Surname	Centre Number	Candidate Number
Other Names		2

GCE AS/A Level – LEGACY

1211/01

S19-1211-01

GEOLOGY – GL1
Foundation Unit

MONDAY, 13 MAY 2019 – MORNING

1 hour

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
1.	**14**	
2.	**16**	
3.	**14**	
4.	**16**	
Total	**60**	

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ADDITIONAL MATERIALS

In addition to this examination paper, you will need:

- the Mineral Data Sheet;
- a calculator;
- a protractor.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

You are reminded that marking will take into account the use of examples and the quality of communication used in your answers.

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Answer **all** *questions.*

1. **Figure 1a** is a cross-section of a cliff face showing the true dip of the beds.

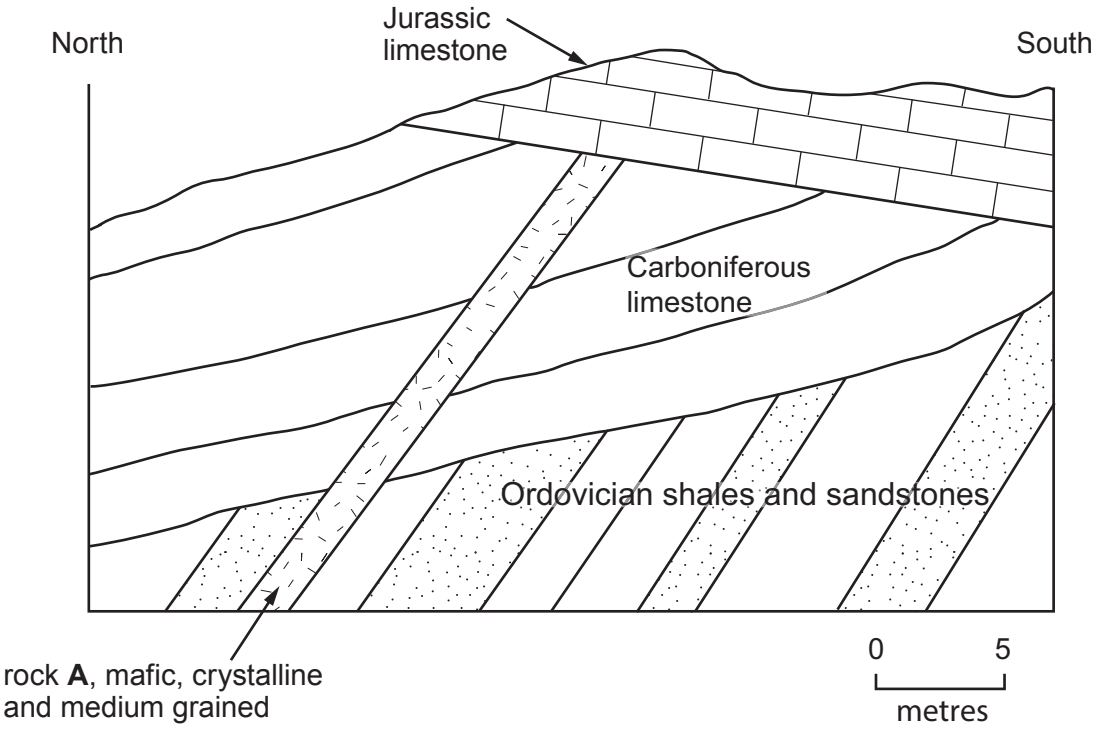

Figure 1a

(a) (i) State the dip direction and angle of dip of the Ordovician shales and sandstones. [2]

Dip direction ..... Angle of dip .....°

(ii) On **Figure 1a** show with an arrow and label the following features: [2]

- a Mesozoic rock
- an unconformity

(iii) Suggest a name for rock **A** and state a geological period during which it was most likely to have been formed. [2]

Name of rock **A** .....

Period when formed .....

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(b) **Figure 1b** shows a decay curve for a radioactive element found in a mineral in rock **A**.

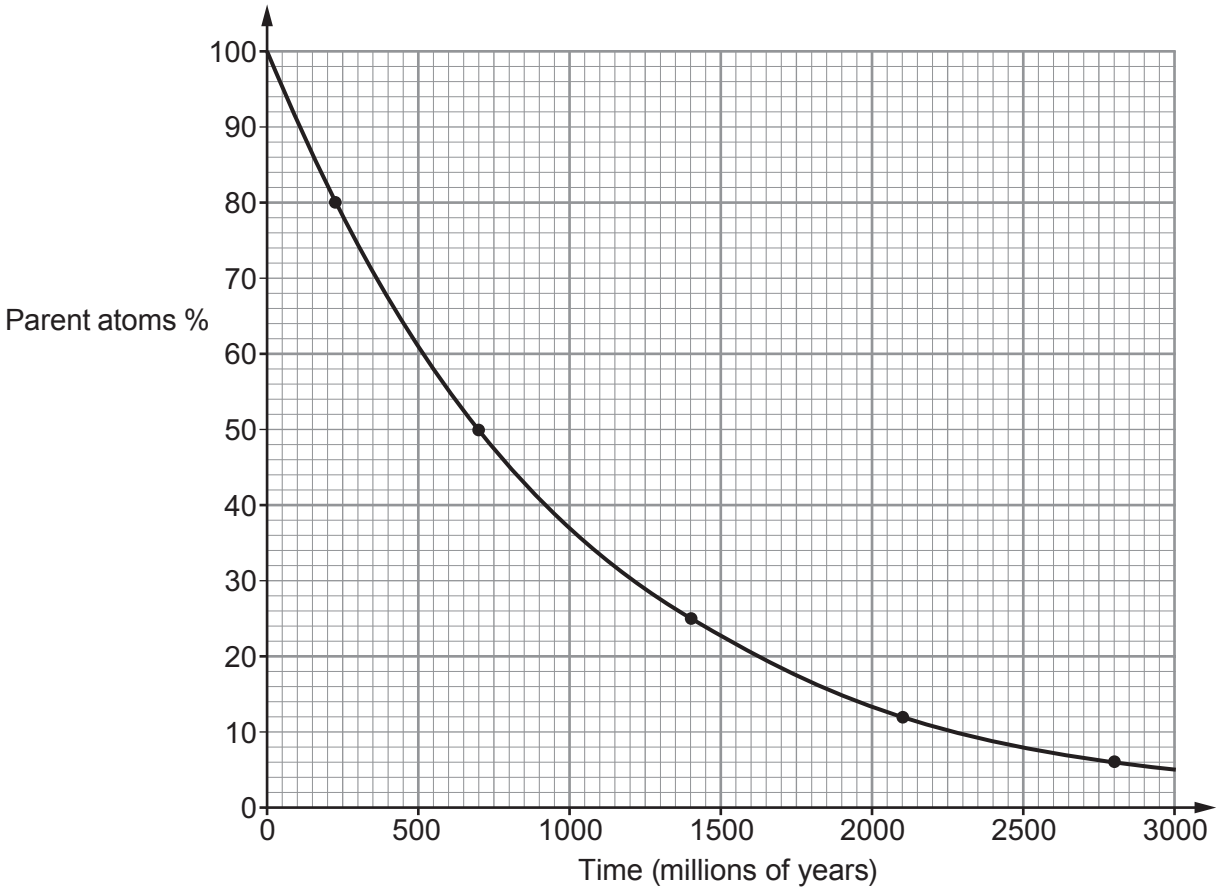

Figure 1b

Refer to **Figure 1b**.

(i) State the half-life of the radioactive element. [1]

..... million years

(ii) A sample analysed from rock **A** was found to contain 80% parent atoms and 20% daughter atoms. Using **Figure 1b** state the age of rock **A**. [1]

Age of rock **A** ..... million years

(iii) Explain why the age calculated for rock **A** is considered to be a **minimum** age for rock **A**. [2]

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Refer to **Figure 1a**.

(c) A student concluded that rock **A** in **Figure 1a** is a dyke. Critically evaluate this conclusion. [4]

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2. **Figure 2a** shows an outcrop of igneous rock in the Scottish Highlands.

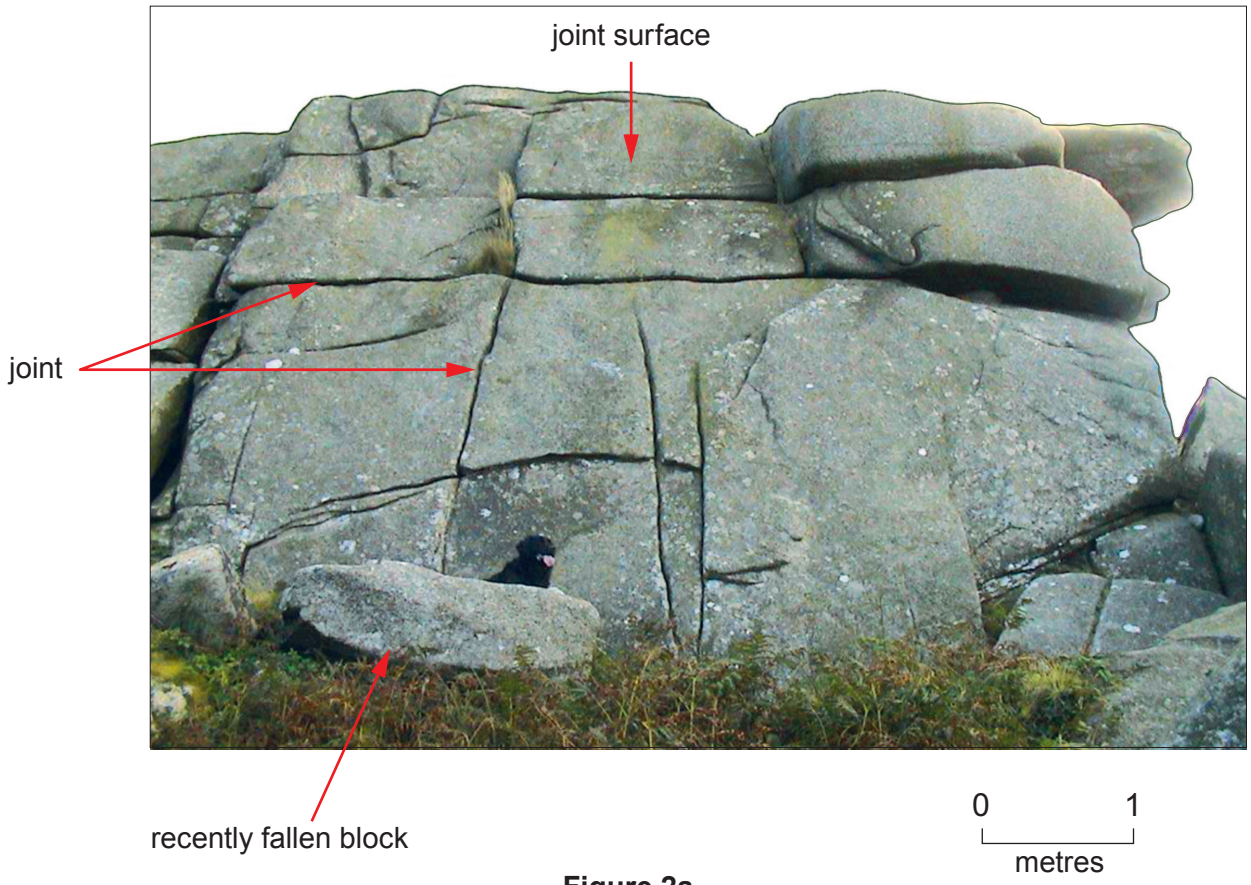

Figure 2a

Refer to **Figure 2a**.

(a) (i) Describe the pattern shown by the joints in the igneous rock in **Figure 2a**. [3]

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(ii) Explain how the joints shown in **Figure 2a** may have formed. [2]

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(iii) Name and describe **one** weathering process that might occur at this location. [3]

Weathering process .....

Description .....

.....

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(b) **Figure 2b** shows a hand specimen of the igneous rock from the outcrop in **Figure 2a**.

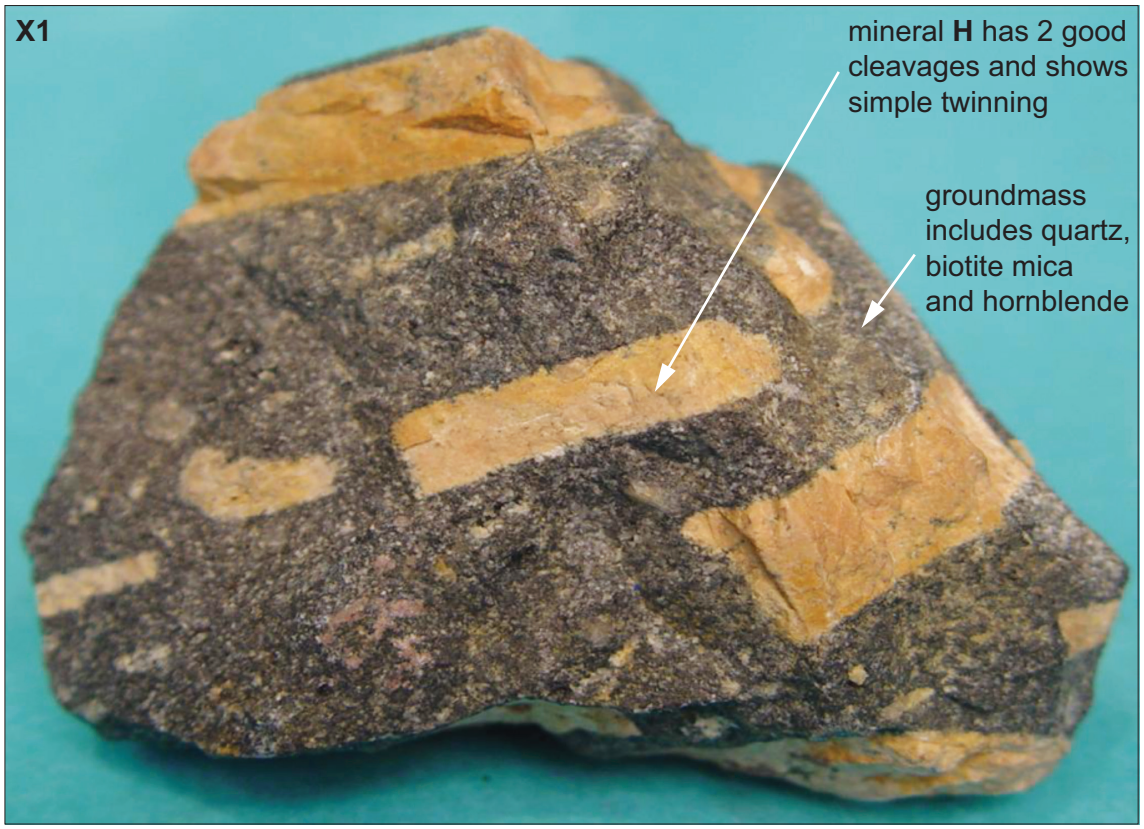

Figure 2b

Refer to **Figure 2b**.

(i) Name mineral **H**. You may wish to refer to the Mineral Data Sheet. [1]

Mineral **H** .....

(ii) Describe the texture of the igneous rock in **Figure 2b**. [4]

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(iii) Explain how the texture of the igneous rock shown in **Figure 2b** may have formed. [3]

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3. **Figure 3** shows three plate boundaries labelled **J-K**, **L-M** and **N-P** in South East Asia.

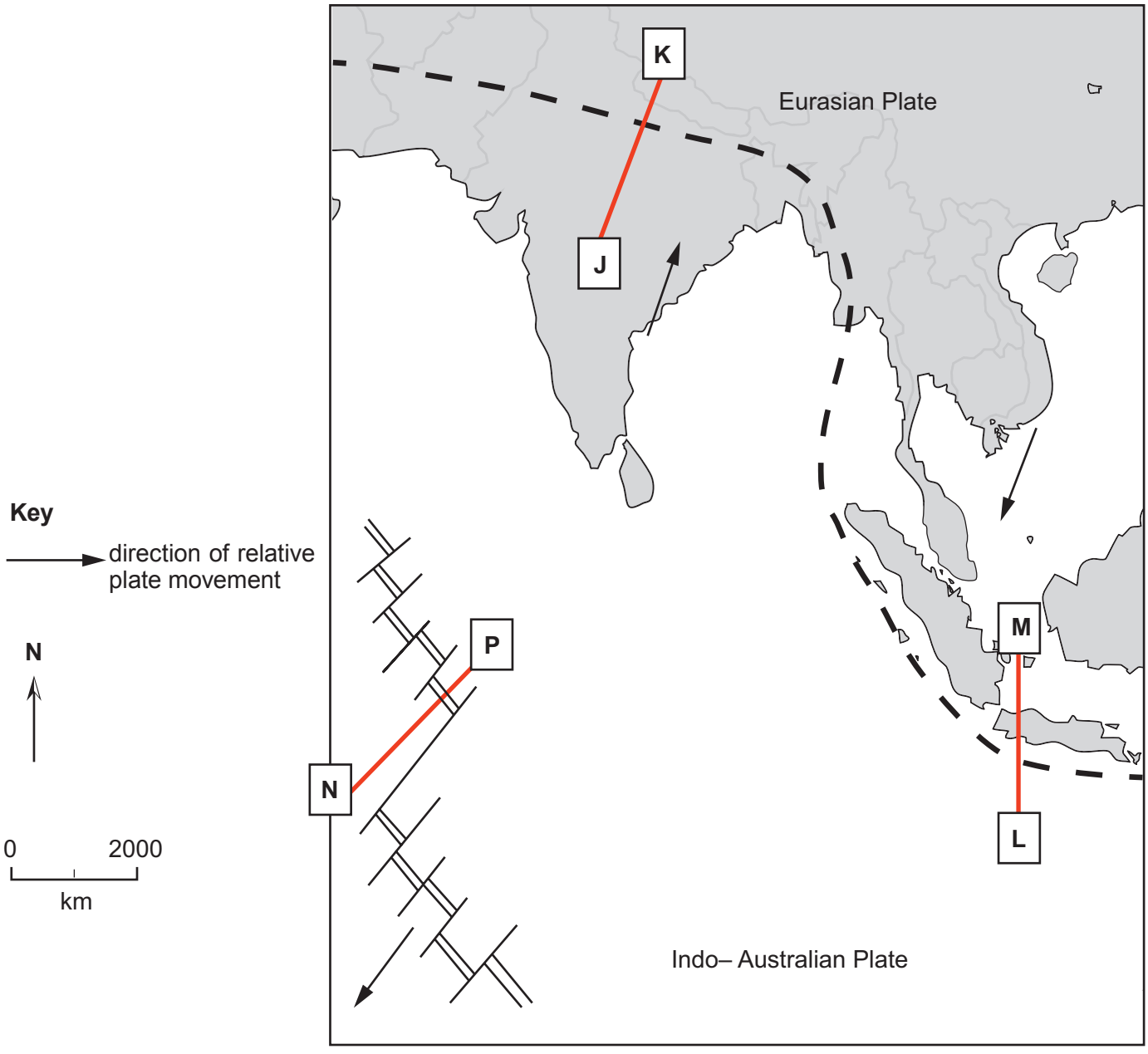

Figure 3

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(a) (i) Identify the type of plate boundary at each of the boundaries **J-K**, **L-M** and **N-P** shown in **Figure 3**. Choose from the options listed below. [3]

divergent boundary

convergent oceanic-oceanic boundary

convergent oceanic-continental boundary

convergent continental-continental boundary

conservative boundary

J-K .....

L-M .....

N-P .....

(ii) On **Figure 3** show with an arrow and label an example of each of the following: [2]

- island arc
- transform fault

(b) (i) Boundary **J-K** is volcanically inactive. Explain why there is an absence of volcanic activity at this plate boundary. [3]

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(ii) Boundary **N-P** is characterised by shallow focus earthquakes. Explain the origin of the seismic activity at this boundary. [2]

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(iii) Boundary **L-M** is characterised by explosive volcanoes, whilst Boundary **N-P** is associated with less explosive volcanoes. Describe and explain the processes responsible for the different types of volcanic activity at these boundaries. [4]

Boundary **L-M** .....

.....

.....

Boundary **N-P** .....

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4. **Figure 4a** shows examples of bivalve and brachiopod fossils.

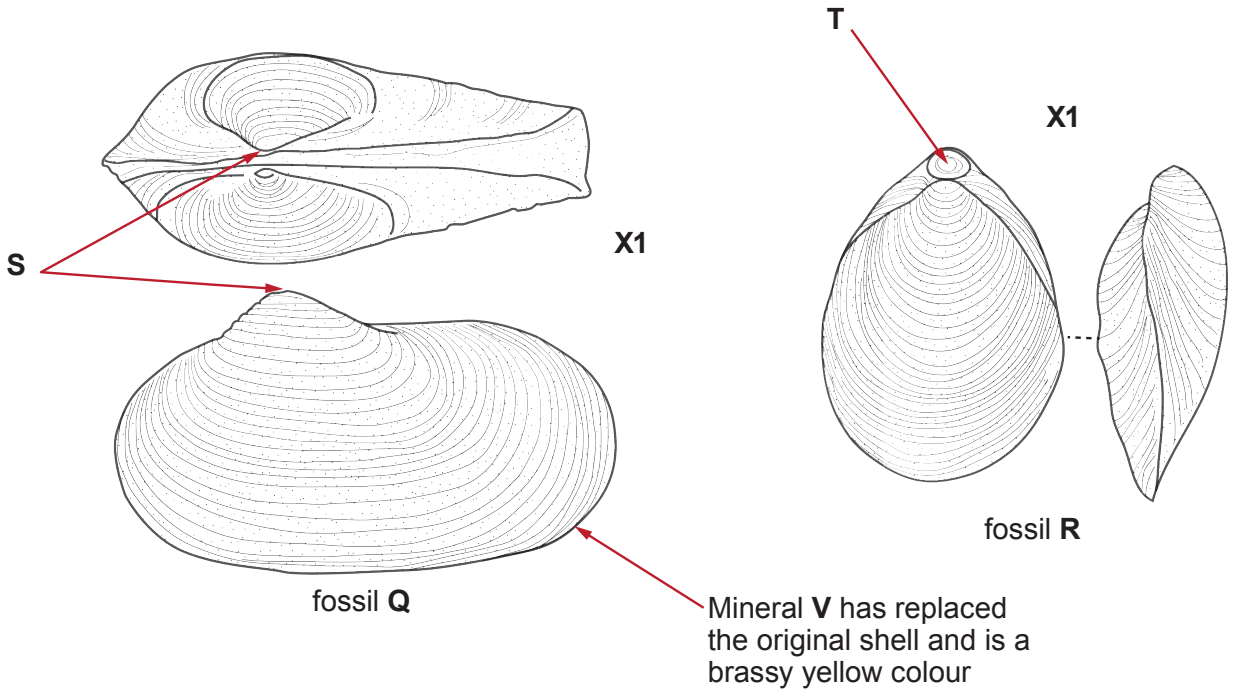

Figure 4a

Refer to **Figure 4a**.

(a) (i) Draw **two** lines on **Figure 4a** to represent planes of bilateral symmetry on fossil **Q** and fossil **R**. [2]

(ii) Name the fossil groups represented by fossil **Q** and fossil **R**. [1]

fossil **Q** ..... fossil **R** .....

(iii) Name the morphological features labelled **S** and **T**. [2]

S ..... **T** .....

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Figure 4b shows the evolutionary history of bivalves and brachiopods through geological time.

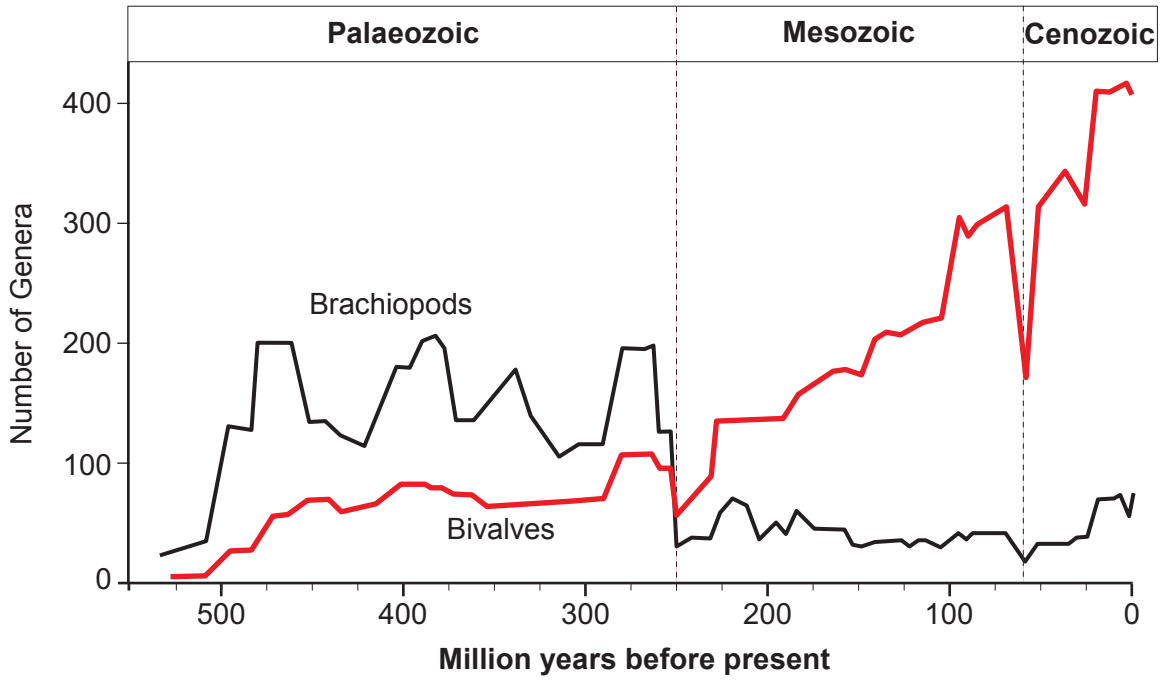

Figure 4b

Refer to **Figure 4b**.

(b) (i) Describe the evolutionary history of brachiopods over the last 500 million years. [3]

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(ii) State **two** differences between the evolutionary trends of bivalves and brachiopods shown in **Figure 4b**. [2]

Difference 1 .....

.....

Difference 2 .....

.....

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(iii) State the name of mineral **V** and explain why fossil **Q** is now made of this mineral. You may wish to make use of the Mineral Data Sheet. [3]

Mineral **V** .....

Explanation .....

.....

.....

(iv) Explain why bivalves and brachiopods fossils are often found in large numbers in sedimentary rocks. [3]

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END OF PAPER

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