections. One of those regulations is the need for developers to implement an Environmental Impact Statement (EIS).

- a)** An EIS is an example of what type of development? Justify your answer. (3 marks)

Victoria's West Gate Tunnel development in the Western metropolitan region of Melbourne is currently in a legal battle between the State Government and the construction company. Whilst digging the tunnel, the construction company has dug up contaminated soil and are asking the State Government for more money to safely dispose of the soil.

- b)** Is this an example of the user-pays sustainability principle? Justify your response. (2 marks)

- c)** Road transport has been a major contributor to CO₂ emissions globally. In an attempt to reduce the impact of atmospheric CO₂ emissions, technologies to advance carbon sequestration have been developed. Name 3 types of carbon sequestration and justify the use of one of the types as long-term solution. (5 marks)

- d)** Building freeways through populated urban areas provides multiple challenges. Identify one of those challenges and suggest an alternative to freeway construction including how it will assist with the impacts of the enhanced greenhouse effect. (3 marks)

Question 7 (4 marks in total)

The Earth's climate is a solar powered system. Globally, over the course of the year, the Earth system - land surfaces, oceans, and atmosphere - absorbs an average of about 240 watts of solar power per square meter (one watt is one joule of energy every second). The absorbed sunlight drives photosynthesis, fuels evaporation, melts snow and ice and warms the Earth system. For Earth's temperature to be stable over long periods of time, incoming energy and outgoing energy have to be equal. This balance is known as earth's energy budget.

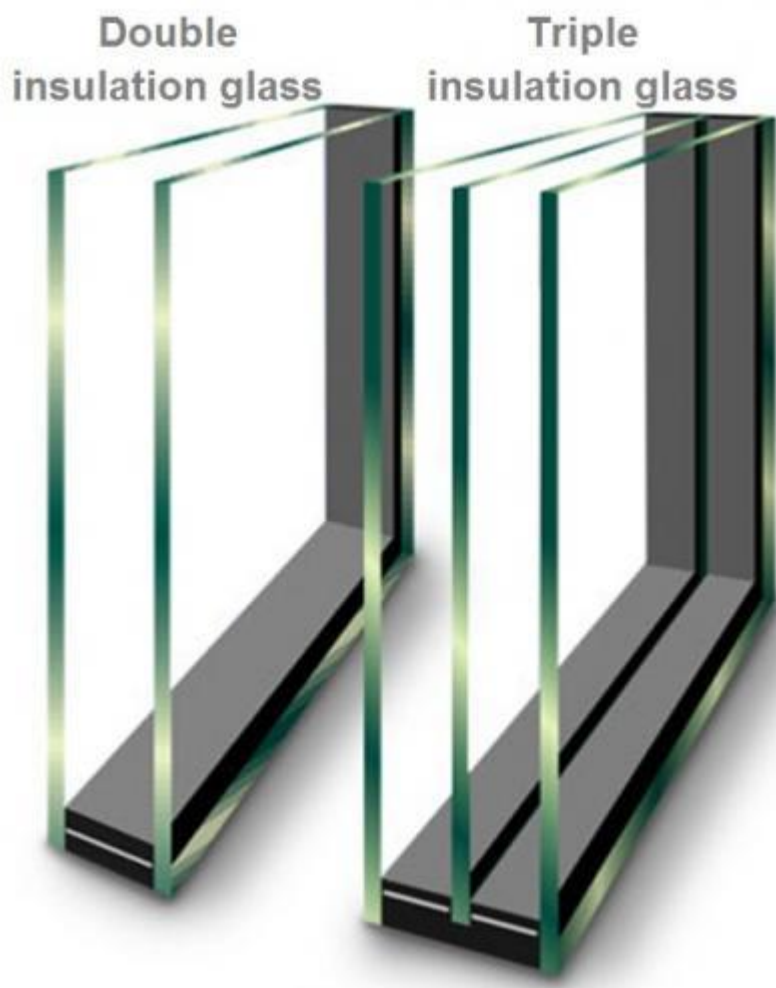
a) Justify whether the radiation reflected by clouds is part of the energy budget and name the term used to describe this phenomenon. (2 marks)

b) Describe the impact of melting ice caps on earths energy budget and justify how this would affect the enhanced greenhouse effect. (2 marks)

Continue next page

Question 8 (15 marks in total)

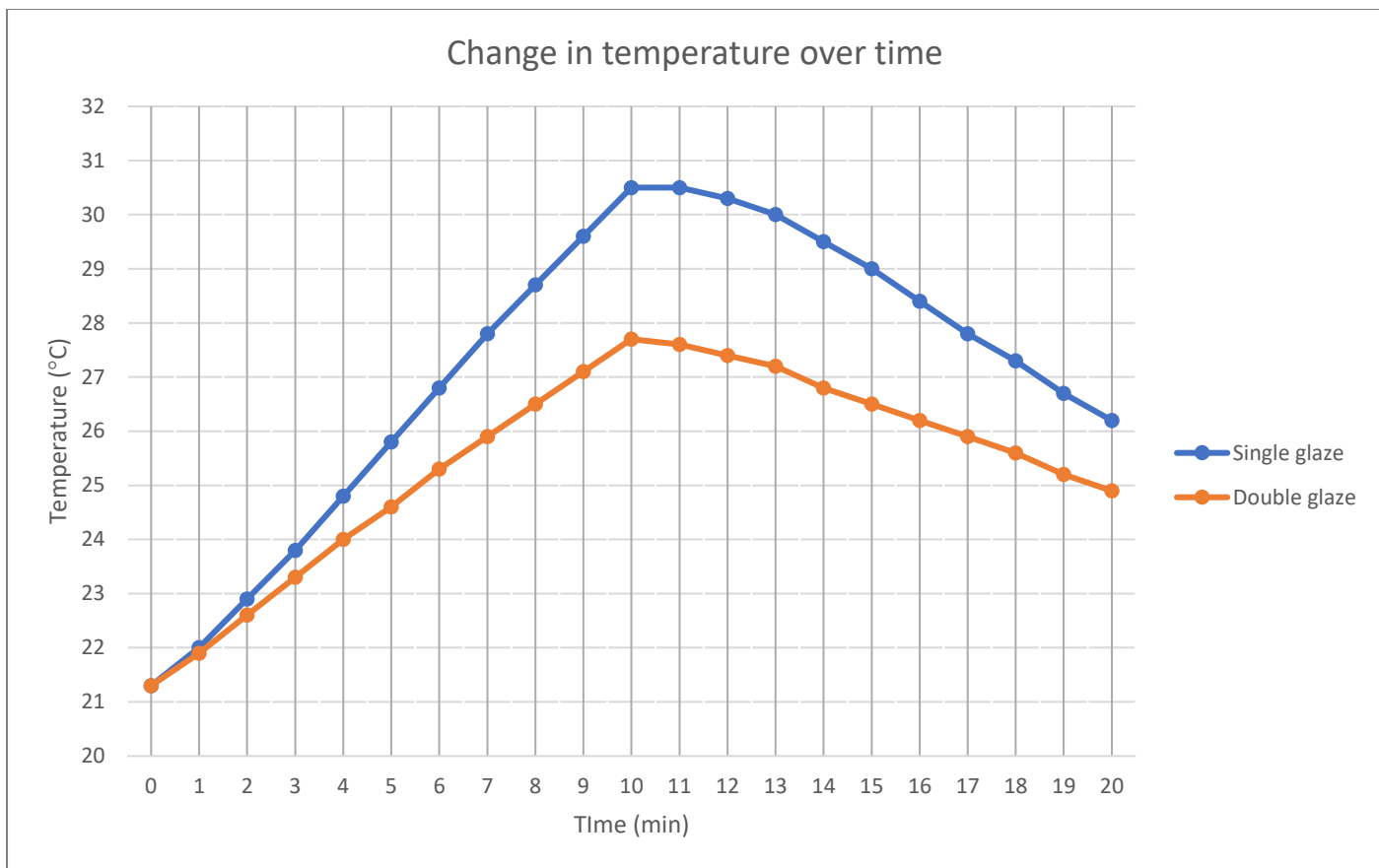
One way for buildings to be more energy efficient is to use double or triple-glazing in glass windows or doors. Double and triple-glazing consists of two or three panels of glass separated by a spacer. The space between the panels is usually filled with Argon gas which is a poor conductor of heat. These panels of glass and gas filled spaces are then all sealed within the window frame. The diagram below shows the cross-section for double and triple-glazing.



A group of students conducted an experiment where they investigated the effect of single and double-glazed windows on the inside temperature of a simulated house. Two house simulations were set up, one with a single plastic panel (single-glazed), and one with two plastic panels with a gap of trapped air between the panels (double-glazed).

The students hypothesised that the single-glazed 'house' would heat up and cool down quicker than the double-glazed 'house', and the double-glazed house would retain its temperature longer than the single-glazed 'house'.

Three cubes were constructed, with five sides having white plastic panels to simulate walls, floor and roof with one side having a clear plastic panel. Cube One had one clear plastic panel and Cube Two had 2 clear plastic panels with a sealed gap between the panels. A temperature probe was installed inside each cube. A heat lamp was placed 12 cm away from the clear plastic side and was angled to ensure the heat was directed onto the base of the cube. The initial temperature of each cube was recorded and then each minute after the lamps were turned on. After 10 minutes, the lamps were turned off and the internal temperature was continued to be recorded for another 10 minutes. The results of the investigation are shown on the next page.



a) State the independent variable used in this experiment. (1 mark)

b) Did the students collect qualitative or quantitative data? Make clear the difference between the two terms. (3 marks)

c) What was the overall change in temperature for each of the cubes: (2 marks)

Single-glazed: _____

Double-glazed: _____

d) Identify which is the controlled variable? Indicate one example of a controlled variable in this experiment. (2 marks)

e) Was the students' hypothesis supported? Explain using appropriate data. (3 marks)

f) Explain one way to ensure that the data collected is reliable. (2 marks)

g) Describe one benefit of installing double-glazing in glass doors and windows in residential housing? (2 marks)

END OF EXAM

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Victorian Certificate of Education
ENVIRONMENTAL SCIENCE

Trial Written Examination 1

August 2020

ANSWER SHEET

Fill the correct box

	a	b	c	d		a	b	c	d
1					16				
2					17				
3					18				
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5					20				
6					21				
7					22				
8					23				
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