



# Western Australian Certificate of Education Examination, 2010

## Question/Answer Booklet

### INTEGRATED SCIENCE

### 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  
Formulae and Data Sheet

#### *To be provided by the candidate*

Standard items: pens, pencils, eraser, correction fluid/tape, ruler, highlighters

Special items: non-programmable calculators satisfying the conditions set by the Curriculum Council for this course

### 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	30	20	20
Section Two: Short response	5	5	90	100	50
Section Three: Extended response	2	2	60	60	30
<b>Total</b>					100

## Instructions to candidates

- The rules for the conduct of Western Australian external examinations are detailed in the *Year 12 Information Handbook 2010*. 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, do not erase or use correction fluid, and shade your new answer. 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(s) 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, do not erase or use correction fluid, and shade your new answer. 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: 30 minutes.

---

1. Which one of the following is **not** a reason why an Environmental Impact Assessment is conducted by a mining company?
  - (a) to identify and protect plants and animals, particularly endangered species
  - (b) to determine how big the mine will be and how much money it will make
  - (c) to assist with community consultation
  - (d) to identify and preserve important cultural heritage sites
  
2. One of the first steps undertaken when mining for bauxite in the Darling Range is to remove the top soil. It is then stored until required. Which one of the following statements best describes why this top soil is stored?
  - (a) It is bagged and sold to gardeners as a way to increase profit margin.
  - (b) It serves as a reservoir for seed in the rehabilitation process.
  - (c) It is used to provide landfill when the mine closes.
  - (d) It provides a valuable source of gravel to be used in road construction in Western Australia.
  
3. Which one of the following, mined in Western Australia, **does not** use strip mining as a method for extracting ore from the ground?
  - (a) bauxite
  - (b) mineral sands
  - (c) coal
  - (d) iron ore
  
4. 'Personal protective equipment' is the name used to describe standard safety equipment for a range of workplaces. It includes the following items:
  - I hard hats
  - II steel-capped boots
  - III safety glasses
  - IV ear plugs
  - V laboratory coats

Which one of the following best describes the safety equipment you might be required to use if you were to visit a mine site for a day?

  - (a) I, II, III and IV only
  - (b) II, IV and V only
  - (c) I, II, III and V only
  - (d) II, III and IV only

See next page

5. Some metals can be extracted by electrolysis of a solution of their ions. For a given metal, which one or more of the following factors will affect the mass of the metal deposited?
- I the current used
  - II the time taken for the electrolysis
  - III the charge on the ion
- (a) II only
  - (b) III only
  - (c) I and II only
  - (d) I, II and III
6. Which one of the following is **not** a substance used in the extraction of aluminium metal?
- (a) water
  - (b) alumina
  - (c) cryolite
  - (d) carbon
7. The Australian Government initially implemented an electrical appliance energy rating scheme using a six-star rating system. Today, a ten-star rating system is being used for refrigerators. Why would a new star rating system be required?
- (a) Consumers will understand a 0 to 10 scale better than a 0 to 6 scale.
  - (b) Too many appliances were not meeting the old standards so a new standard was devised.
  - (c) The system needed to change as the cost of electricity increased.
  - (d) Technological advances mean that appliances are becoming more energy efficient.
8. 'Fossil fuels' is a term used to describe the energy sources that formed from living matter that died millions of years ago. Freshly-harvested plant matter can also be used as a fuel source. What is the general name given to this type of fuel?
- (a) organic energy
  - (b) biomass
  - (c) geothermal energy
  - (d) wood
9. Nuclear fission is the process by which
- (a) heavy nuclei are split, resulting in the release of energy.
  - (b) heavy nuclei are split, resulting in the absorption of energy.
  - (c) light nuclei are joined together, resulting in the release of energy.
  - (d) light nuclei are joined together, resulting in the absorption of energy.

10. Which one of the following statements about nuclear power plants is **incorrect**?
- (a) No carbon emissions are produced during electricity production.
  - (b) The steam towers are used to release excess radiation into the atmosphere.
  - (c) The main purpose of the reactor is to produce heat that can boil water.
  - (d) They produce radioactive waste that requires safe storage for thousands of years.
11. When designing an experiment, it is important that scientists take into consideration the manipulation of certain variables. The type of variable that would be observed and recorded in the experiment is referred to as the
- (a) independent variable.
  - (b) measured variable.
  - (c) dependent variable.
  - (d) controlled variable.
12. A 240 g sample of cassiterite ( $\text{SnO}_2$ ), an ore of tin, was extracted from a mine site in Western Australia. Chemists carried out some tests on a sample of the ore and then extracted 79.8 g of tin. Allowing for a loss of about 2% by mass during the chemical extraction process, what is the percentage yield of tin in this ore sample to the nearest whole number?
- (a) 98%
  - (b) 33%
  - (c) 31%
  - (d) 34%
13. CSIRO Exploration and Mining have been investigating a new method of prospecting for mineral deposits such as gold by using termites. Which one of the following is most likely to be the reason why termites might be useful in helping to locate buried gold?
- (a) Termites are top order consumers and gold accumulates in their bodies due to their food sources.
  - (b) Termites need small concentrations of gold to grow exoskeletons in much the same way that humans need calcium for our bones.
  - (c) Termite populations are found in particular vegetation types that are typically associated with gold bearing geological formations.
  - (d) Termites use mud and clay from deep underground to build their nests, known as 'mounds', and this clay contains gold.

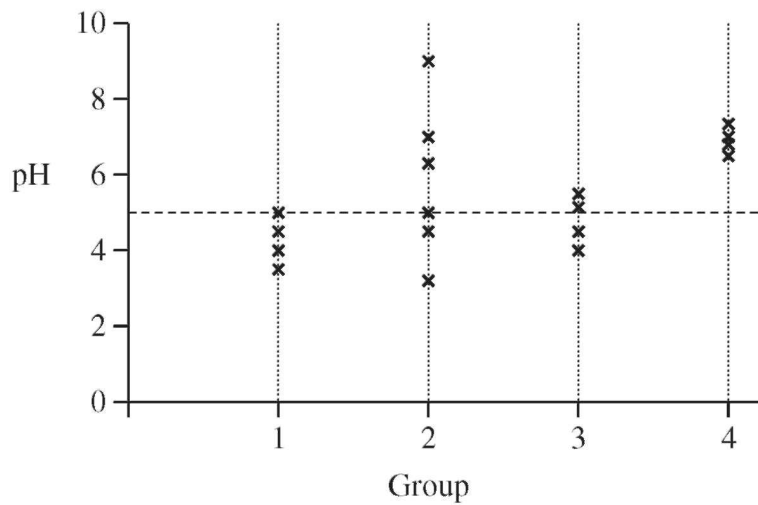
The following information relates to questions 14, 15 and 16

After cooking toast for breakfast you turn over the toaster and see the following information:



14. How much current does the toaster draw when it is being used?
- (a) 6.25 A
  - (b) 240 V
  - (c) 7500 J s<sup>-1</sup>
  - (d) 7500 A
15. If a piece of toast takes 5 minutes to cook, what is the approximate cost of cooking it if the price of electricity is 22 cents per kWh?
- (a) 1c
  - (b) 2c
  - (c) 3c
  - (d) 4c
16. If a teaspoon fell into the toaster, halving the resistance, what would the new power output be?
- (a) 750 W
  - (b) 1500 W
  - (c) 2250 W
  - (d) 3000 W

17. A class was divided into four groups to measure the pH of ground water near a mine site. Each group took multiple readings. A sample was also submitted to a laboratory for accurate analysis. The pH was determined by the laboratory to be 5.0.

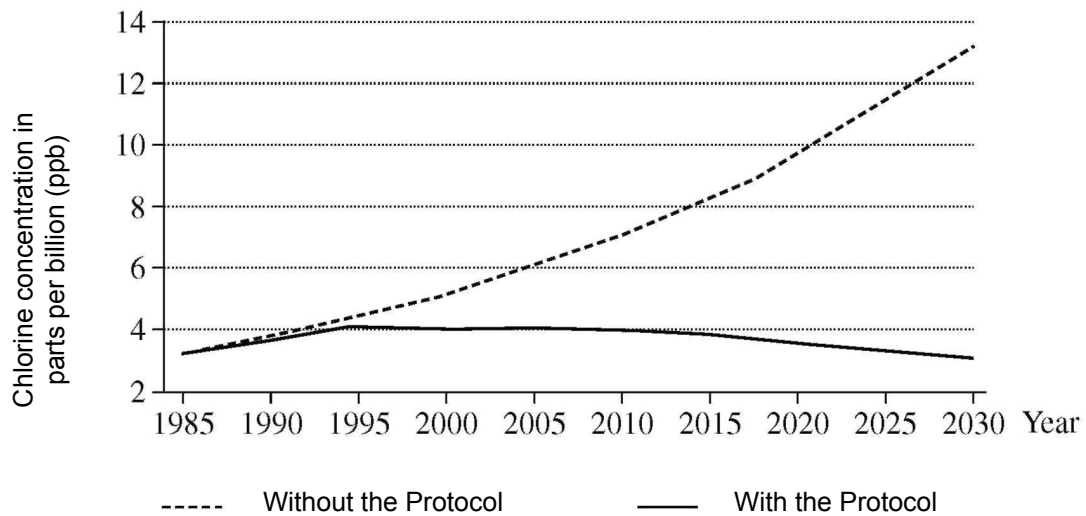


The results of the four groups are shown in the graph above.

Based on the laboratory's official reading, which group's results are the most accurate and precise?

- (a) Group 1
- (b) Group 2
- (c) Group 3
- (d) Group 4

18. The graph below shows the predicted effects of implementing the 1990 Montreal Protocol controls on chlorine concentration in the stratosphere.



- Which one of the following statements is supported by the information in the graph?
- (a) Chlorine concentrations will increase by 13 ppb between 1985 and 2030 without the implementation of the Protocol.
  - (b) Chlorine concentrations will decrease by 25% between 1995 and 2030 with the implementation of the Protocol.
  - (c) Protocol implementation will result in chlorine concentrations returning to 1985 levels by the year 2015.
  - (d) Implementing the Protocol will lead to chlorine concentrations in 2030 being 13 ppb lower than if the Protocol is not implemented.
19. Which one of the following is the largest source of greenhouse gas emissions?
- (a) fires in the Amazon rainforest
  - (b) the melting of glaciers in the Arctic and Antarctic
  - (c) fossil fuels used to generate electricity
  - (d) waste disposal in rubbish tips and sewage treatment plants
20. Electricity can be generated at different voltages, depending on the method used to produce it. Substations convert the voltages produced at power stations to high voltages, such as 330 000 V, which can then be transmitted long distances between power stations and cities. Substations on the outskirts of cities lower the voltage before it is distributed throughout suburbs along power lines located above or below ground.

The reason that the voltage is first raised and then lowered is to

- (a) allow electricity to be transmitted faster.
- (b) minimise electricity being wasted as heat during transmission.
- (c) provide more energy for an increasing population.
- (d) prevent arcing between power lines in suburban areas.

**End of Section One**

**See next page**



**This page has been left blank intentionally**

**See next page**

**Section Two: Short response**

**50% (100 Marks)**

This section has **five (5)** questions. Answer **all** questions. Write your answers in the space 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(s) that you are continuing to answer at the top of the page.

Suggested working time: 90 minutes.

**Question 21**

**(15 marks)**

Fire can have a significant role in the germination of plants, including Australian native plants, either as a result of the effect of heat on seeds or the effect of smoke.

For example, scientists have discovered that smoke stimulates the germination of a plant called *Audounia capita*. Since that time, investigation of the benefits of smoke-mediated germination has been of particular interest to the people responsible for rehabilitating mine sites in Australia.

Scientists have discovered that:

- Smoke can promote earlier and more uniform germination under controlled greenhouse and laboratory conditions.
- Smoke dissolved in water ('smoke water') is effective in promoting seed germination.
- High doses of smoke water can inhibit germination of many species.

Imagine you are a researcher working for a mining company. You have found a variety of research papers recommending different times that seeds should be exposed to smoke water. Some articles on the subject recommend an exposure of two hours and others up to two days as being the most suitable time for maximum germination.

You are to investigate the ideal time that a certain native plant seed needs to be exposed to smoke water in order to attain the greatest percentage of germination.

- (a) Write an hypothesis for this experiment. (1 mark)

---



---



---

- (b) Identify the independent variable. (1 mark)

---

- (c) Identify the dependent variable. (1 mark)

---

- (d) Identify **three (3)** variables that you would need to control. (3 marks)

One: \_\_\_\_\_

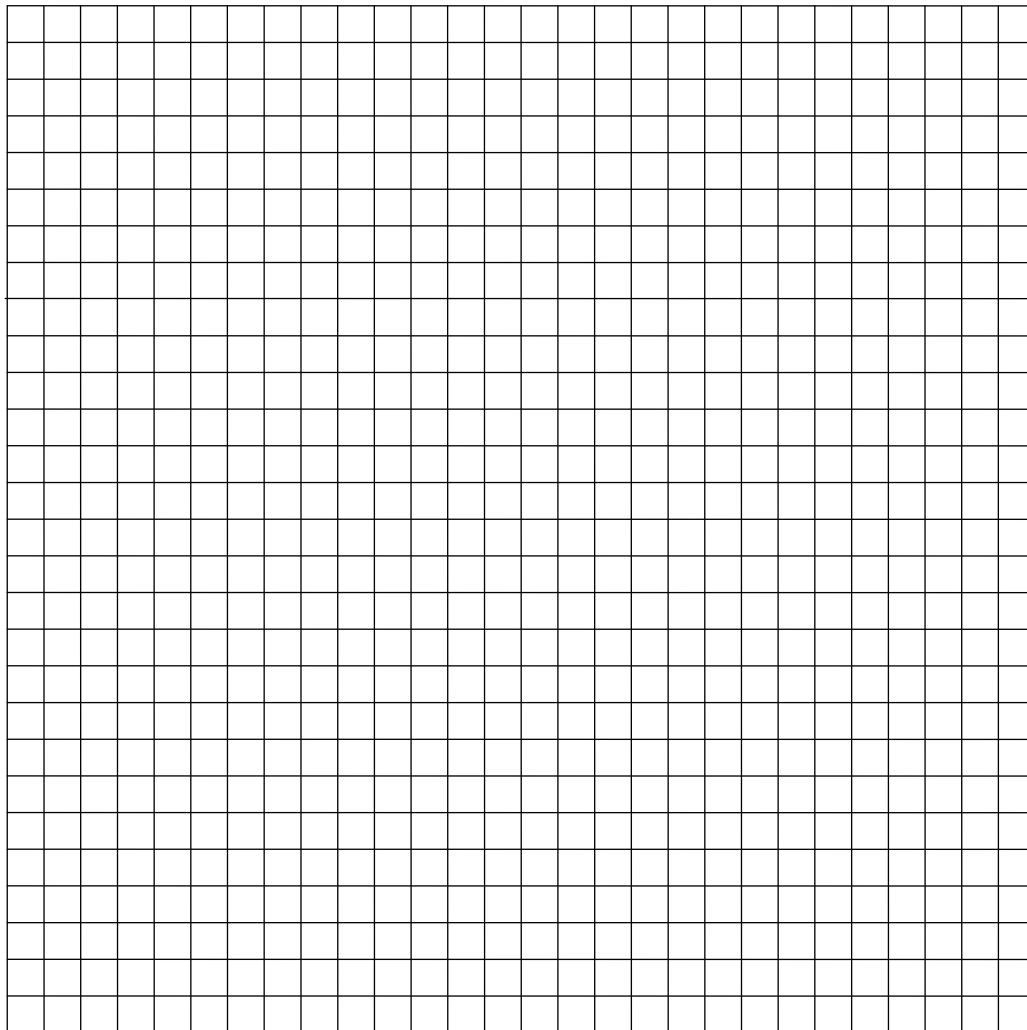
Two: \_\_\_\_\_

Three: \_\_\_\_\_

- (e) Construct a suitable results table for the data. (3 marks)

(f) Sketch a graph of the results that might be obtained.

(4 marks)



(If you wish to have a second attempt at this item, the grid is repeated at the end of the examination booklet. Indicate clearly on this page if you have used the second grid and cancel the working on the grid on this page).

(g) Why is it important for you to conduct the experiment more than once?

(2 marks)

---

---

## Question 22

(27 marks)

Minerals are not always ores.

- (a) Explain clearly the conditions necessary for a mineral to be classified as an ore. (2 marks)

---

---

---

- (b) Is an ore a renewable or non-renewable resource? Explain your answer. (2 marks)

---

---

---

Oxidation-reduction (redox) reactions are extensively employed in industry to extract metals such as aluminium, iron, gold and sodium from their ores.

- (c) Explain the terms 'oxidation' and 'reduction', using **one (1)** example of **each**. (4 marks)

Oxidation: \_\_\_\_\_

---

---

Reduction: \_\_\_\_\_

---

---

- (d) Oxidation and reduction reactions always occur simultaneously. Explain why. (2 marks)

---

---

---

- (e) Explain how the carbon reduction technique for extracting iron from iron ore relies on redox reactions. (4 marks)

---



---



---



---



---



---

- (f) Electrolytic cells use redox processes.

- (i) With reference to the electrolytic extraction of aluminium, draw a diagram of an electrolytic cell, labelling the anode, cathode and electrolyte. (4 marks)

- (ii) In the above cell, what materials are used to make the following components? (3 marks)

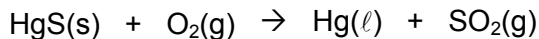
Anode: \_\_\_\_\_

Cathode: \_\_\_\_\_

Electrolyte: \_\_\_\_\_

(g) The reactivity of metals is closely related to the method used to extract them from their ores. Below is a brief outline of the extraction methods used to obtain three metals from their ore.

- Mercury can be found in nature in the elemental state, or it can be extracted directly from cinnabar (HgS) by roasting in air:



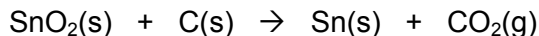
- Magnesium is extracted from magnesite (MgCO<sub>3</sub>) by dissolving the ore in hydrochloric acid to form magnesium chloride:



The solution is then evaporated to dryness to produce magnesium chloride. This is then heated to 700°C so electrolysis of the molten magnesium chloride can be carried out:



- Tin is extracted from the ore cassiterite, SnO<sub>2</sub>, by thermal reduction with carbon:



Using the information above and your knowledge of the extraction of iron and aluminium, rank the metals from most reactive to least reactive. For each metal, give a reason for your decision. (6 marks)

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

Question 23

(19 marks)

Approximately half of all CO<sub>2</sub> produced in Australia comes from electricity generation. Fossil fuels including coal, oil and natural gas, are combusted with air to produce energy and carbon dioxide, which is released into the atmosphere.

- (a) Sometimes we read that carbon dioxide in the atmosphere acts like a blanket to keep the Earth warm. Explain why this comparison is **incorrect**, using the terms *conduction*, *convection* and *radiation*. (6 marks)

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

- (b) Explain why the phrase ‘fossil fuel’ is used to describe coal, oil and natural gas. (2 marks)

---

---

---

---

- (c) Explain why natural gas is considered more ‘greenhouse friendly’ than coal. (2 marks)

---

---

---

---



- (d) Explain what is meant by the ‘enhanced greenhouse effect’ and why the emissions from a fossil fuel power station are thought to contribute to climate change. (5 marks)

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

- (e) ‘Climate change’ is a term that is often used to describe the enhanced greenhouse effect. It is preferred to the term ‘global warming’ as the changes to the climate are much more complex than simply an increase in temperature. Identify and discuss **two (2)** observations that provide evidence that climate change is occurring and **two (2)** that indicate that it is not occurring. (4 marks)

Evidence for climate change:

Observation 1: \_\_\_\_\_

---

Observation 2: \_\_\_\_\_

---

Evidence against climate change:

Observation 1: \_\_\_\_\_

---

Observation 2: \_\_\_\_\_

---

Question 24

(27 marks)

Photovoltaic systems can be used to provide electricity for small- and large-scale applications, ranging from solar powered calculators through to large systems supplying electricity to many homes and businesses.

A 1 kW photovoltaic system costs approximately \$10 000 and provides on average 4.5 kWh per day of electricity in Perth, with a lifetime of at least 20 years.

- (a) Describe, with aid of a diagram, how a photovoltaic cell produces an electrical current.

(5 marks)

---



---



---



---



---



---

- (b) A photovoltaic system with a surface area of  $4.6 \text{ m}^2$ , produces 1050 W when the sunlight has an intensity of  $1000 \text{ W m}^{-2}$  (watts per square metre). Calculate the efficiency of this system.

(2 marks)

- (c) An electronic device converts the electricity generated by the photovoltaic array into 240 V, which is used by electrical appliances. Calculate the current produced by the system at 240 V. (2 marks)

- (d) Identify one advantage and one disadvantage of a photovoltaic system for providing electricity to a home in Perth compared with electricity provided by the electricity network (grid). (2 marks)

Advantage: \_\_\_\_\_

\_\_\_\_\_

Disadvantage: \_\_\_\_\_

\_\_\_\_\_

- (e) Producing a photovoltaic system requires energy use. The system described in (b) took 2611 kWh to manufacture. How long will it take to 'pay back' this amount of electrical energy under the same conditions as described in (b)? (2 marks)

- (f) If a photovoltaic system lasts for 25 years, how much electricity will it generate during its life? (2 marks)

As shown in Table 2, a large number of photovoltaic systems were installed around Australia under an Australian Government program known as the Solar Homes and Communities Program. This program provided a rebate of up to \$8000 for systems of up to 1 kW to homes.

<b>Photovoltaic installations by year</b>	
2000	1572
2001	835
2002	807
2003	697
2004	641
2005	847
2006	947
2007	2549
2008	7169
2009	32 994

**Table 1:** Photovoltaic system installations in Australia, 2000-2009

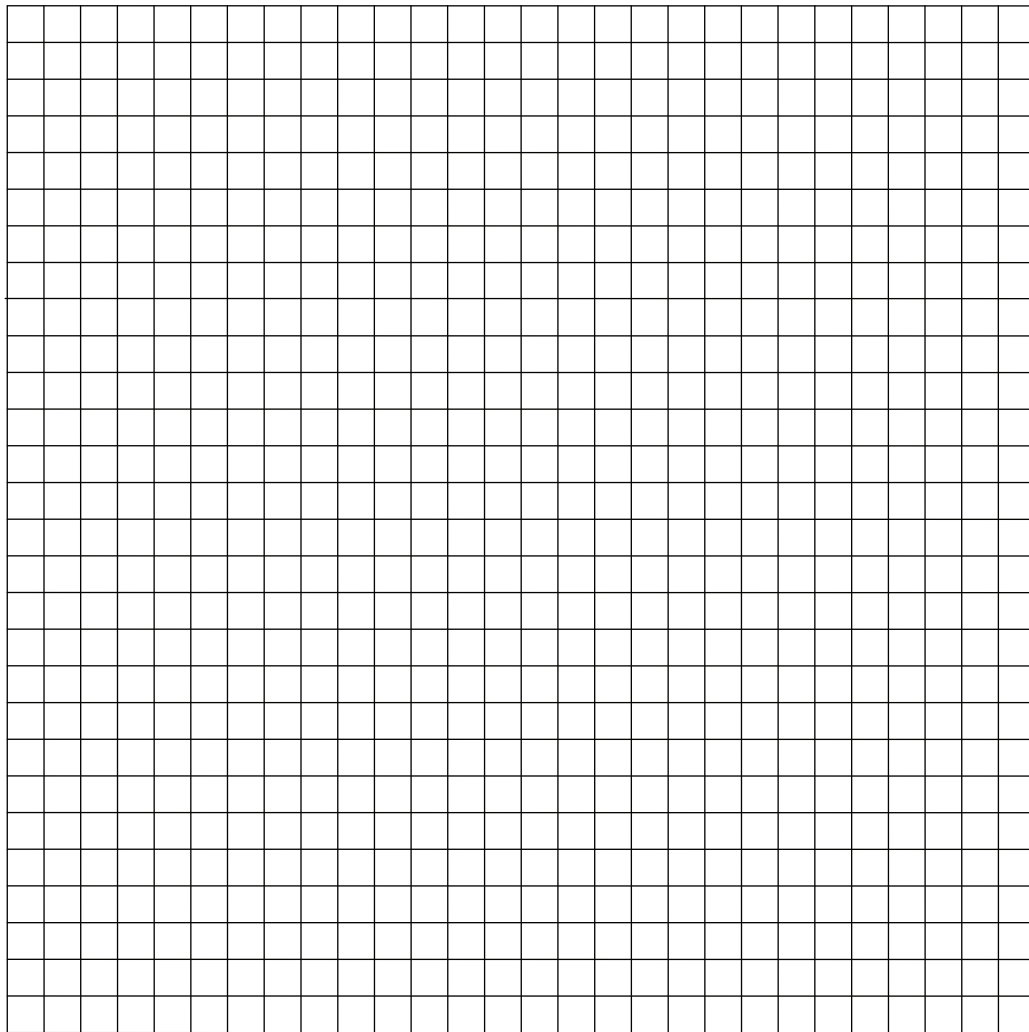
<b>Location</b>	<b>When</b>	<b>Total number installed</b>	<b>Total watts</b>
W.A. total	Oct 2007 to Sept 2008	613	878 366
National total	Oct 2007 to Sept 2008	6731	10 119 963
W.A. total	Oct 2008 to Sept 2009	6104	7 139 554
National total	Oct 2008 to Sept 2009	36 160	44 234 387

**Table 2:** Photovoltaic system installations, Australia and Western Australia, October 2007-September 2009

Although the program officially finished in June 2009, systems that received this rebate were able to be installed for a further 12 months. In July 2009, a new program (the Solar Credits Scheme), which resulted in a discount of approximately \$5000 for a 1 kW system, was introduced.

(g) Plot the number of photovoltaic systems installed for Australia from 2000 to 2009.

(4 marks)



(If you wish to have a second attempt at this item, the grid is repeated at the end of the examination booklet. Indicate clearly on this page if you have used the second grid and cancel the working on the grid on this page).

(h) What does the graph tell you about the success of the program?

(3 marks)

---

---

---

- (i) Describe what happened to Western Australia’s share of the total number of systems installed in the period October 2007–September 2008 compared with the period October 2008–September 2009. (2 marks)

---

---

---

- (j) Describe what happened to the average output of photovoltaic systems installed in Western Australia during the period October 2007–September 2009. (1 mark)

---

---

- (k) Suggest what might happen to the number of photovoltaic systems installed under the Solar Credits Scheme. (2 marks)

---

---

---

---

Question 25

(12 marks)

- (a) Uranium is a resource mined in Australia. It can be used in nuclear power plants to create electricity. Outline **one (1)** similarity and **one (1)** difference between the operation of a nuclear power station and a coal-fired power station. (2 marks)

Similarity: \_\_\_\_\_

\_\_\_\_\_

Difference: \_\_\_\_\_

\_\_\_\_\_

- (b) Describe **five (5)** steps that must be taken to ensure the safe handling and storage of nuclear material in a nuclear power plant, including the disposal of spent fuel rods.(5 marks)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- (c) Nuclear fusion and nuclear fission can both be used to generate energy. Describe each process, using an example of an element to illustrate each process. (5 marks)

Fusion: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Fission: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

End of Section Two

See next page

**Section Three: Extended response****30% (60 Marks)**

This section contains **two (2)** questions. You must answer **both** questions. Write your answers in the space 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(s) that you are continuing to answer at the top of the page.

Suggested working time: 60 minutes.

---

**Question 26****(30 marks)**

A mining company has obtained a lease on an area of land in Western Australia. It plans to conduct exploration for possible ore deposits.

- (a) Describe in detail **two (2)** exploration techniques that the company might use in its search for an ore body. (8 marks)
- (b) Once an ore body is located and is deemed viable, planning for a mine begins. Prior to the commencement of mining, government regulations require an Environmental Impact Statement (EIS) to be completed. In this statement it is important for both environmental and social impacts to be considered.

Explain why it is important for the mining company to gain government approval for its management of the:

- local environment and habitat
  - protection of unique and endangered species. (12 marks)
- (c) Mining activities can also impact on communities close to where the mine and mining activities are located.

An EIS can fulfil a number of needs in addition to describing the natural environment immediately adjacent to the proposed mining activities.

- Describe **five (5)** activities or features that you would expect to see documented as part of an assessment of the cultural heritage.
- Describe **five (5)** activities or features that you would expect to see documented as part of a discussion of the community consultation that has been undertaken or proposed. (10 marks)



## Question 27

(30 marks)

When assessing the sustainability of an energy source, consideration should be given to evaluating the economic, social and environmental consequences associated with its use, as well as the period of time over which it can be harnessed. Fossil fuels provide over 80 per cent of the world's total primary energy supply. Nuclear energy, derived from uranium, accounts for another 6 per cent.

The following information relates to the known reserves of each of the energy sources as at the end of 2008 and the amounts consumed for the same year.

Energy Source	Reserves	Consumption	Units
Oil	1258.1	30	billion barrels
Coal	826 001	6118	million tonnes
Natural gas	185 020	3019	billion cubic metres
Uranium	5 469 000	41 282	tonnes

- (a) Natural gas and oil can be used to produce electricity and fuels for transport. Evaluate natural gas and oil, using the following headings:
- (i) The potential longevity of the energy source (how long it might last before collecting is no longer viable); and
  - (ii) The social, economic and environmental impacts of using the energy source. (10 marks)
- (b) Renewable energy sources are often proposed as alternative ways to produce electricity. Evaluate the sustainability of **two (2)** renewable energy sources, using the following headings;
- (i) The potential longevity of the resource (how long it might last before collecting is no longer viable); and
  - (ii) The social, economic and environmental impacts of using the energy source. (10 marks)
- (c) Western Australia has large reserves of natural gas and abundant renewable energy resources. With reference to your answers to parts (a) and (b), discuss which would be the most suitable source to provide electricity for Perth in 2030. (10 marks)

**End of questions**











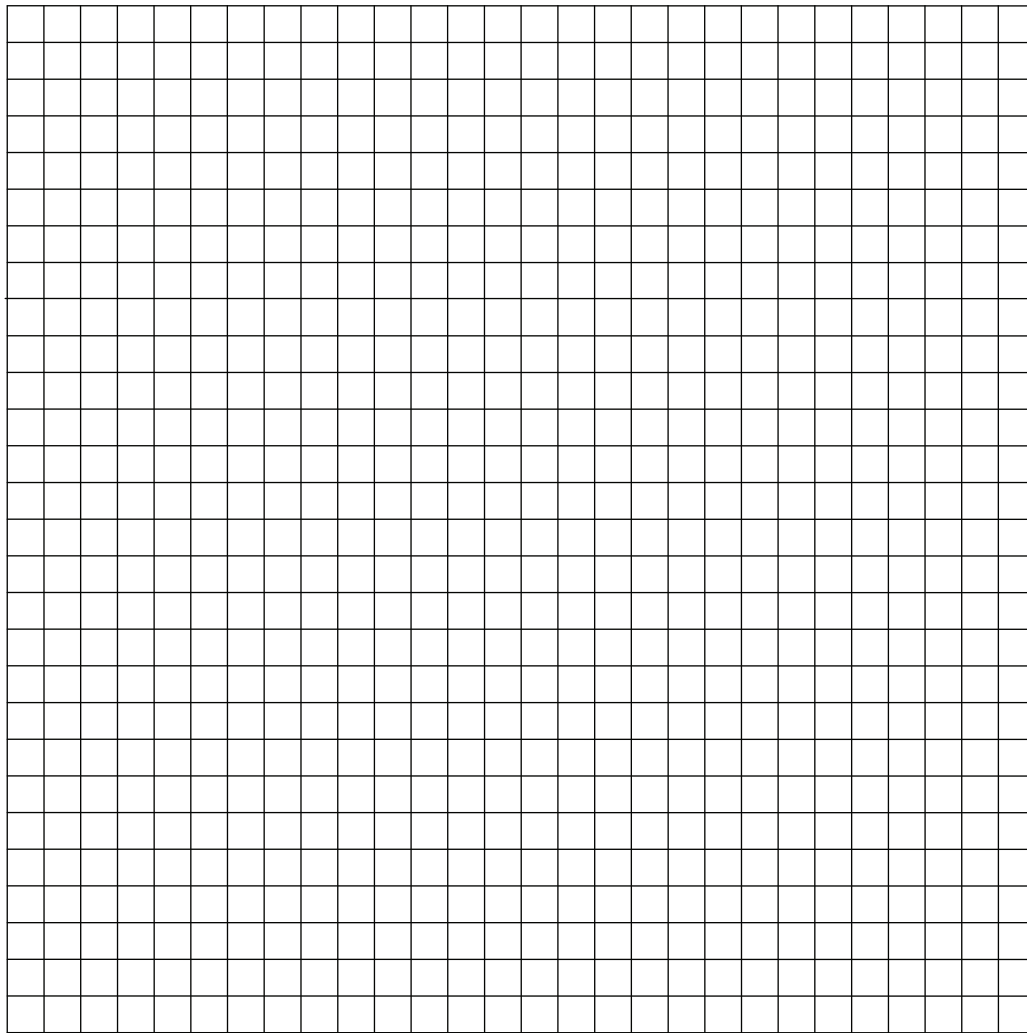












## ACKNOWLEDGEMENTS

### Section One

**Question 13** Source from: CSIRO. (15 May 2009). *Termites and trees go for gold*  
Retrieved April, 2010, from  
[www.csiro.au/multimedia/Natural-indicators-for-mining.html](http://www.csiro.au/multimedia/Natural-indicators-for-mining.html).

**Question 18** Data source: Department of Environment, Water, Heritage and the Arts. (16 September 2009). *Montreal Protocol on substances that deplete the ozone layer - graphs*. Retrieved April, 2010, from:  
[www.environment.gov.au/atmosphere/ozone/legislation/montp-graphs.html](http://www.environment.gov.au/atmosphere/ozone/legislation/montp-graphs.html).

### Section Two

**Question 24** Data source: Department of Climate Change and Energy Efficiency. (2010). *Solar Homes and Communities Plan*. Retrieved October 30, 2009 from:  
[www.environment.gov.au/settlements/renewable/pv/pubs/wattsbymonth-sep09.xls](http://www.environment.gov.au/settlements/renewable/pv/pubs/wattsbymonth-sep09.xls).

### Section Three

**Question 27** Data source: BP. (2009). *BP statistical review of world energy: June 2009*. Retrieved March, 2010, from  
[www.bp.com/liveassets/bp\\_internet/globalbp/globalbp\\_uk\\_english/reports\\_and\\_publications/statistical\\_energy\\_review\\_2008/STAGING/local\\_assets/2009\\_downloads/statistical\\_review\\_of\\_world\\_energy\\_full\\_report\\_2009.pdf](http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2009_downloads/statistical_review_of_world_energy_full_report_2009.pdf).

Data source: World Nuclear Association. (2010). *Uranium production figures, 1999-2009*. Retrieved March, 2010, from: [www.world-nuclear.org/info/uprod.html](http://www.world-nuclear.org/info/uprod.html).

This examination paper – 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 Curriculum Council is acknowledged as the copyright owner. Teachers in schools offering the Western Australian Certificate of Education (WACE) may change the examination paper, provided that the Curriculum Council's moral rights are not infringed.

Copying or communication for any other purpose can be done only within the terms of the Copyright Act or with prior written permission of the Curriculum Council. Copying or communication of any third party copyright material can be done only within the terms of the Copyright Act or with permission of the copyright owners.