Name: …….....

YEAR 11

EARTH AND ENVIRONMENTAL SCIENCE

Select the alternative A, B, C or D that best answers the question.

Fill in the response space completely. If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

If you change your mind and have crossed out what you consider to be the correct answer, then indicate this by writing the word ***correct*** and drawing an arrow.

Start Here

1.	A ⬭	B ⬭	C ⬭	D ⬭
2.	A ⬭	B ⬭	C ⬭	D ⬭
3.	A ⬭	B ⬭	C ⬭	D ⬭
4.	A ⬭	B ⬭	C ⬭	D ⬭
5.	A ⬭	B ⬭	C ⬭	D ⬭
6.	A ⬭	B ⬭	C ⬭	D ⬭
7.	A ⬭	B ⬭	C ⬭	D ⬭
8.	A ⬭	B ⬭	C ⬭	D ⬭
9.	A ⬭	B ⬭	C ⬭	D ⬭
10.	A ⬭	B ⬭	C ⬭	D ⬭
11.	A ⬭	B ⬭	C ⬭	D ⬭
12.	A ⬭	B ⬭	C ⬭	D ⬭
13.	A ⬭	B ⬭	C ⬭	D ⬭
14.	A ⬭	B ⬭	C ⬭	D ⬭
15.	A ⬭	B ⬭	C ⬭	D ⬭

No. of Copies: 35

Name: …….
Miss K Gillies
Mr P Hare

SEMESTER II

2005

Preliminary Course

EARTH AND ENVIRONMENTAL SCIENCE

2 UNIT

TIME ALLOWED: 2 HOURS

DIRECTIONS TO CANDIDATES:

* Answer **ALL** questions. Total marks 75.

* A ***Geological Time Scale*** is included on **Page 23**.

* This paper is in **TWO PARTS**

* **SECTION A - 15** one-mark multiple choice questions. Indicate all answers on the Answer Sheet provided. **Remove the multiple choice answer page to complete your answers.**

*** SECTION B** – Total 60 Marks
Short Answer and Longer Response questions.
All answers are to be written in the spaces provided.

Good luck

Section A

Questions 1 to 15 (1 mark each)
Multiple choice questions, choose the best answer.
Indicate all answers on the Answer Sheet provided.

1. Initially the Earth had no free oxygen in the atmosphere. The build up of oxygen was as a result of the activity of early organisms.

   What were the first organisms to produce oxygen?

   (A) algae which carried out chemosynthesis.

   (B) bacteria which carried out photosynthesis.

   (C) archaeobacteria which carried out anaerobic respiration.

   (D) bacteria similar to those found near deep ocean volcanic vents.

2. Banded Iron Formations (BIFs) are composed of alternating layers of iron rich material and silica which accumulated in the sea.

   Banded iron formations only exist in rocks dating from 1.8 to 2.5 million years ago.

   Why are there no BIFs recorded in rocks younger than 1.8 million years?

   (A) high carbon dioxide levels prevents the iron from forming in the sea.

   (B) iron combines with oxygen on land rather than in the sea.

   (C) blue green algae have ceased precipitating iron.

   (D) all the iron on Earth was used up by then.

3. What evidence do scientists use to state that the Earth is layered?

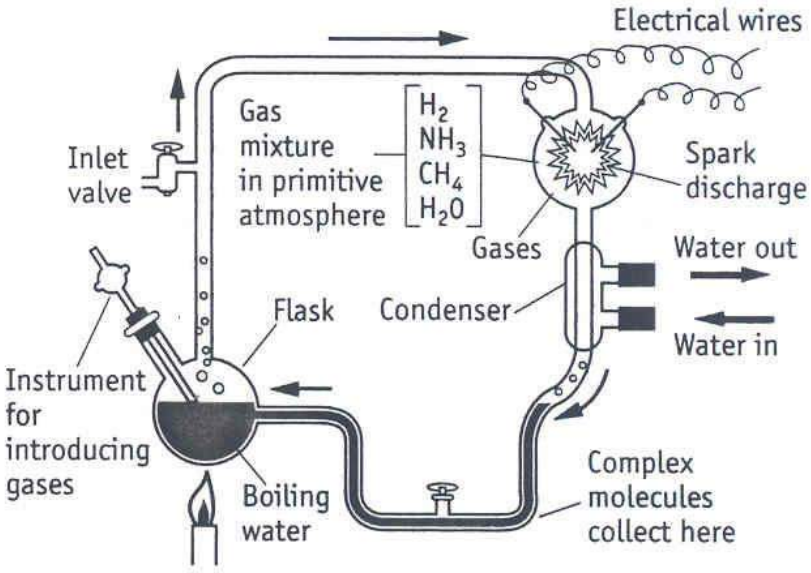
(A) gravity measurements.

(B) density of rocks.

(C) P and S waves.

(D) meteorites.

4. The diagram below shows the apparatus developed by Stanley Miller and Harold Urey.



What was the importance of their experiment?

(A) It proved the Big Bang occurred.

(B) It showed that all of the gases could be produced by volcanoes.

(C) It helped understanding of how life may have originated on Earth.

(D) It proved that complex molecules could be broken down into simple ones.

5. Soils are typically made up of horizontal layers called horizons.

Which of the following would you expect to find less of in the A horizon of a soil?

(A) clay.

(B) humus.

(C) microorganisms.

(D) soluble minerals.

6. A student examined a sample of rock in class and wrote the following description in her note book.

> The rock contained interlocking crystals which were too small to see without a hand lens. The teacher said the rock had no ~~quarts~~ quartz. There was no evidence of any layers or mineral alteration. It was decided that the rock had formed from a volcano on the surface of the Earth.

Based on her information, how is the rock best classified?

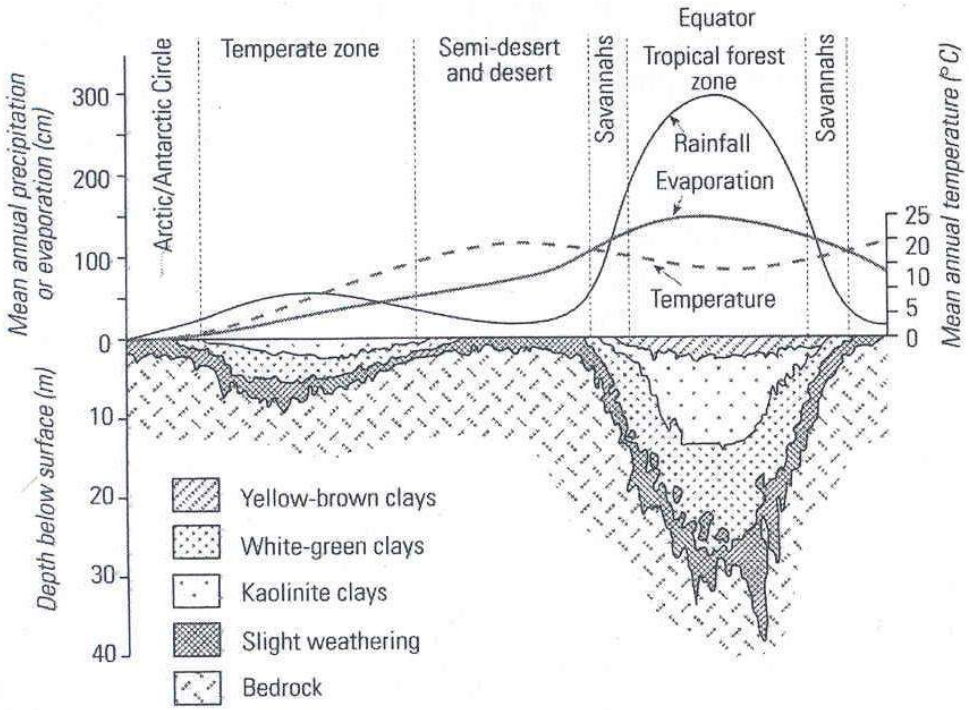
(A) igneous and volcanic.

(B) igneous and plutonic.

(C) sedimentary.

(D) metamorphic.

7. The diagram below shows how latitude, climate and soil formation are related.



What zone would have the thinnest soils?

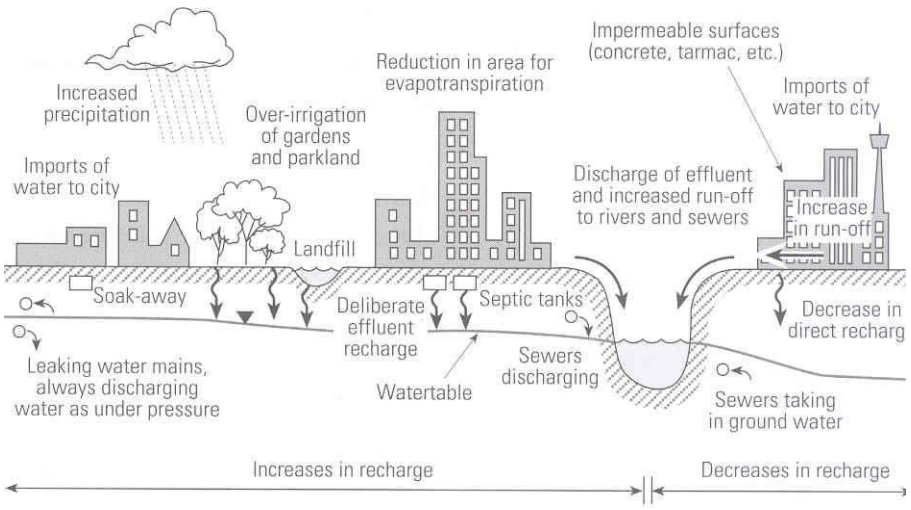
(A) Tropical forests.

(B) Temperate Zones.

(C) Savannahs.

(D) Deserts.

8. The diagram below shows the water table in a built environment.



Which factor listed below could cause the water table to fall?

(A) increased precipitation.

(B) over irrigation of gardens.

(C) removing trees.

(D) increased runoff.

9. What happens to the capacity of water to hold carbon dioxide as the temperature of water increases?

(A) remains constant.

(B) increases.

(C) decreases.

(D) fluctuates.

10. Which common pollutant could possibly increase in a river system as a result of household detergents?

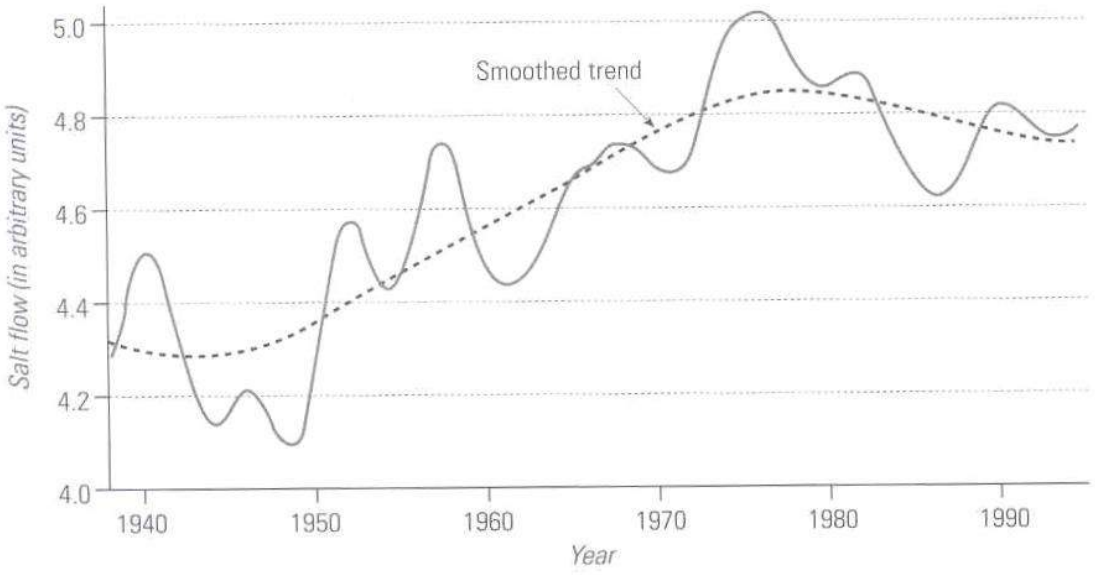
(A) chlorides.

(B) potassium.

(C) phosphates.

(D) carbon dioxide.

11. The graph below shows salinity at a recording station on the Murray River.



What is a possible reason for the high salinity in 1975?

(A) increased water flow due to high rainfall.

(B) less evaporation due to cooler temperatures.

(C) decreased water flow due to drought.

(D) restoration of the riparian vegetation along the river bank.

12. When Rubidium-87 decays radioactively it forms a different element Strontium-87.

What is the name given to this different element?

(A) unstable isotope.

(B) parent isotope.

(C) daughter isotope.

(D) radiometric isotope.

13. Samples of Zircon crystals from Mt Narryer in Western Australia have been dated and their age determined to be between 4 000 and 4 200 million years old.

In which **EON** did the Mt Narryer zircons form?

(A) Phanerozoic.

(B) Proterozoic.

(C) Archean.

(D) Hadean.

14. What is the lithosphere?

(A) a rigid layer comprising the crust and upper mantle.

(B) a partially solid zone in the mantle.

(C) a mobile zone which allows plates to move.

(D) the molten layer between the core and the mantle.

15. What is Alfred Wegener best remembered for?

(A) developing absolute dating techniques.

(B) mapping magnetic reversals on the sea floor.

(C) proving that new sea floor is produced at ridges.

(D) suggesting that continents have moved over time.

Name: .....

Section B

Questions 16 to 30 (Total 60 Marks)

Write your answers in the appropriate space on this paper.

16. Outline how early Earth organisms could have obtained their energy prior to the advent of oxygen in the atmosphere. ***3 marks***

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17. Explain the role of gravity in the formation of the Earth. ***3 marks***

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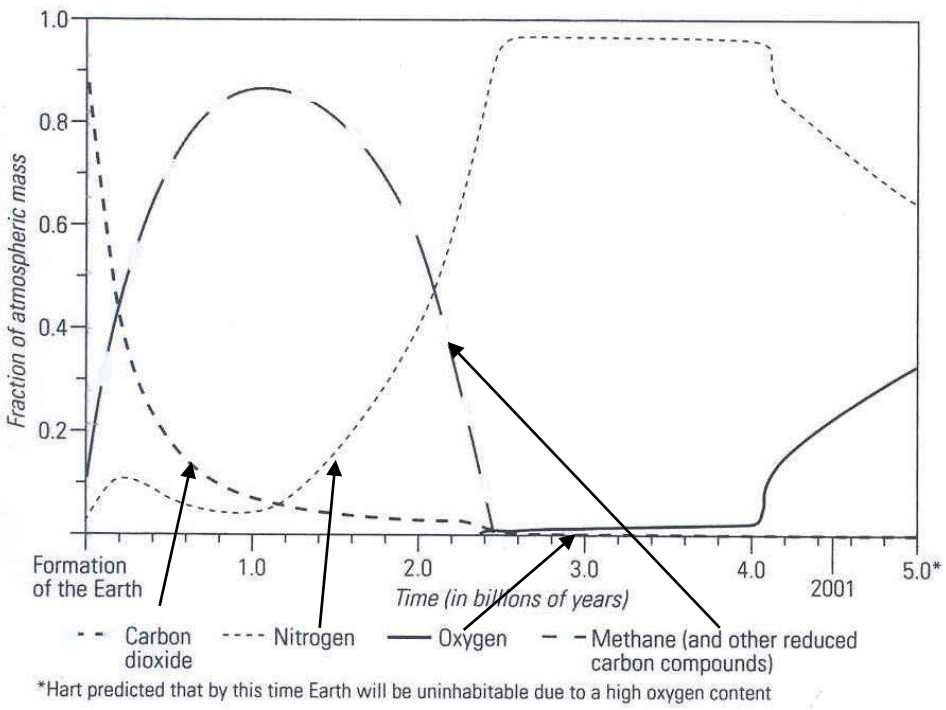
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18. The diagram below shows Hart's estimates of atmospheric gases throughout Earth history.



a) For ONE gas shown in the diagram, describe how its relative amount in the atmosphere changed since the origin of the Earth. ***2 Marks***

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b) For the gas you have named explain why its relative amount in the atmosphere has changed. ***2 Marks***

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c) Name another gas present in the Earth's early atmosphere not shown in the above graph. ***1 mark***

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19. You have performed a first hand investigation to measure the density of a selection of Earth materials which represented various layers inside the Earth. ***4 marks***

Using the scientific method show what you did in this experiment.

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20. Major changes have occurred over the last 50 years to the local environment you have studied in your EES course. ***6 marks***

Explain how these changes have affected –

- vegetation cover and diversity
- animal diversity and abundance
- water flow and quality

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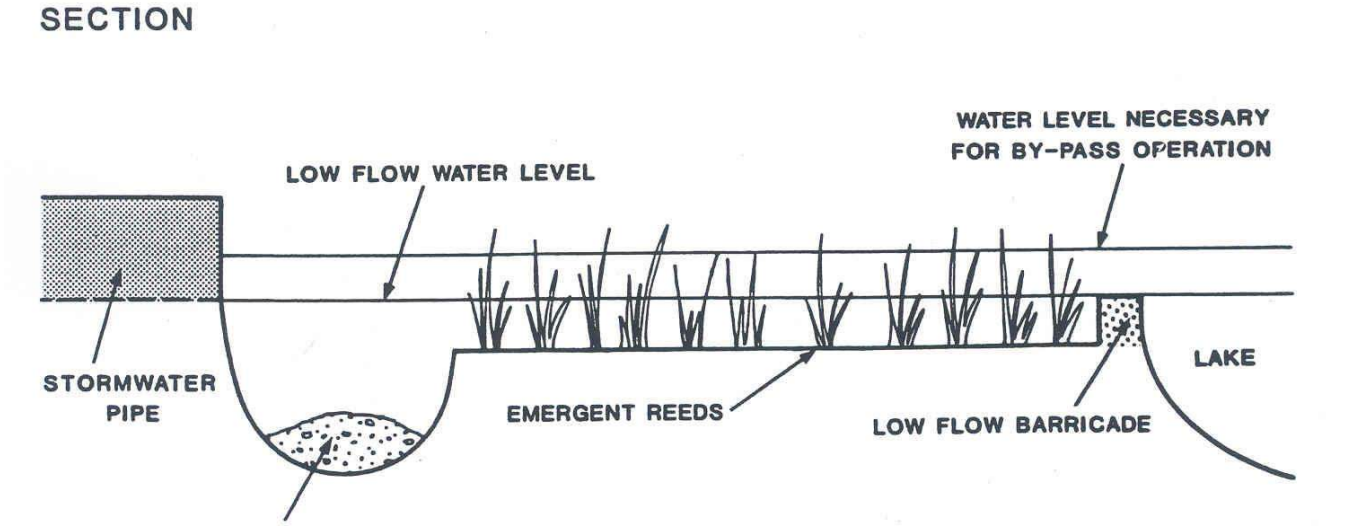
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21. The diagram below shows an artificial structure used to reduce the impact of urban development on natural ecosystems.



a) Identify the structure ***1 mark***

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b) Describe how the structure reduces the impact of the built environment on the natural environment. ***2 marks***

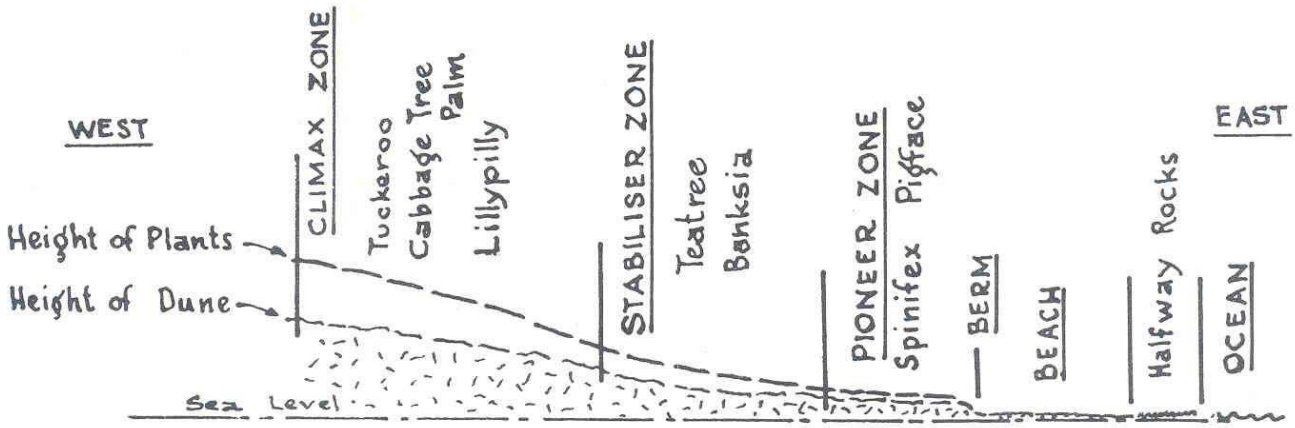
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22. The diagram shows the vegetation across a sand dune.



Explain why the vegetation changes from East to West. ***2 marks***

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23. Explain what is meant by the term 'biodiversity'. ***2 marks***

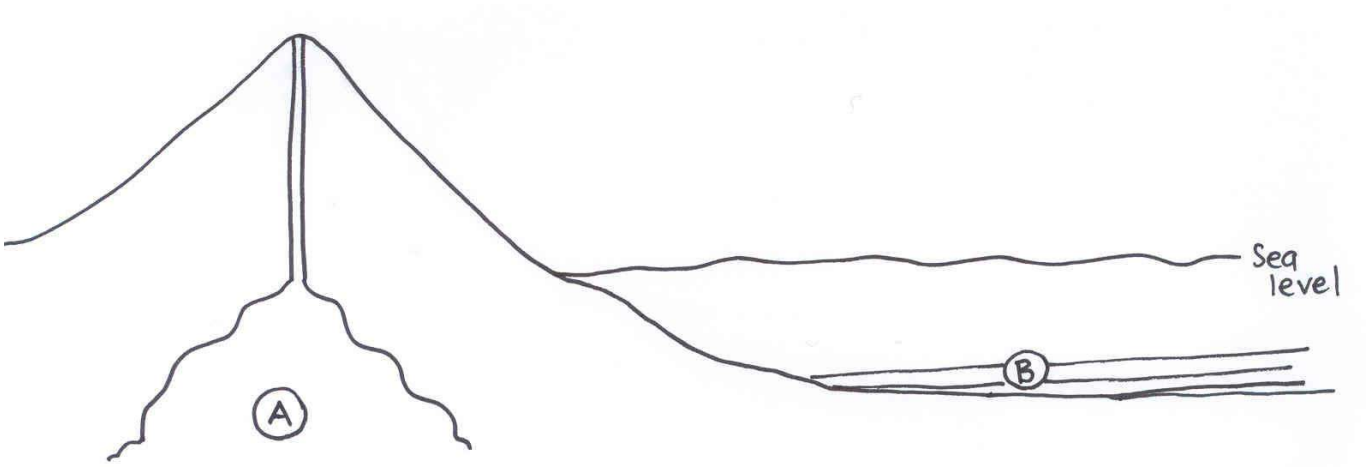
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24. Refer to the diagram below which was drawn by a teacher for her class.



a) Name a possible rock type at A. ***1 mark***

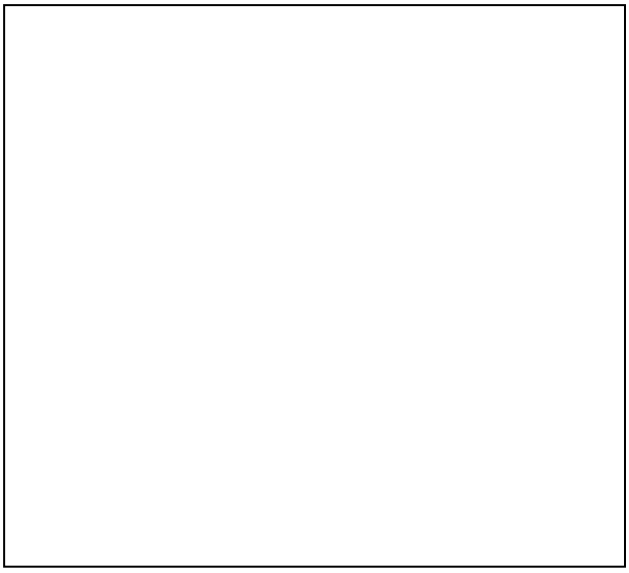
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b) Name a possible rock type at B ***1 mark***

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25. Water has been called the ‘universal solvent’.

a) Draw a water molecule and label the atoms present ***2 marks***



b) Explain why water is such an effective solvent. ***2 marks***

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26. Describe the possible causes and effects of eutrophication on a previously healthy waterway. ***2 marks***

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27. In your Earth and Environmental Science course you have carried out a first hand investigation to determine the effect of salinity on plant growth.

a) Describe the method you used to set up the experiment. ***2 marks***

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b) Summarise your results. ***2 marks***

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c) Assess the validity of the results you obtained. ***2 marks***

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28. In your Earth and Environmental Science course you have used secondary sources including library resources, internet and media to provide information on various topics, including the effect on an ecosystem due to a change in water availability.

Using information gathered from secondary sources -

Describe the effect on the ecosystem of **reducing** the river flow of a river such as the Snowy River. ***3 marks***

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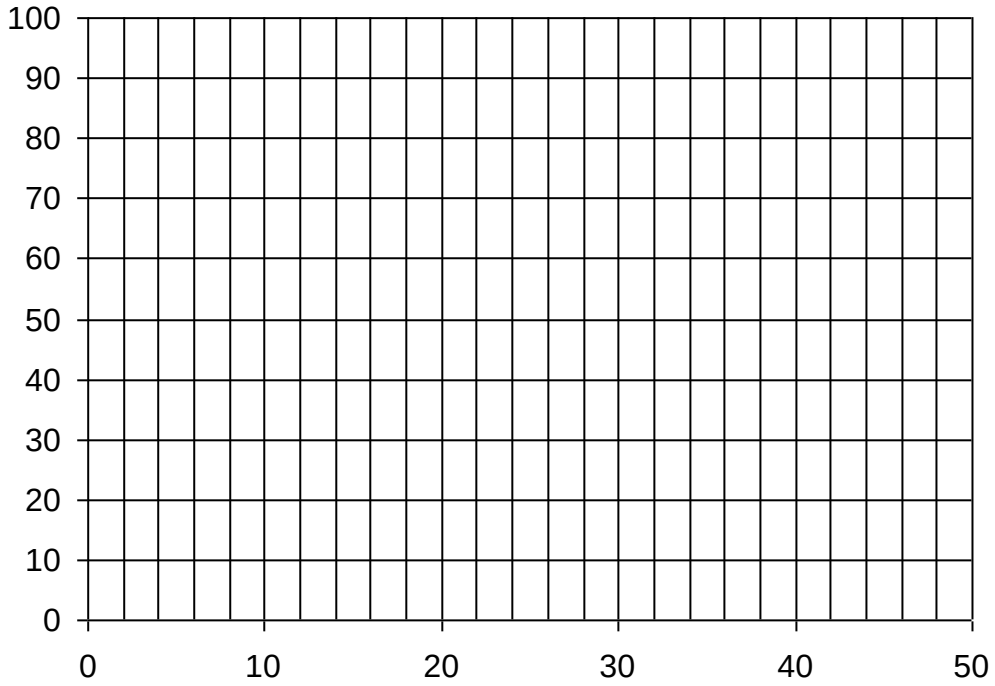
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29. The decay of a radioactive isotope (**X**) used to estimate the age of a rock collected from a lava flow is given in the table below.

Decay of Isotope X

Percentage Remaining	Time (million years)
100	0
80	3
50	10
30	18
16	27
6	40

a) Plot the decay curve for isotope X on the axes below. ***4 marks***



b) Calculate the half life of isotope X ***1 mark***

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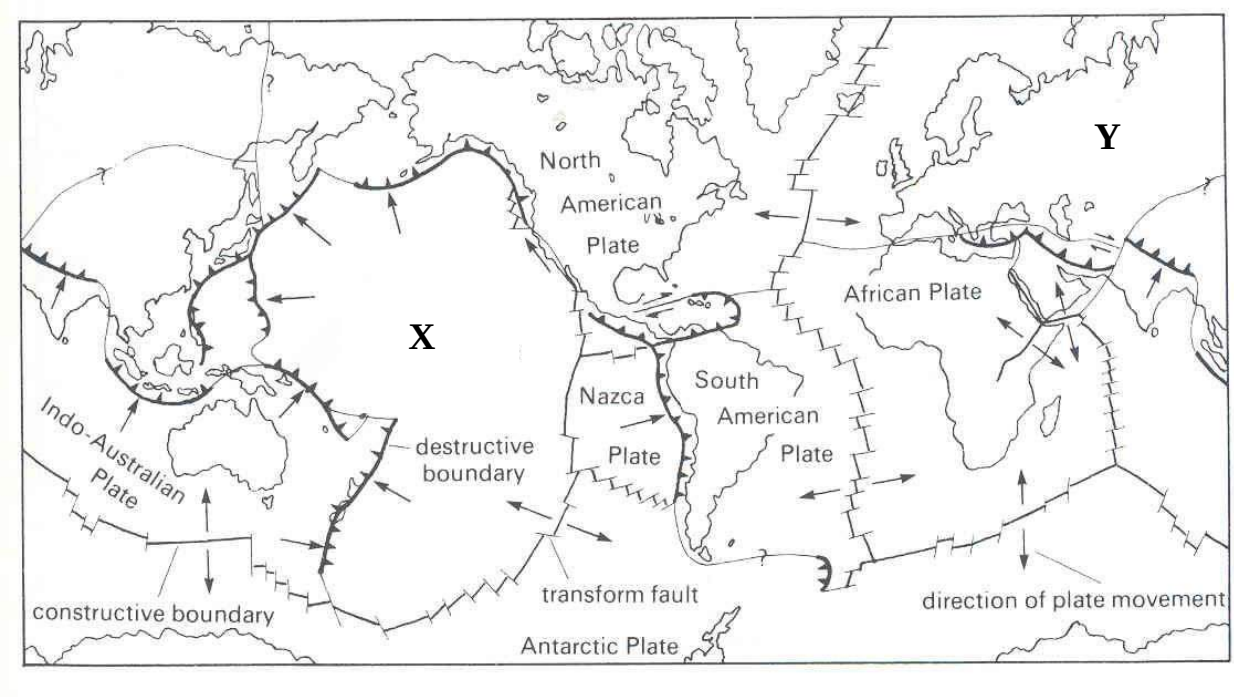
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c) The isotope formed from the decay of X is isotope Y. Use the graph to estimate the age of a lava sample which contains 40% of isotope Y. ***1 marks***

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30. Refer to the map below which shows crustal plates.



(A) Name the plates labelled X and Y. ***2 marks***

Plate X .....

Plate Y .....

(B) Describe the evidence used by scientists to locate the position of, and tectonic movement at each boundary. ***3 marks***

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31. Compare and contrast continental and ocean crust. 4 ***Marks***

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End of Exam!

Geological Time Scale

