BOARD OF STUDIES
NEW SOUTH WALES

HIGHER SCHOOL CERTIFICATE EXAMINATION

1995

GEOLOGY

2 UNIT

Time allowed—Three hours
(Plus 5 minutes' reading time)

DIRECTIONS TO CANDIDATES

Section I—Core

- Attempt ALL questions.
- **Part A** 15 multiple-choice questions, each worth 1 mark.
  Mark your answers in pencil on the Answer Sheet provided.
- **Part B** 10 questions, each worth 3 marks.
  Answer this Part in the Part B Answer Book.
- **Part C** 6 questions, each worth 5 marks.
  Answer this Part in the Part C Answer Book.
- Write your Student Number and Centre Number on each Answer Book.
- You may keep this Question Book. Anything written in the Question Book will NOT be marked.

Section II—Electives

- Attempt ONE question.
- Each question is worth 25 marks.
- Answer the question in a *separate* Elective Answer Book.
- Write your Student Number and Centre Number on the cover of the Elective Answer Book.
- Write the Course, Elective Name, and Question Number on the cover of the Elective Answer Book.
- You may ask for extra Elective Answer Books if you need them.

SECTION I—CORE

(75 Marks)

Attempt ALL questions.

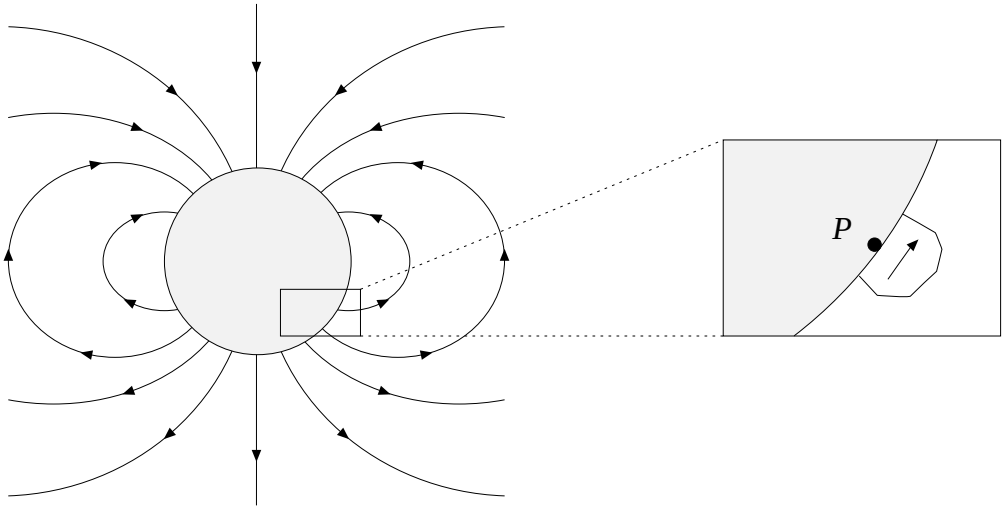
PART A

Questions 1–15 are worth 1 mark each.

Mark your answers in pencil on the Answer Sheet provided.

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

1. The diagram below shows the magnetic field of the Earth. The direction of remanent magnetization of a rock at location *P* is also shown.



Given that no deformation has occurred, the direction of remanent magnetization suggests that the

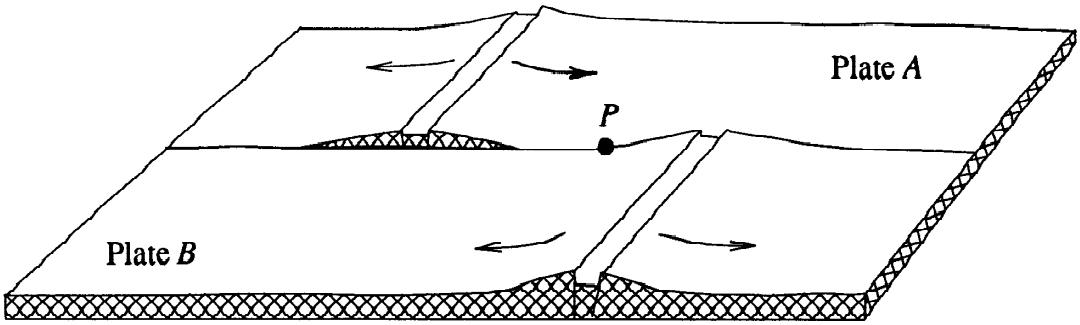
(A) rock formed at its present latitude.

(B) Earth's magnetic field has reversed.

(C) rock formed at a different latitude.

(D) rock was reversely magnetized.

2. The diagram below shows a mid-ocean ridge between lithospheric plates *A* and *B*. The spreading-rate is the same for both sections of the ridge. The arrows indicate relative plate movement.



From the geometry of the plate movement illustrated on the diagram, it would be expected that

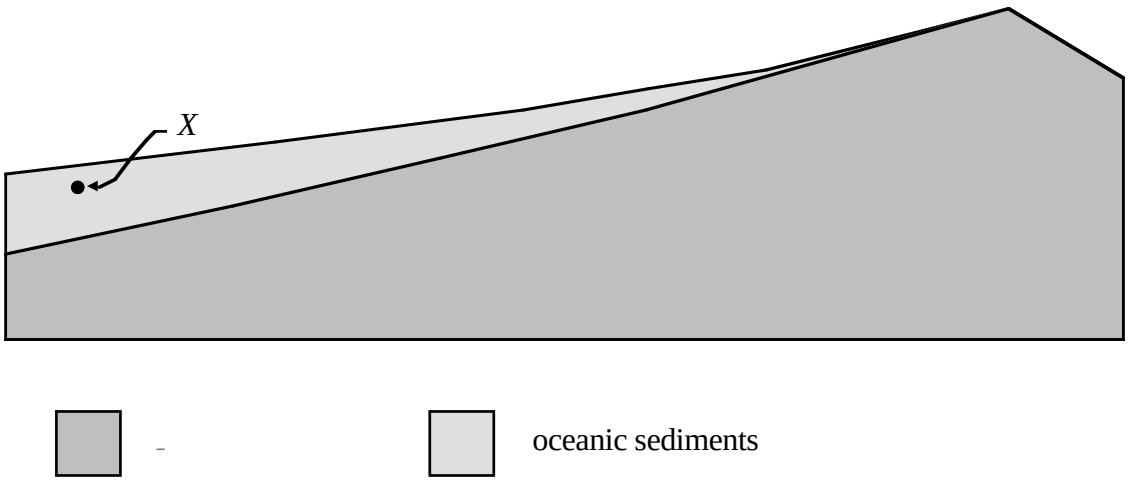
(A) the sea floor is the same age for both plates at location *P*.

(B) the plates slide past one another at location *P*.

(C) there is no relative movement between the plates.

(D) the two sections of ridge are moving closer together.

3. The diagram below shows oceanic sediment on the side of a mid-ocean ridge.



The relative age of a sample of oceanic sediments taken from point *X* would most commonly be determined by using

(A) radiometric dating of the grains.

(B) the distance of the sample from the ridge axis.

(C) radiometric dating of the igneous rock directly below point *X*.

(D) microscopic fossils such as foraminifera.

4. Mid-ocean-ridge volcanism is characterized by

(A) explosive basaltic ash falls.

(B) felsic lava and large quantities of volatiles.

(C) fissure eruptions and pillow lavas.

(D) andesites and a chain of volcanic islands.

5. High fold mountains, such as the Andes Mountains, give rise to large negative gravity anomalies. This occurs because these mountains are

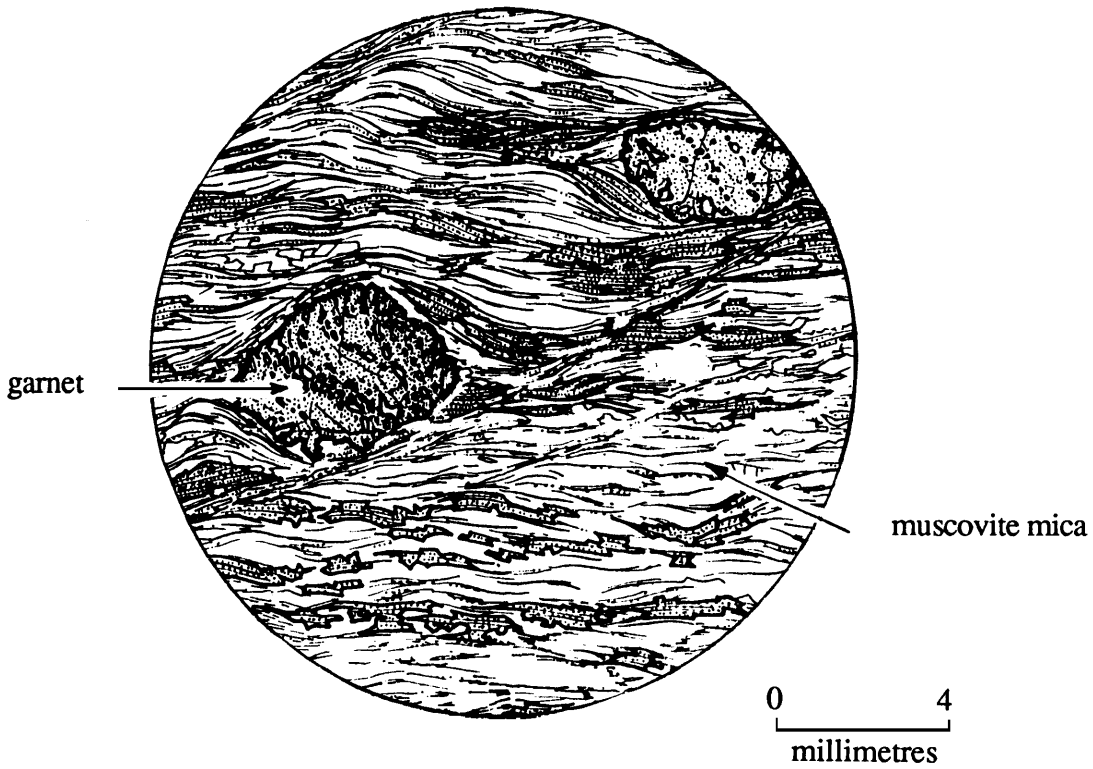
(A) underlain by a root of low-density crustal material.

(B) capped by thick ice and snow.

(C) dissected by numerous reverse faults.

(D) underlain by a concentration of high-density mantle.

6. The diagram below is a drawing from a photomicrograph.



This type of rock is most likely to form in

(A) continental collision zones.

(B) felsic intrusions.

(C) basaltic volcanoes.

(D) transform-fault scarps.

7. Mt Cook, elevation 3764 metres, is the highest peak in the Southern Alps of New Zealand. The average rate of uplift of the Alps, by vertical fault movements, has been determined as 5·7 cm/year. The average rate of erosion of the Alps has been estimated to be 2·5 cm/year. Therefore, the time taken for the Alps to be uplifted from sea-level to their present height is

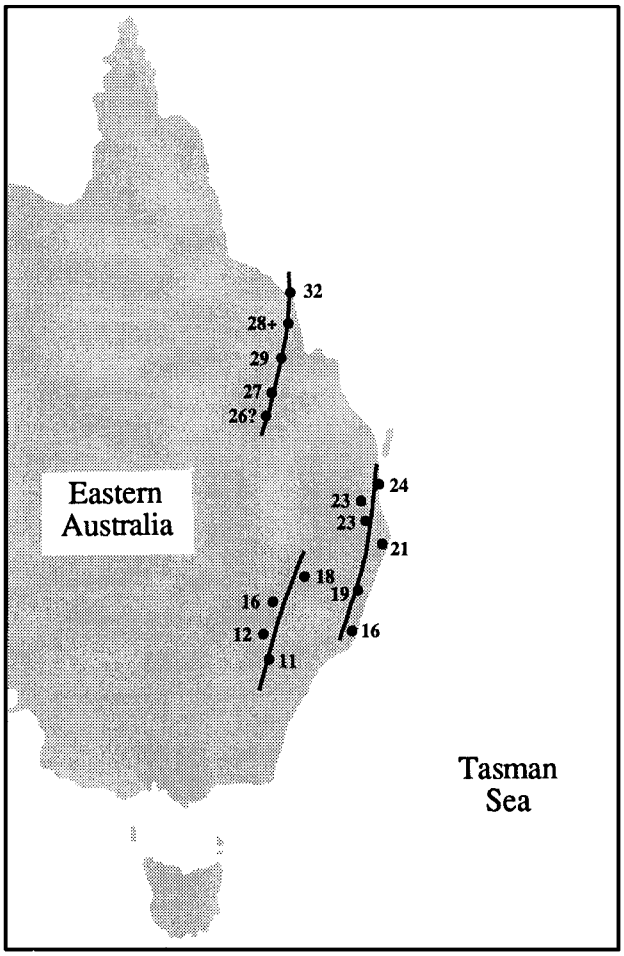
(A) 11 762 years.

(B) 66 035 years.

(C) 117 625 years.

(D) 150 560 years.

8. The map below shows the distribution and ages, in millions of years, of volcanoes in eastern Australia.



This Australian volcanic activity is related to

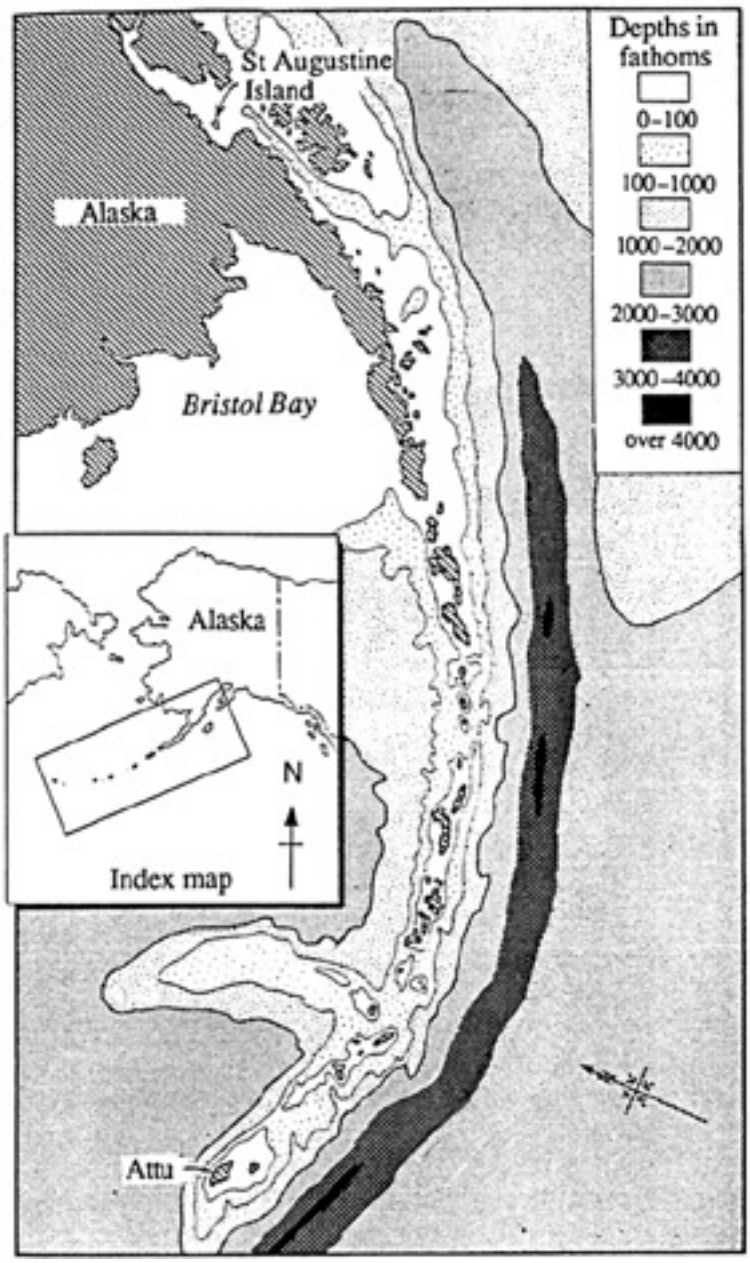
(A) convergence between the Pacific and Indian plates.

(B) an ancient spreading-zone in the Tasman Sea.

(C) a failed triple junction associated with spreading in the Southern Ocean.

(D) movement of Australia over stationary hot spots.

9. The map below shows the ocean floor and islands in the Alaskan region. Depth is shown in fathoms. (1 fathom = 1·8 metres)



The most prominent feature depicted on the map is

(A) a chain of seamounts.

(B) a trench.

(C) an abyssal plain.

(D) a mid-ocean ridge.

10. The correct order of increasing rank of coal types is

(A) peat, lignite, bituminous coal, anthracite.

(B) lignite, peat, bituminous coal, anthracite.

(C) bituminous coal, peat, lignite, anthracite.

(D) anthracite, bituminous coal, lignite, peat.

11. This question refers to the following table, which lists some properties of some important ore minerals.

MINERAL	PROPERTIES			
	Hardness	*Specific gravity*	*Crystal system*	*Fracture or cleavage*
cassiterite	6–7	6·8–7·1	tetragonal	uneven
ilmenite	5–6	4·5–5	hexagonal	conchoidal
zircon	7·5	4·7	tetragonal	conchoidal
gold	2·5–3	12–20	isometric	hackly

Gold and cassiterite are found concentrated in stream deposits. Ilmenite and zircon are found concentrated in beach deposits.

The property most likely to contribute to the concentration of these minerals by sedimentary processes is

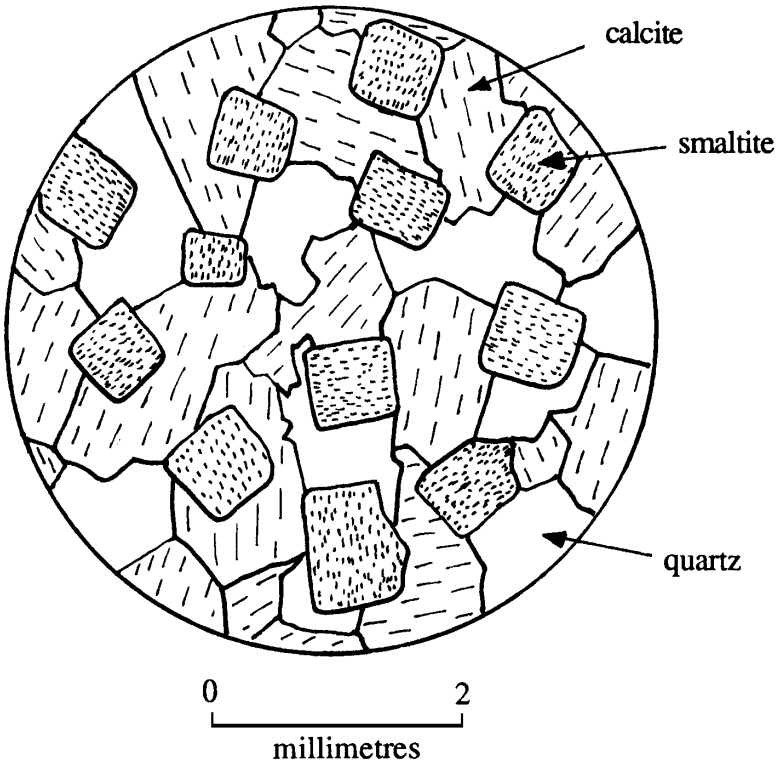
(A) hardness.

(B) specific gravity.

(C) crystal system.

(D) fracture or cleavage.

12. The drawing below is from a photomicrograph of an ore sample containing the ore mineral smaltite. Smaltite is an ore mineral of the metal cobalt.



The percentage of smaltite in this sample is closest to

(A) 5%
(B) 20%
(C) 35%
(D) 50%

13. Crude oil is thought to form from marine plankton, which change in composition when buried in sediment. The table below shows the composition of dry marine plankton and of crude oil.

	ELEMENTS (mass in g/kg of sample)				
	carbon	*hydrogen*	*oxygen*	*sulfur*	*nitrogen*
marine plankton	499	69	378	3	51
crude oil	860	110	25	3	2

The element that shows the greatest percentage decrease is

(A) carbon.
(B) hydrogen.
(C) oxygen.
(D) nitrogen.

14. In 1981, the Bougainville copper mine in Papua New Guinea was estimated to contain 900 000 000 tonnes of copper ore, assaying at 0·48% copper. In 1981, 37 000 000 tonnes of copper ore were mined.

At the 1981 rate of mining, after 15 years the reserves remaining in the mine would be closest to

(A) 440 million tonnes of copper ore.

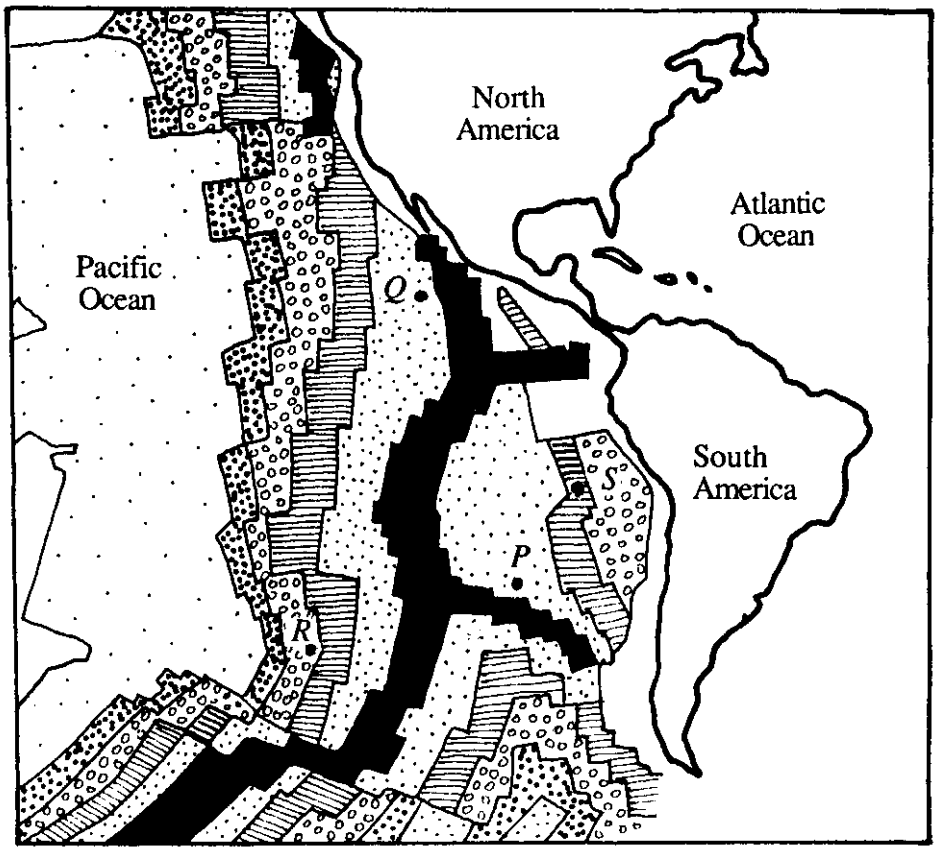
(B) 550 million tonnes of copper ore.

(C) 2·7 million tonnes of copper.

(D) 1·7 million tonnes of copper.

15. The map below shows the distribution of oceanic crust according to age. The map was compiled from available information about the magnetic-anomaly pattern on the ocean floor.

Each of the shaded regions represents oceanic crust having a specific age-range.



The oldest oceanic crust would occur at location

(A) *P*

(B) *Q*

(C) *R*

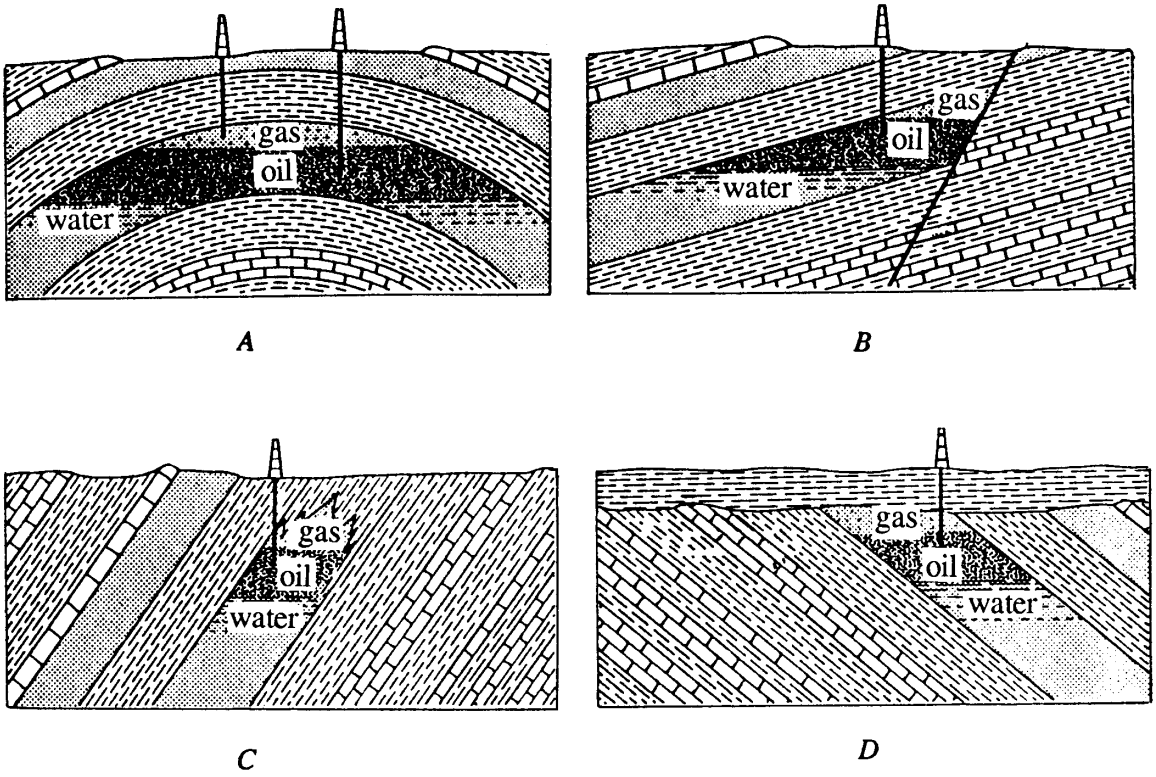
(D) *S*

PART B

Questions 16–25 are worth 3 marks each.

Answer this Part in the Part B Answer Book.

16. The diagrams below show four contrasting oil traps: *A, B, C,* and *D.*



(a) Oil traps are generally classified by geologists as structural or stratigraphic oil traps.

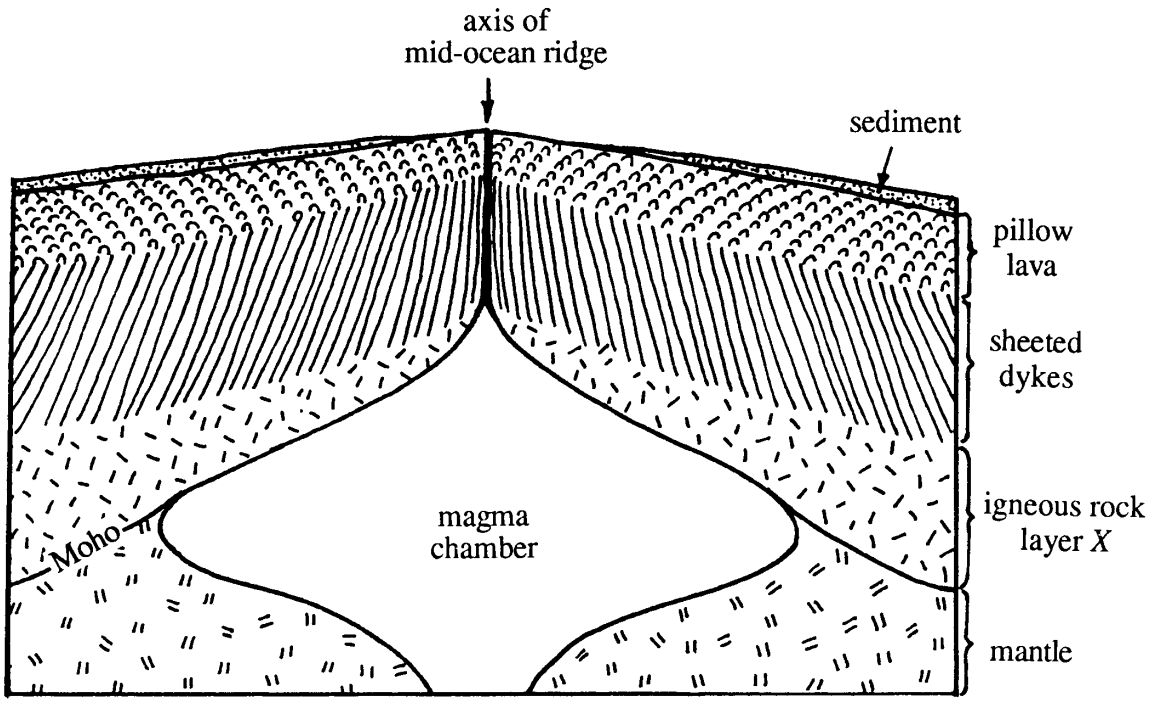
Which oil trap, *A B, C,* or *D,* is a stratigraphic oil trap?

(b) Describe TWO characteristics of the cap rock of the oil traps which enable the oil to accumulate.

17. The Land and Environment Court of NSW recently refused an application for a new open-cut coal mine near Scone, in the Hunter Valley. Some objections to the mine were made by the owners of vineyards, wineries, and tourist facilities.

Outline THREE likely reasons for these objections.

18. The diagram below shows a hypothetical section through a mid-ocean ridge.



(a) Crystallization of the magma chamber produces igneous rock layer *X*. Name a rock that makes up this layer.

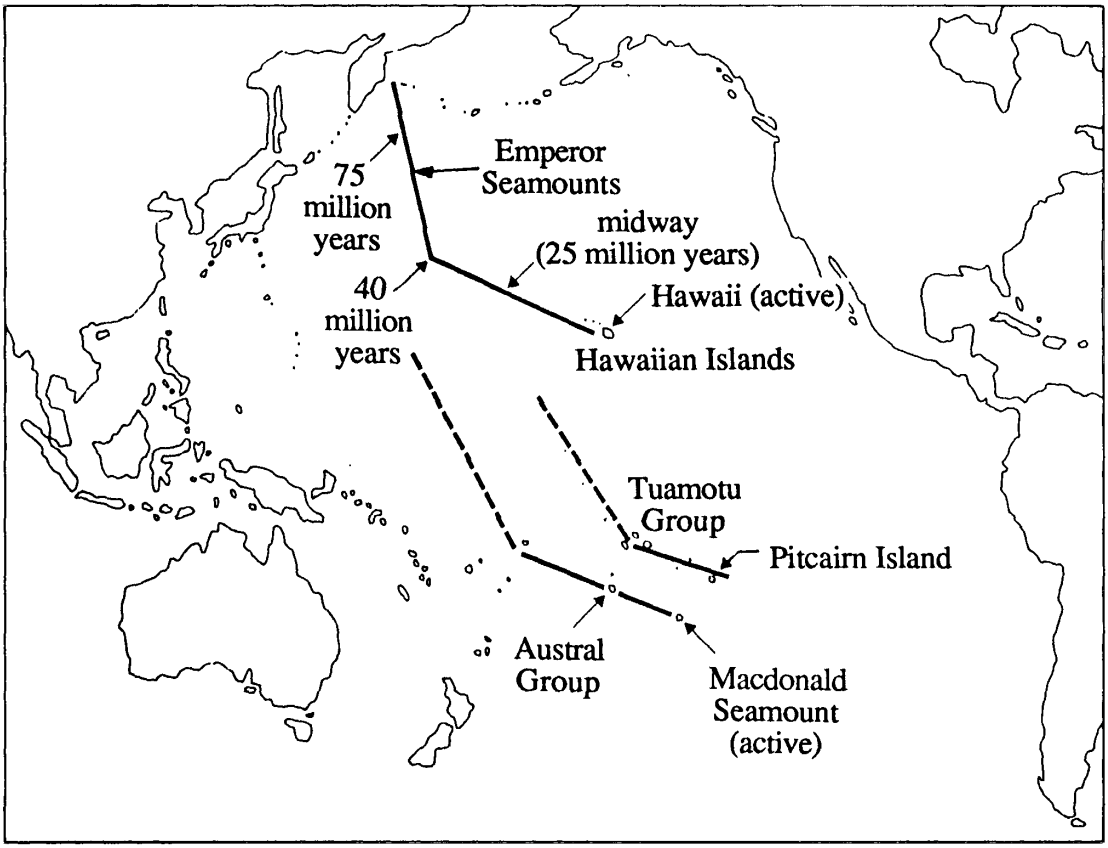
(b) Describe the type of sediment that accumulates on top of the pillow lavas.

(c) Briefly explain why sediment thickness increases with distance from the ridge axis.

19. The underground gold mine at Cobar in the west of NSW has been opened and closed a number of times in its history.

Discuss THREE factors that may lead to decisions to open or close this mine. In your answer, state whether each factor relates to the opening or the closing of the mine.

20. The diagram below shows the distribution of linear volcanic chains in the Pacific Ocean. The dashed lines indicate linear seamount chains extending to the north from the Austral and Tuamoto groups subparallel to the Emperor seamount chain.



(a) Explain, in terms of plate tectonic theory, how such linear volcanic chains form.

(b) Explain why there is a bend in the Hawaii–Emperor chain.

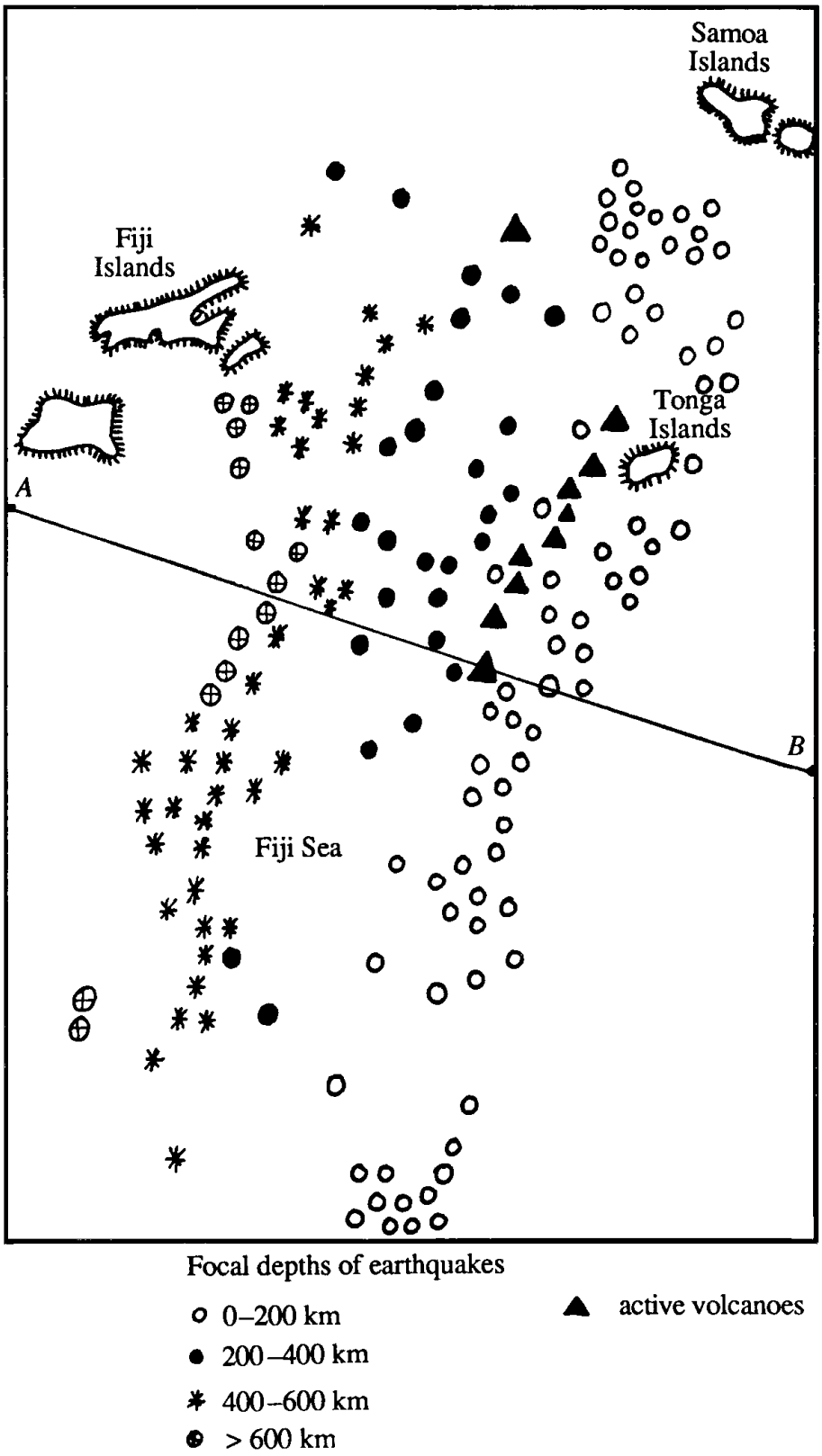
21. Many of the world's active fold-mountain chains are distributed around the margins of the Pacific Ocean.

(a) Name a rock typically found in these fold mountains.

(b) Describe the mineralogical composition of the rock you have chosen.

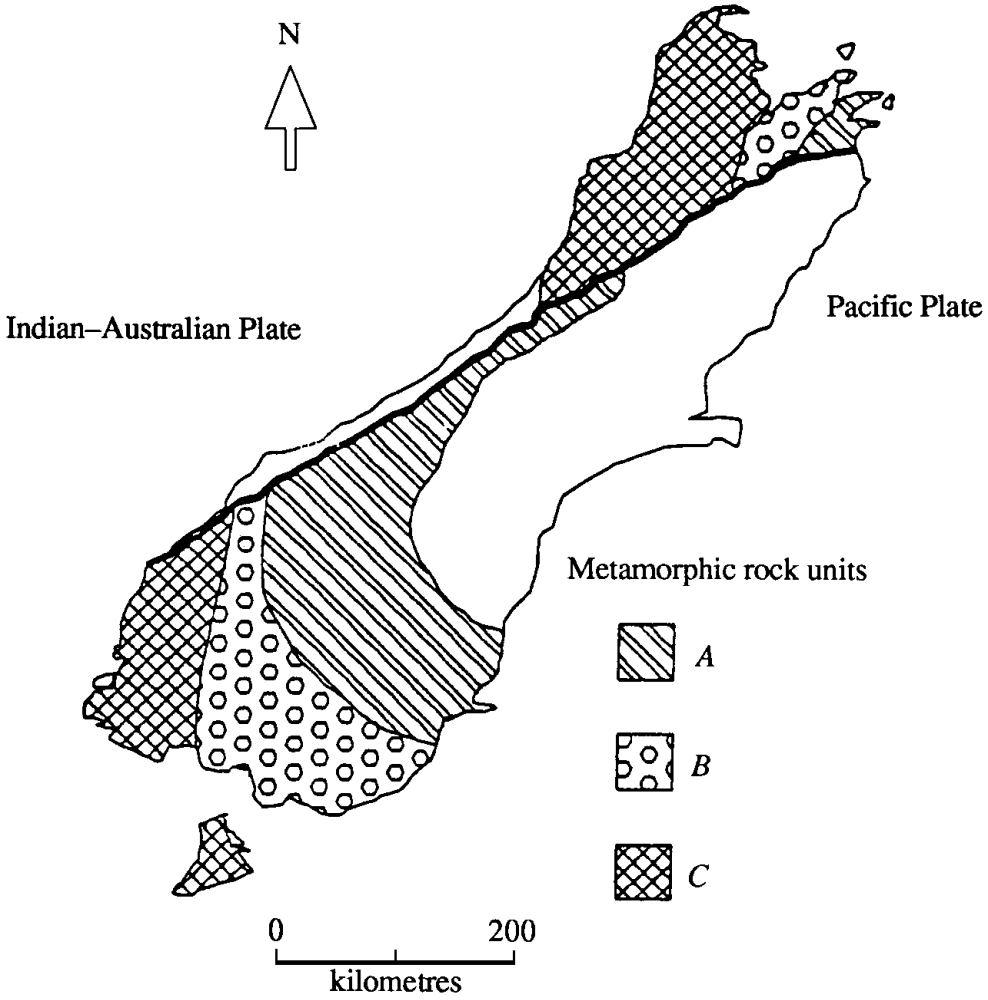
(c) With reference to the way these mountains formed, describe how the rock you have chosen formed.

22. The map below shows the distribution of active volcanoes and earthquakes in a region of the Pacific Ocean.



In the space in the Answer Book, draw a fully labelled cross-section from *A* to *B*. Show the major tectonic, topographic, and geological features that are responsible for the distribution of volcanoes and earthquakes in this region.

23. New Zealand is located on the boundary between the Pacific Plate and the Indian–Australian Plate. The diagram below is a simplified geological map of the South Island of New Zealand showing rock units *A*, *B*, and *C*.

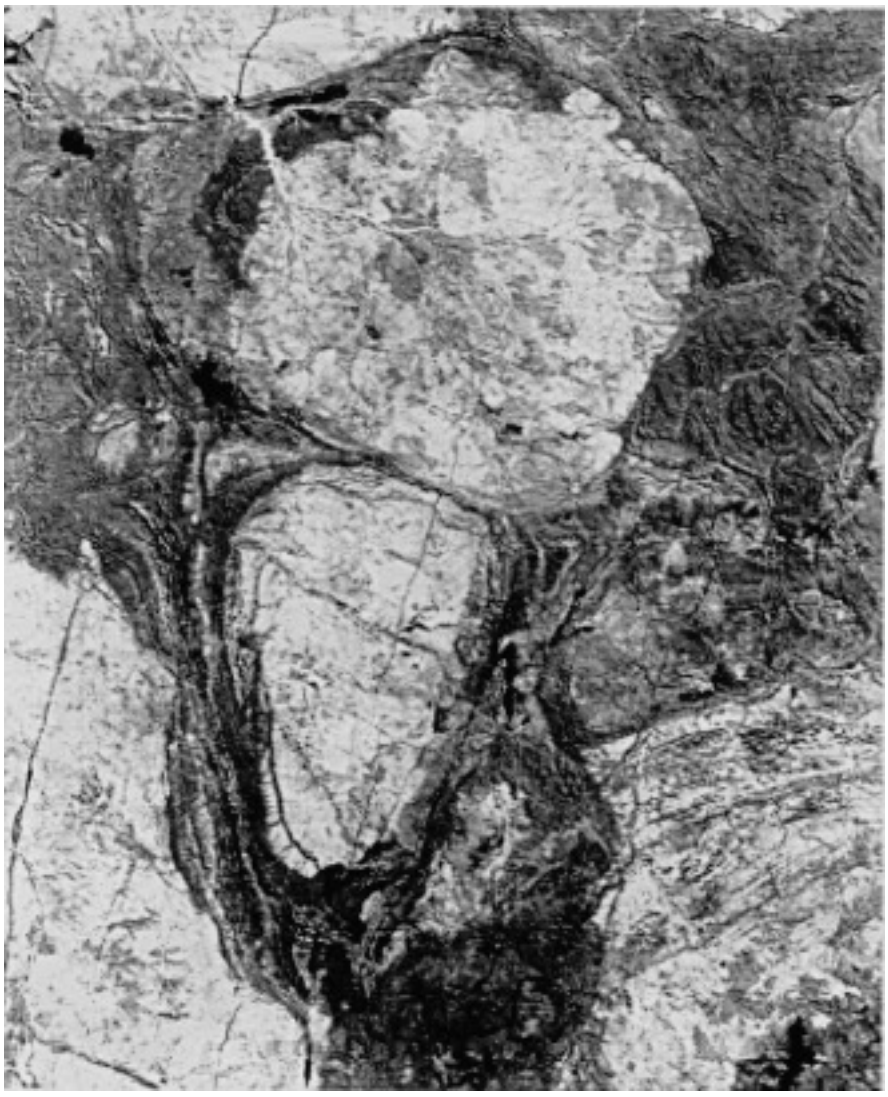


(a) Using the geological features shown, identify the type of plate boundary in this region.

(b) Determine the total amount of movement that has occurred at this plate boundary.

(c) Describe a geological hazard associated with this type of plate boundary.

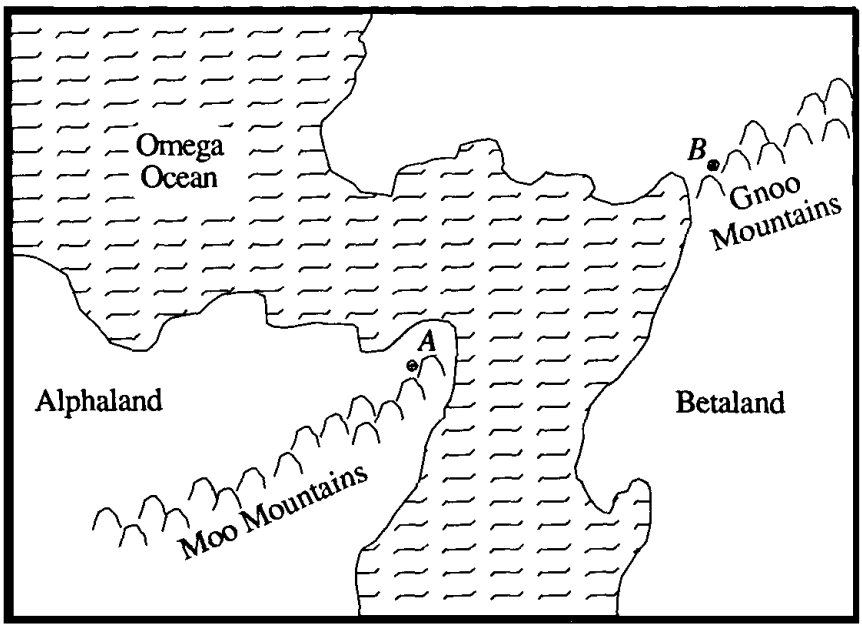
24. The satellite image below shows the Marble Bar area in Western Australia. Here Precambrian metamorphic rocks (dark tones) are intruded by plutons of granite (light tones).



(a) Give a geological name for this type of area.

(b) Briefly describe how an area with these geological structures and rock types could form.

25. A geologist is doing research for her doctoral thesis. She is accumulating evidence which supports her theory that Alphaland and Betaland shown on the map below were once joined. She has taken granite samples from the Moo Mountains at site *A* and the Gnoo Mountains at site *B*.



(a) Describe in detail how the geologist could obtain evidence to support her theory.

(b) Discuss ONE problem she may encounter in interpreting the evidence.

PART C

Questions 26–31 are worth 5 marks each.

Answer this Part in the Part C Answer Book.

26. Magnetometers are used in oceanic surveys to produce magnetic-anomaly maps.

Diagram A below is a simplified representation of the pattern of sea-floor magnetic anomalies observed on either side of a mid-ocean ridge. Diagram B shows the magnetic-polarity time-scale.

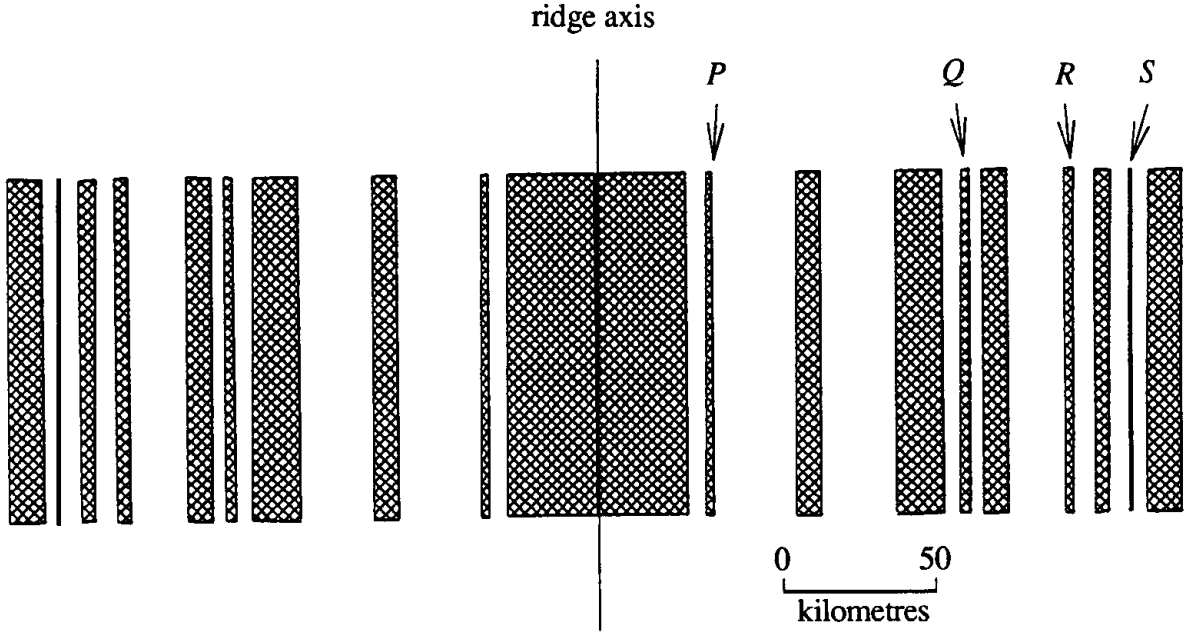


DIAGRAM A

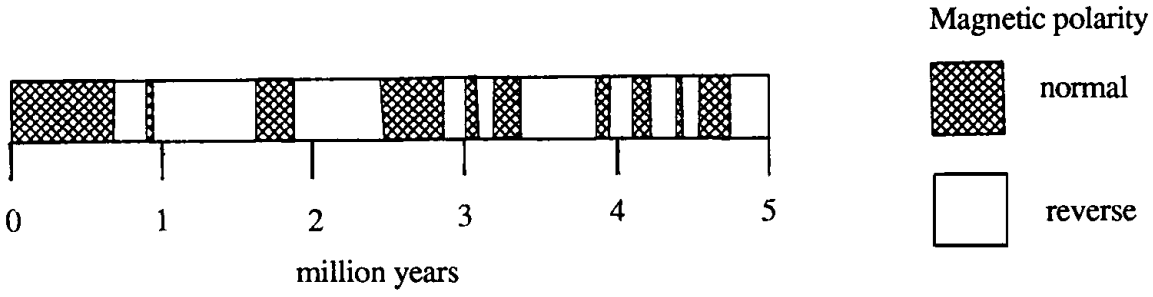


DIAGRAM B

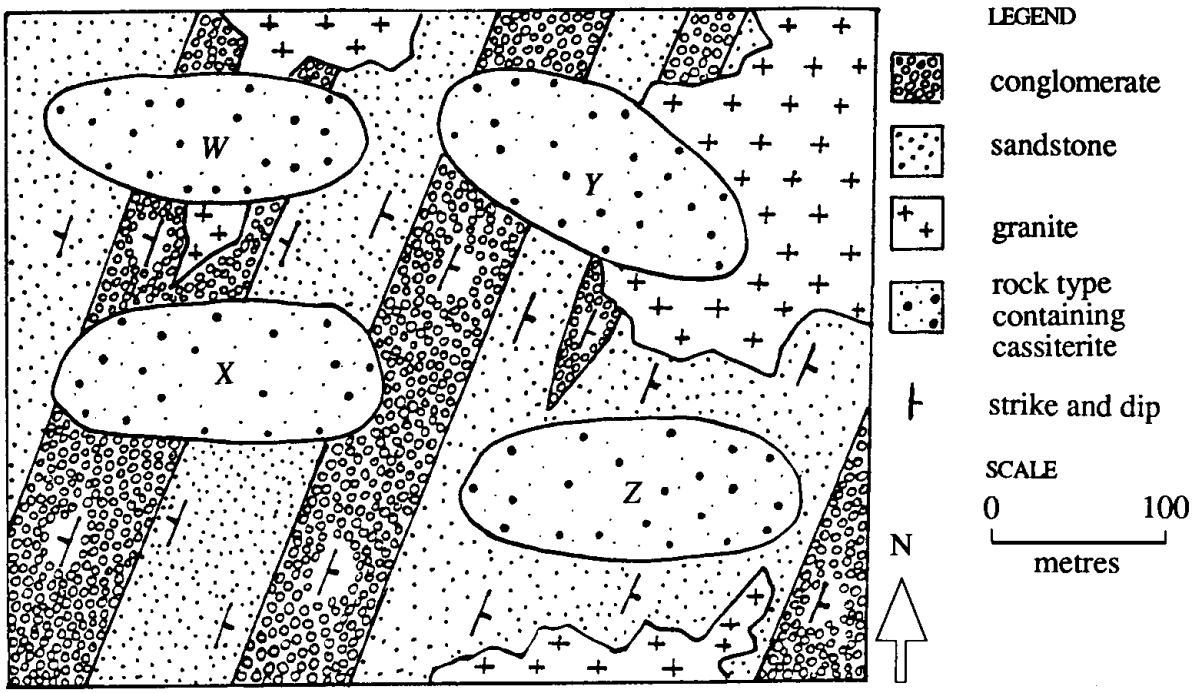
(a) Explain how the sea-floor magnetic-anomaly pattern is produced.

(b) By matching the labelled magnetic anomalies *P*, *Q*, *R*, and *S* with the magnetic-polarity time-scale,

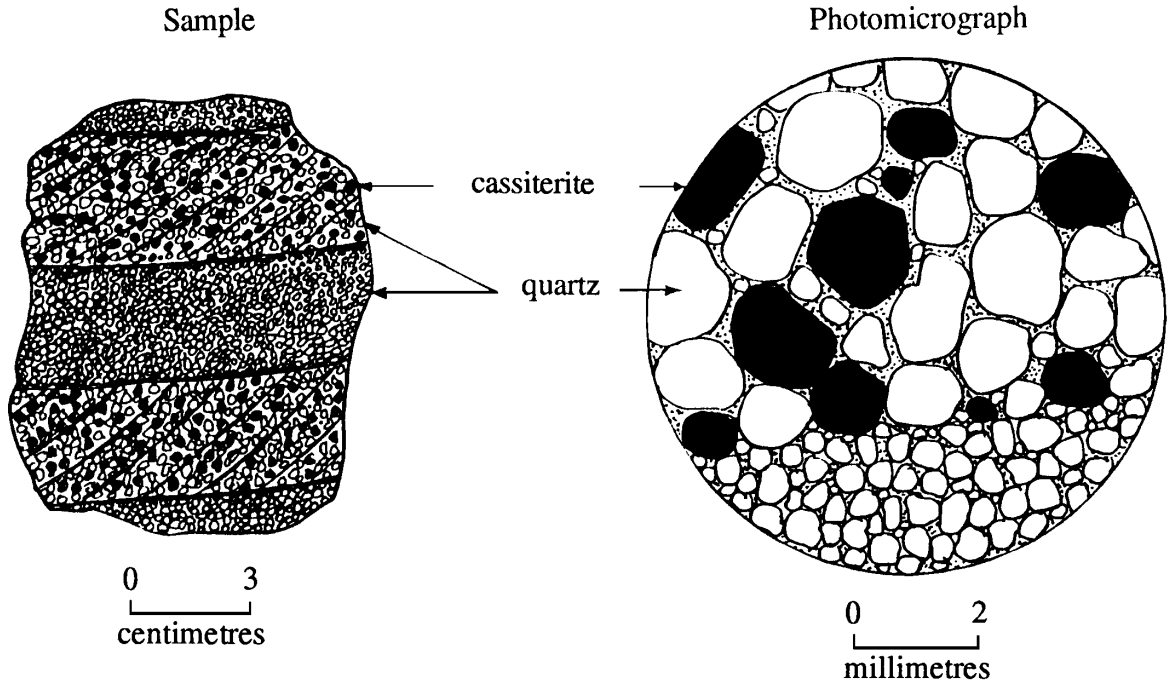
(i) plot distance versus time on the graph in your Answer Book;

(ii) calculate the rate of spreading for this ridge.

27. The map below shows four outcrops (*W*, *X*, *Y*, *Z*) of a rock containing the ore mineral cassiterite. Cassiterite is an ore of the metal tin.

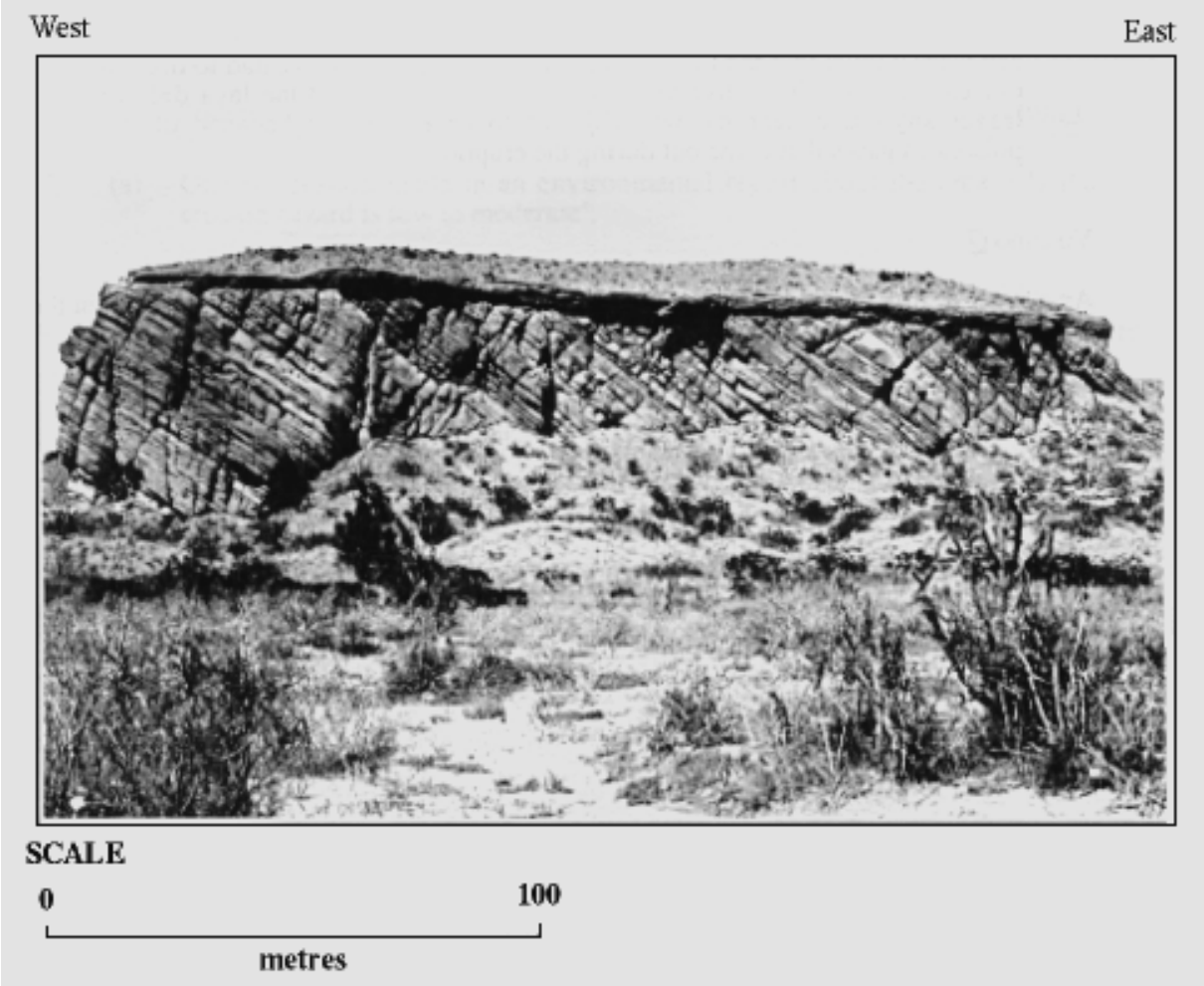


The diagrams below show a sample of the rock containing the cassiterite and a photomicrograph of the same sample.



27. (Continued)

The photograph below shows an outcrop in the map area that contains the ore mineral cassiterite. It was taken looking due north.



(a) Which outcrop, *W*, *X*, *Y*, or *Z*, is shown in the photograph?

(b) Describe in detail how this deposit could have formed. Begin with the original formation of the cassiterite and then describe the subsequent stages leading to its concentration in the outcrops shown on the map.

(c) Describe the method that would be used to mine this deposit.

28. This question refers to the following descriptions of volcanic activity.

Volcano *P*

A quote from Alan, a Year 8 student at a NSW high school, who lives on a volcanic island in the Pacific Ocean.

> When the volcano erupted, our plantation was covered in ash. The light-grey ash was so thick that the roof of our carport collapsed and we had to dig out our car. Although we live very close to the volcano and the lava did not travel anywhere near us, we still had to be evacuated because of the poisonous gases that came out during the eruption.

Volcano *Q*

An extract from a tourist brochure advertising joy rides over a volcano on an island in the Pacific Ocean.

> Our highly trained pilot will fly your helicopter right into the centre of an active volcano! Thrill to the sight of the heaving, bubbling lava lake and marvel at the rivers of lava which rush down the sides of the volcano and flow from the cracks and fissures that reach deep into the Earth.

Use your knowledge of volcanoes and the information given in these two descriptions to complete the table in the Answer Book.

29. The following information is an extract from a Government report. The report is about areas in the lower Blue Mountains where the dominant rock type is shale of the Wianamatta Group.

Slope class:	0–10% (up to 6°)
Parent material and topography:	Gently dipping broad shale caps over some ridge crests.
Soils:	Red podsolic (clay rich, hard setting).

(a) One conclusion made in an environmental report about the area was that 'soil erosion hazard is low to moderate'.

Explain why this conclusion could have been made.

(b) Discuss TWO geological problems that may arise as a result of major urban development (that is, construction of buildings and roads) in this area.

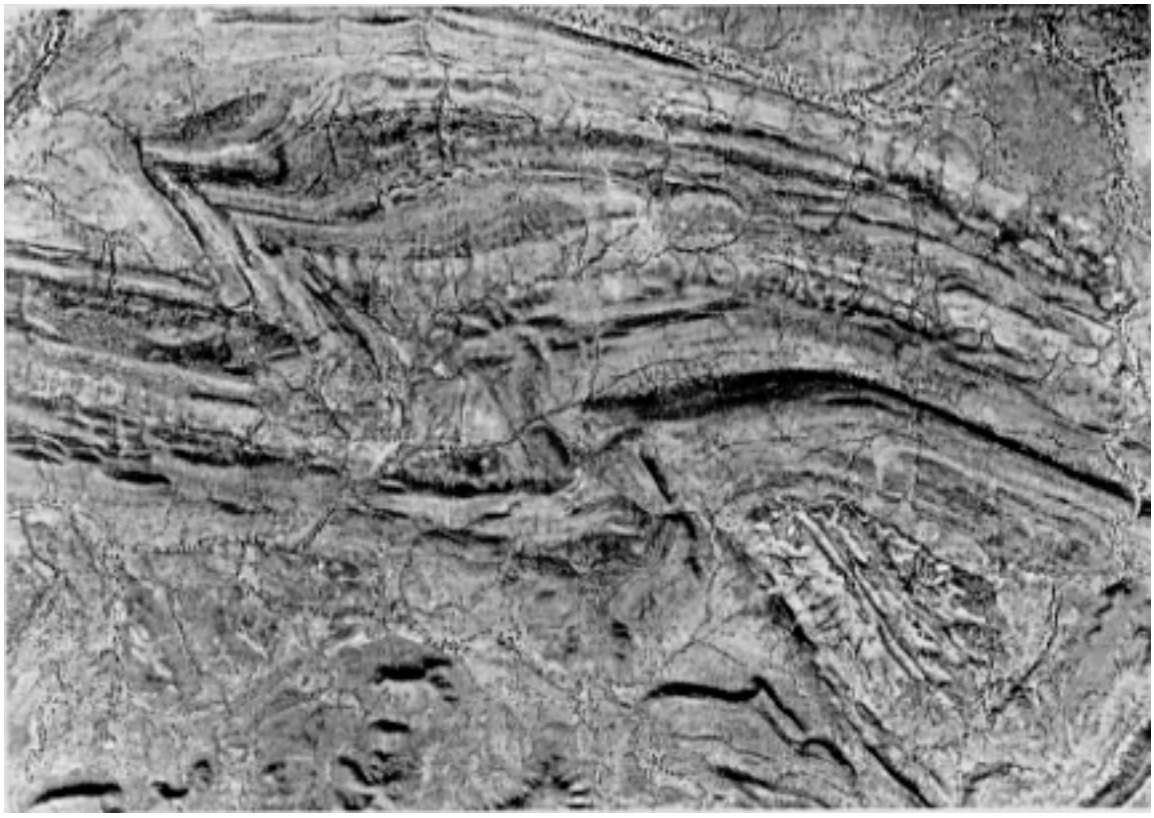
30. At the beginning of this century, Alfred Wegener put forward the theory of continental drift. One barrier to the wide acceptance of this theory was that people could not see how the continents could plough through the solid rock of the ocean floor.

(a) Describe in detail TWO pieces of land-based evidence for continental mobility.

(b) Describe the concept of 'isostasy'.

(c) How does an understanding of isostasy support the idea that continents can move?

31. The aerial photograph below shows a part of an old eroded mountain range in central Australia.



(a) (i) Sketch and describe ONE large-scale geological structure that is evident in the aerial photograph.

(ii) Explain how the geological structure you described in part (a) (i) is evident in the aerial photograph.

(b) Describe a tectonic setting where this kind of mountain range is forming today.

SECTION II—ELECTIVES

(25 Marks)

Attempt ONE question.

Answer the question in a *separate* Elective Answer Book.

Page

QUESTION 32. Contemporary Sedimentary Processes **Marks**

In this elective you have studied one of the following depositional environments:

- a river or stream
- a beach
- a lagoon or lake
- a bay, estuary, or delta
- a desert.

(a) (i) From the list above, name the environment you have studied. **3**

(ii) Draw a map of your environment area showing:

1. the main sediment types;
2. the direction(s) of movement of the transporting agent(s);
3. the location of samples collected.

(b) (i) Describe the source of the sediments in the environment you have studied and outline the investigation you carried out to determine this source. **4**

(ii) Describe the energy characteristics of the transporting agent(s) active in your environment. What evidence contained in the sediments supports your statements?

(c) Describe the variations in the properties (size, shape, and composition) of the sediments within your study environment. Outline the method(s) used for determining these properties of the sediments. **4**

(d) (i) Name and sketch THREE sedimentary structures that were identified in your environment. **6**

(ii) Describe the process involved in the formation of each of the structures named in part (d) (i).

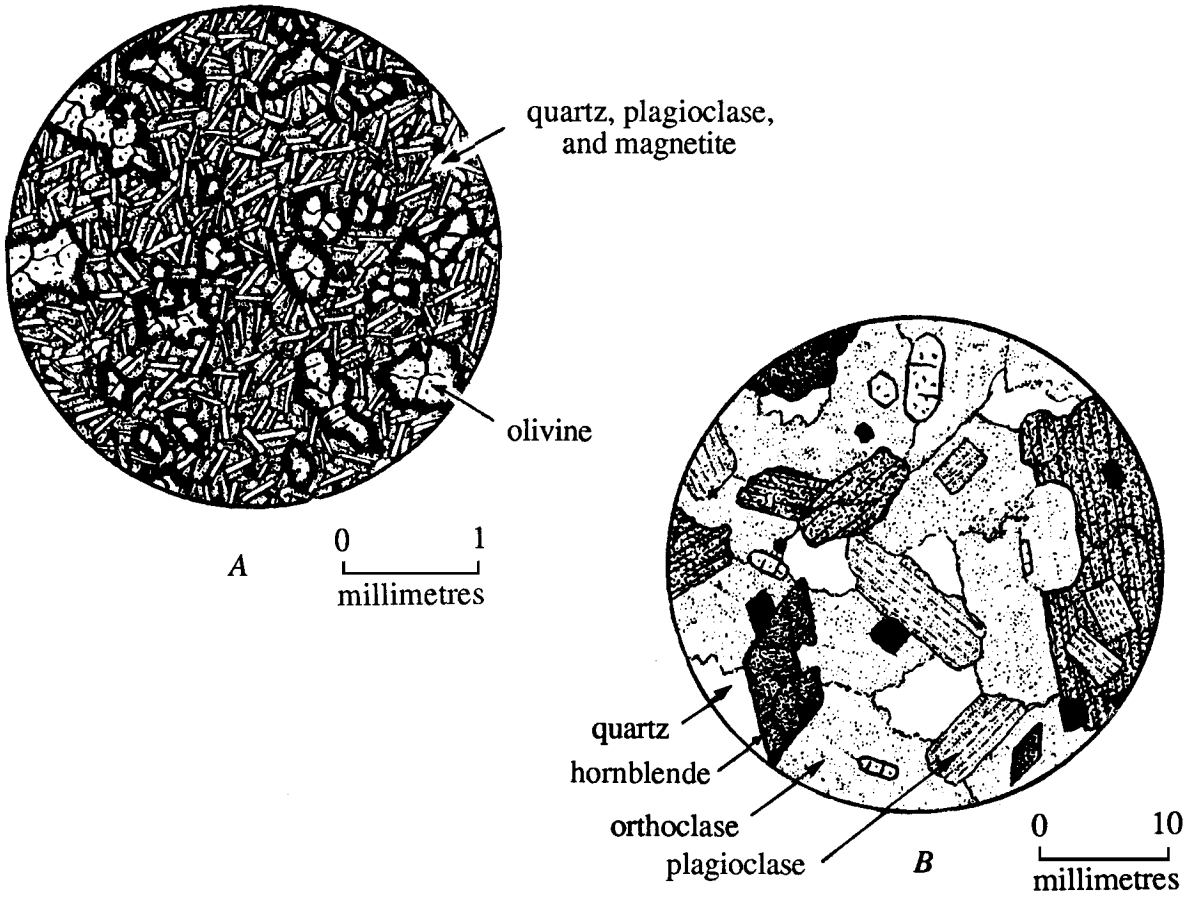
(e) Indicate the effects of human and other lifeforms on the depositional processes in your environment. **4**

(f) Imagine you are looking at a vertical cliff section of Permian sedimentary rocks. There is a deep gully running perpendicular to the main cliff face, which provides a three-dimensional view of the sedimentary units. **4**

Describe how an ancient sedimentary deposit, of the same sedimentary environment as that which you studied, would appear in outcrop in the main cliff face and the gully. Use labelled diagrams where appropriate.

QUESTION 33. Igneous Rocks **Marks**

(a) The following diagrams represent photomicrographs of two igneous rocks, *A* and *B*. **6**



(i) Name the texture shown in the diagram of rock *A*.

(ii) How would the composition of the plagioclase in rock *A* differ from that in rock *B*?

(iii) How did the conditions under which *A* crystallized differ from those under which *B* crystallized? Give reasons for your answer.

(iv) Name a rock that would have a composition similar to *A*, but a texture similar to *B*.

(v) State ONE specific tectonic setting in which rock *A* may have formed.

Question 33 continues on page 26

QUESTION 33. (Continued) **Marks**

(b) With reference to the plate-tectonic model, describe the process of generation of: **7**

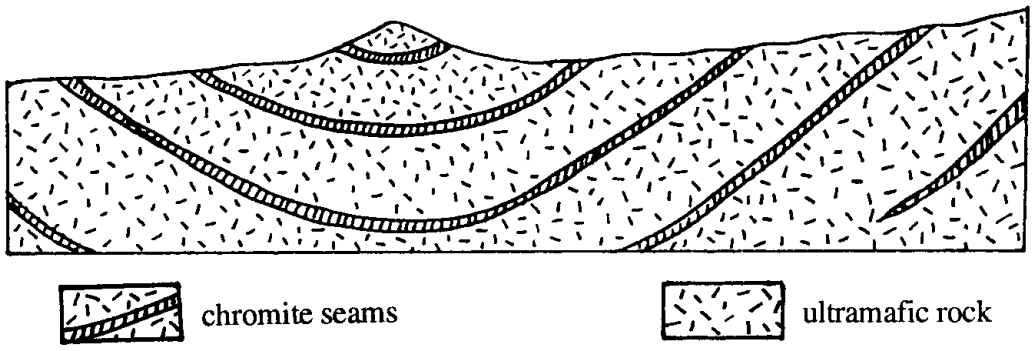
(i) magmas of basaltic composition;

(ii) magmas of andesitic composition.

(c) For each type of magma referred to in parts (b) (i) and (b) (ii), give a locality where it is being formed at present.

(d) Which magma would give rise to the more viscous lava? Give reasons for your answer.

(e) The geological section below shows part of the Great Dyke of Zimbabwe. It contains seams of chromite in a layered ultramafic rock. **5**



(i) Name and describe a process that may have led to the formation of the chromite seams in the Great Dyke.

(ii) Name and describe a different process that may lead to the formation of an ore deposit from an igneous magma.

QUESTION 33. (Continued) **Marks**

(f) The following table lists the chemical analyses of three igneous rocks (*X*, *Y*, and *Z*), expressed as weight per cent of oxides. **7**

	Rock *X*	Rock *Y*	Rock *Z*
SiO_2	43·9	49·9	70·8
TiO_2	0·8	1·4	0·4
Al_2O_3	4·0	16·0	14·6
Fe_2O_3	2·5	5·4	1·6
FeO	9·9	6·5	1·8
MnO	0·2	0·3	0·1
MgO	34·3	6·3	0·9
CaO	3·5	9·1	2·0
Na_2O	0·6	3·2	3·5
K_2O	0·2	1·5	4·1
P_2O_5	0·1	0·4	0·2

(i) Giving reasons, name the rock, *X*, *Y*, or *Z*, that would:

1. most likely contain orthoclase feldspar;
2. probably have crystallized at the lowest temperature;
3. likely contain most olivine;
4. most likely contain the least amount of feldspar.

(ii) Classify the rocks *X* and *Y* as felsic, intermediate, mafic, or ultramafic. Give reasons for your answer.

(iii) Suggest a possible name for rock *Z*. Give reasons for your answer.

QUESTION 34. Economic Geology **Marks**

In this elective you have studied TWO of the following:

(A) an economic deposit formed by igneous and/or metamorphic processes;

(B) an economic deposit formed or concentrated by weathering or sedimentary processes;

(C) an engineering project.

Read all questions before attempting your answers.

You MUST answer parts (a), (b), and (c).

(a) (i) Explain what is meant by the term 'economic deposit'. **5**

(ii) Discuss THREE factors that are important in determining the economic viability of a deposit.

(b) Answer *EITHER* part (i) *OR* part (ii). **10**

EITHER

(i) Choose ONE of your case studies from (A) or (B).

1. Name the deposit.
2. Describe the nature of the resource and its eventual use.
3. Draw a labelled geological cross-section showing the deposit and the surrounding geology. Include a scale.
4. Describe in detail how the deposit was formed or concentrated.
5. Describe the extraction/refining methods used, and the problems arising from the quality variation of the resource.

OR

(ii) You may answer this question if you studied case study (C).

1. Name the engineering project that you studied.
2. Explain why the particular location was chosen for this project.
3. Draw either a geological cross-section or a map, showing the features that were important in the development of the project.
4. Describe geological factors affecting design and construction.
5. Explain geological considerations that were taken into account during the operation or maintenance of this project.

QUESTION 34. (Continued) **Marks**

(c) Use your second case study [which may be (A), (B), or (C) but must NOT be the example used in part (b)] to answer the following questions. **10**

(i) Name the case study you have chosen.

(ii) Sketch a map of the area, showing the outline of the deposit or project and sites where testing and/or exploration were carried out.

(iii) If you were looking for a similar deposit, or a site for a similar project, outline which testing and/or exploration methods would be most effective. Give reasons for your answer.

(iv) Read the statement below.

> In the past, environmental issues were not given high priority in mining operations and engineering projects. Today, however, mining and engineering companies have become much more concerned with preservation and restoration of the environment.

Describe in detail the environmental considerations that were necessary during the development and operation of the mine or project.

QUESTION 35. Regional Geology **Marks**

(a) A geologist uses: **6**

- laboratory investigations
- maps
- air photos
- library studies

to obtain an understanding of the geology of an area.

Select THREE of the above techniques, and describe how a trained geologist would use them to obtain a better understanding of a region.

(b) In this Elective, you have studied ONE of the following regions: **13**

- North-Western Fold Belt
- Central and Southern Fold Belt (northern areas)
- Central and Southern Fold Belt (southern areas)
- New England Fold Belt
- Sydney Basin
- Clarence–Moreton Basin
- Great Artesian Basin
- Murray Basin.

(i) Name the region you have studied.

(ii) Sketch an outline map of NSW in the Answer Book. Show the location of your region and the location and names of the adjoining regions.

(iii) List the major rock units in your region in correct stratigraphic order, and indicate the geological period in which each formed.

(iv) Choose ONE of the rock units in your region.

1. Name the rock unit.
2. Describe the major lithologies.
3. How could the age of the rock unit be determined?
4. What is the relationship of the rock unit to surrounding rock units?
5. Describe the environment in which the rock formed.
6. How is this unit reflected in the geomorphology of the region?

QUESTION 35. (Continued)

(c) (i) Name ONE region that adjoins your region of study. **2**

(ii) Describe the nature of the boundary between your region and this adjoining region.

(iii) What is the age-range of rock units in the adjoining area?

(d) Choose one feature of economic importance within your region. **2**

(i) Name the economic resource.

(ii) Describe how this resource formed.

(iii) Explain why this resource is of economic importance.

(e) Choose a feature of special geological interest in your region. Such features include palaeontological or archaeological sites, artesian systems, civil-engineering projects, and spectacular scenic features. **2**

(i) Name the feature you have chosen.

(ii) Why is this feature of scientific interest?

QUESTION 36. Palaeontology **Marks**

(a) You have studied morphological changes in ammonites, trilobites, and graptolites, and the relationship of these changes to the environment. **11**

(i) Describe in detail the major morphological changes in TWO of these major fossil groups.

(ii) For ONE of the groups you have selected in part (i), describe how the morphological changes may relate to the environment in which the organism lived.

(iii) At the conclusion of the Palaeozoic era, all three groups became extinct. Describe ONE current theory regarding possible causes of these extinctions.

(b) Rich fossil deposits have been discovered in recent years at Riversleigh in Queensland. A large number of new species of fossil organisms has been established. **5**

Describe some of the problems and principles involved in classifying organisms from a large mixed deposit of fossils such as the one discovered at Riversleigh.

(c) In 1994, there was worldwide interest in the discovery of living specimens of the 'Wollemi Pine' in a remote area of the western Blue Mountains. Prior to this discovery, the only known examples of this tree were fossils from the Jurassic period. It was thought to have become extinct. **3**

Briefly outline THREE possible reasons for the fact that no fossil traces of the Wollemi Pine have been found in rocks younger than Jurassic.

QUESTION 36. (Continued) **Marks**

(d) Answer *EITHER* (i) *OR* (ii) *OR* (iii). **6**

EITHER

(i) It has been claimed that 50 per cent of the world's palaeontologists are employed by petroleum companies.

Discuss this claim. In your answer, refer to your knowledge of the use of fossils in stratigraphy, and the use of microfossils in petroleum exploration.

OR

(ii) With reference to an area you have studied, explain how fossil evidence can be combined with other evidence to determine the palaeoecology of that area.

OR

(iii) The drawings below represent skulls of organisms found from different stages of human evolution.

Australopithecus

Homo erectus (*Pithecanthropus*)

Homo neanderthalensis

Homo sapiens

Select TWO of these organisms. Explain their importance in the understanding of human development.

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GEOLOGY

2 UNIT

PART B ANSWER BOOK

DIRECTIONS TO CANDIDATES

- Write your Student Number and Centre Number at the top right-hand corner of this page.
- You should receive this Answer Book with a Part A Answer Sheet, Part C Answer Book, and an Elective Answer Book.
- Attempt ALL questions.
- Answer Questions 16 to 25 in this Answer Book.
- Each question is worth 3 marks.

EXAMINER'S USE ONLY

PART	Mark	Examiner	Check
B			

Attempt ALL questions.
Each question is worth 3 marks.
Answer the questions in the spaces provided in this paper.
You should show sufficient working to allow the examiner to follow your method.

EXAMINER'S USE ONLY

16. (a) .....

(b) .....

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17. Reason 1 .....

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Reason 2 .....

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Reason 3 .....

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18. (a) .....

(b) .....

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(c) .....

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EXAMINER'S USE ONLY

19. Factor 1 .....

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Factor 2 .....

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Factor 3 .....

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20. (a) .....

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(b) .....

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21. (a) .....

(b) .....

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(c) .....

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EXAMINER'S USE ONLY

22. A B

23. (a) .....

(b) .....

(c) .....

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24. (a) .....

(b) .....

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25. (a) .....

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(b) .....

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PART C ANSWER BOOK

DIRECTIONS TO CANDIDATES

- Write your Student Number and Centre Number at the top right-hand corner of this page.
- You should receive this Answer Book with a Part A Answer Sheet, Part B Answer Book, and an Elective Answer Book.
- Attempt ALL questions.
- Answer Questions 26 to 31 in this Answer Book.
- Each question is worth 5 marks.

EXAMINER'S USE ONLY

PART	Mark	Examiner	Check
C			

Attempt ALL questions.

Each question is worth 5 marks.

Answer the questions in the spaces provided in this paper.

You should show sufficient working to allow the examiner to follow your method.

EXAMINER'S USE ONLY

26. (a) .....

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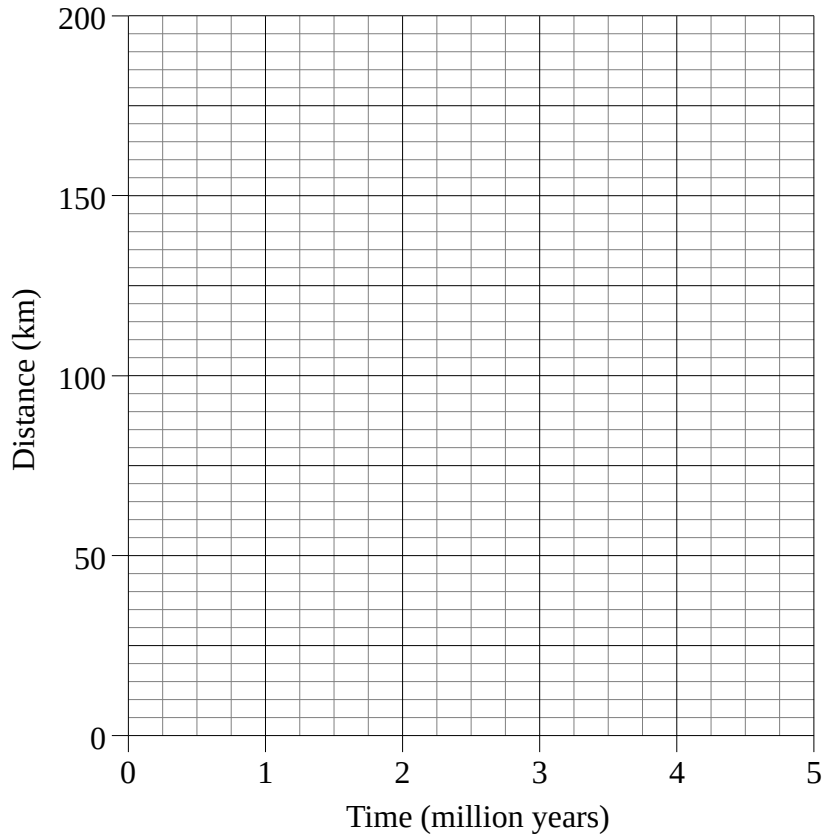
(b) (i)



(ii) .....

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EXAMINER'S USE ONLY

27. (a) .....

(b) .....

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(c) .....

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28.

	Volcano P	*Volcano Q*
1. Shape of volcano		
2. Internal structure of volcano		
3. Style of eruption		
4. Name of volcanic rock likely to be formed by the volcano		
5. Likely plate-tectonic setting		

EXAMINER'S USE ONLY

29. (a) .....

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(b) Problem 1 .....

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Problem 2 .....

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30. (a) First piece of evidence .....

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Second piece of evidence .....

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(b) .....

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(c) .....

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EXAMINER'S USE ONLY

31. (a) (i) Sketch of structure

Description of structure

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(ii) .....

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(b) .....

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