

OCR

Oxford Cambridge and RSA

Monday 16 May 2016 – Morning

AS GCE GEOLOGY

F791/01 Global Tectonics

Candidates answer on the Question Paper.

OCR supplied materials:

None

Other materials required:

- Ruler (cm/mm)
- Protractor

Duration: 1 hour




Candidate forename		Candidate surname	
-----------------------	--	----------------------	--

Centre number						Candidate number				
---------------	--	--	--	--	--	------------------	--	--	--	--

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. If additional space is required, you should use the lined page(s) at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
-  Where you see this icon you will be awarded a mark for the quality of written communication in your answer.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.
- This document consists of **16** pages. Any blank pages are indicated.

Answer **all** the questions.

1 (a) (i) What is a meteorite?

.....
..... [1]

(ii) State where most meteorites come from in space.

.....
..... [1]

(b) (i) Name **one** metal, other than iron, that is found in iron meteorites.

..... [1]

(ii) State the composition of stony meteorites.

..... [1]

(iii) Meteorites can be used to provide evidence for the composition of layers of the Earth.

State the layers of the Earth that have the same composition as iron and stony meteorites.

iron meteorite [1]

stony meteorite [1]

(c) Describe the evidence for impact craters.

.....
.....
.....
..... [2]

- (d) The list below gives the names of some of the characteristic features of the continents and oceans.

abyssal plain

continental shelf

continental shield

fold mountains

mid-ocean ridge

ocean trench

Match each description in the table with the correct feature from the list above.

Description	Feature
deep ocean basin, underlain by mafic crust, aseismic	
linear submarine mountain range, mafic volcanoes, has an axial rift valley, seismic area	
linear belt, folded sedimentary rocks, reverse faults, metamorphic and igneous rocks common, seismic area	
stable and aseismic, metamorphic and igneous rocks, very old and low relief	

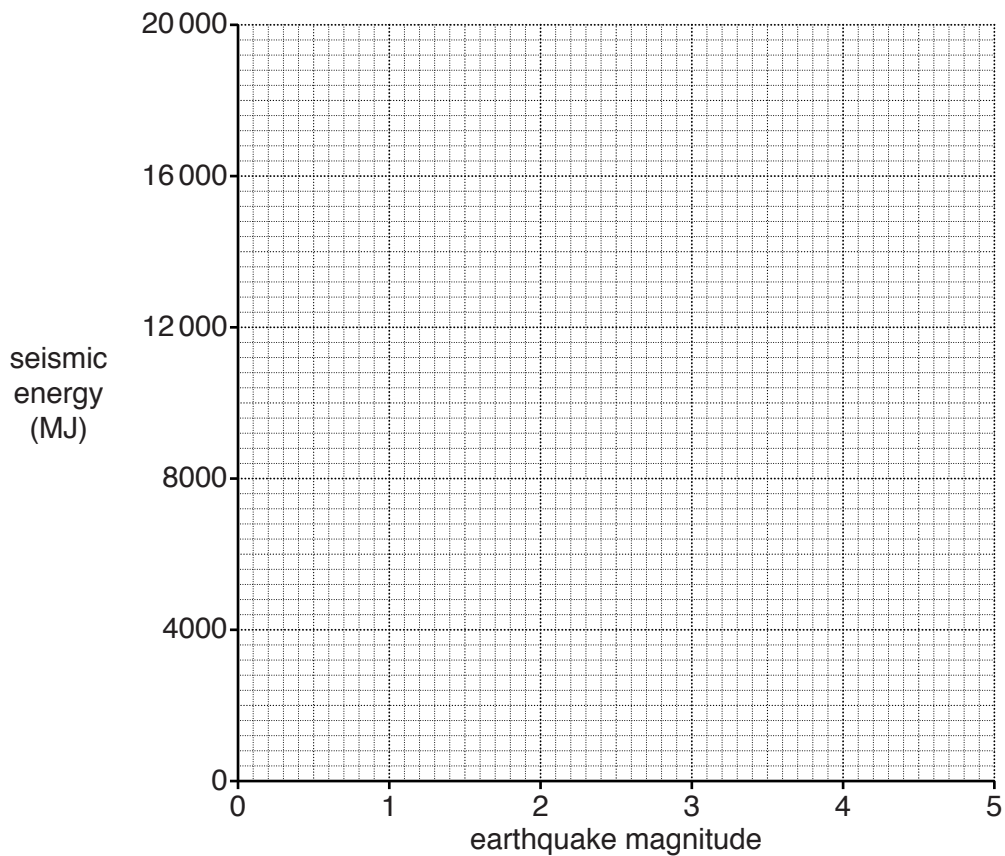
[3]

[Total: 11]

- 2 (a) The magnitude of an earthquake is linked to the seismic energy released. The table below shows seismic energy released for each magnitude up to 5.

Earthquake magnitude	Seismic energy (MJ)
1	2
2	63
3	1995
4	6310
5	19953

- (i) Using the data in the table, plot a line graph to show the seismic energy released at each magnitude.



[3]

- (ii) Describe the pattern shown by the graph.

.....
 [1]

- (iii) The greatest magnitude recorded for an earthquake is 9.5 in Chile in 1960.

Suggest why it is unlikely that there will be a magnitude 10 earthquake.

.....
 [1]

(iv) State the name for the scale that measures earthquake magnitude.



In your answer, you should use the appropriate technical term, spelled correctly.

..... [1]

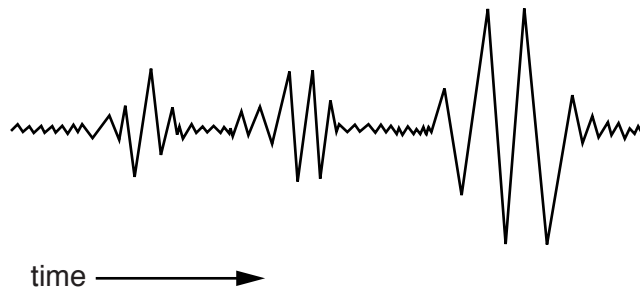
(b) After an earthquake, different locations on the Earth's surface will receive different seismic waves. The table below shows statements about seismic waves and various locations on the Earth's surface.

Use the letters **A**, **B**, **C** or **D** to match the statements to the correct locations.

Statement		Location (epicentral angle)	Statement A, B, C or D
A	P and S waves arrive	at the epicentre (0°)	
B	very strong L waves occur	between 103° and 142°	
C	no P or S waves arrive	between 103° and 103°	
D	no S waves arrive	between 0° and 103°	

[3]

(c) The diagram below shows a seismogram for a single earthquake event.



(i) On the seismogram above, label the **L**, **P** and **S** waves. [1]

(ii) Explain why **P** and **S** waves are called body waves.

.....
 [1]

(iii) Describe how **P** and **S** waves have been used to determine the size and state of the outer core.

size of the outer core

.....

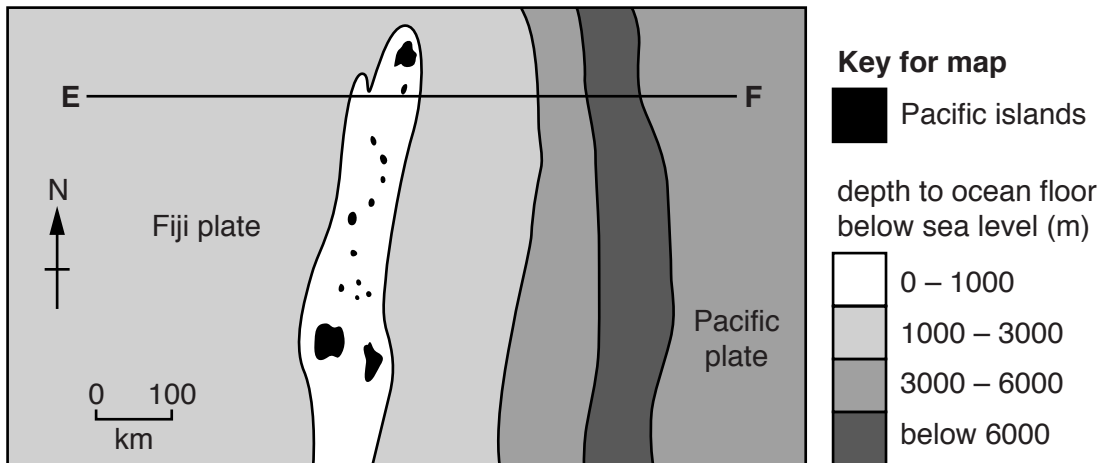
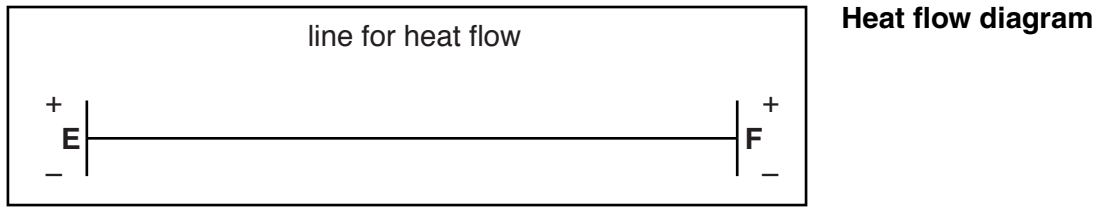
state of the outer core

.....

[2]

[Total: 13]
 Turn over

- 3 (a) The map below shows the depth of the ocean floor below sea level around a group of Pacific islands. The heat flow diagram above the map is a cross-section of the same area.



- (i) On the map above, label the:
- deep-ocean trench
 - island arc.
- [2]

- (ii) Draw **two** arrows on the map to show the directions of movement of both plates. [1]

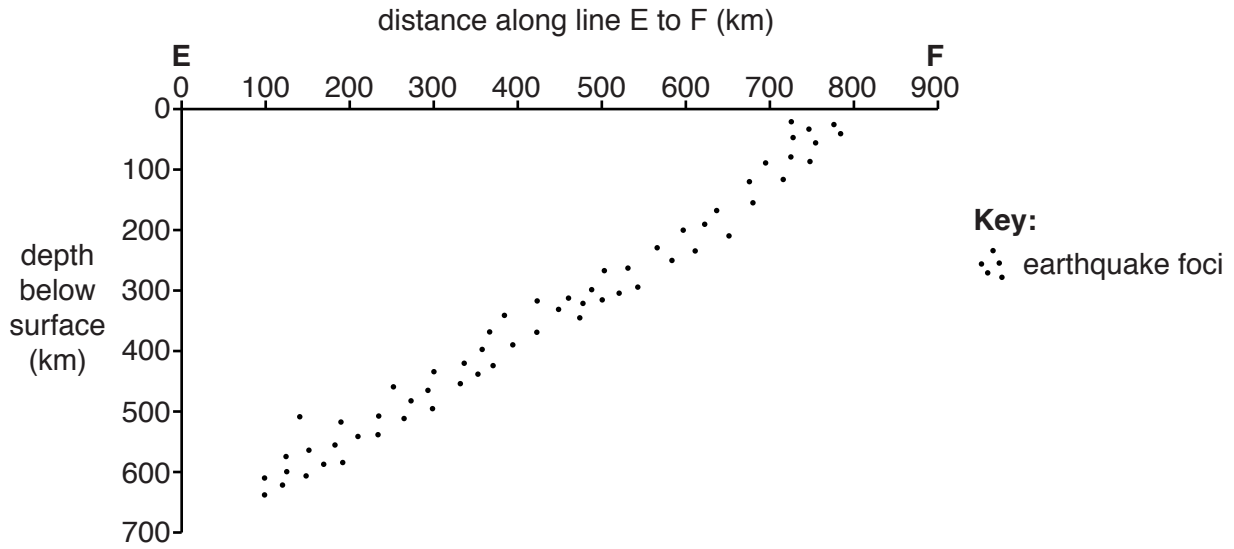
- (iii) Name the type of plate margin shown on the map.
 [1]

- (b) (i) On the heat flow diagram above the map, draw a line to show the heat flow anomalies between **E** and **F**. [1]

- (ii) Explain the pattern of heat flow along the line **E** to **F** that you have drawn.

 [2]

(c) The graph below shows the depth of earthquake foci beneath the Pacific Islands along the line of section **E** to **F**.



(i) Sketch a cross-section of the Fiji plate and the Pacific plate on the graph above. [1]

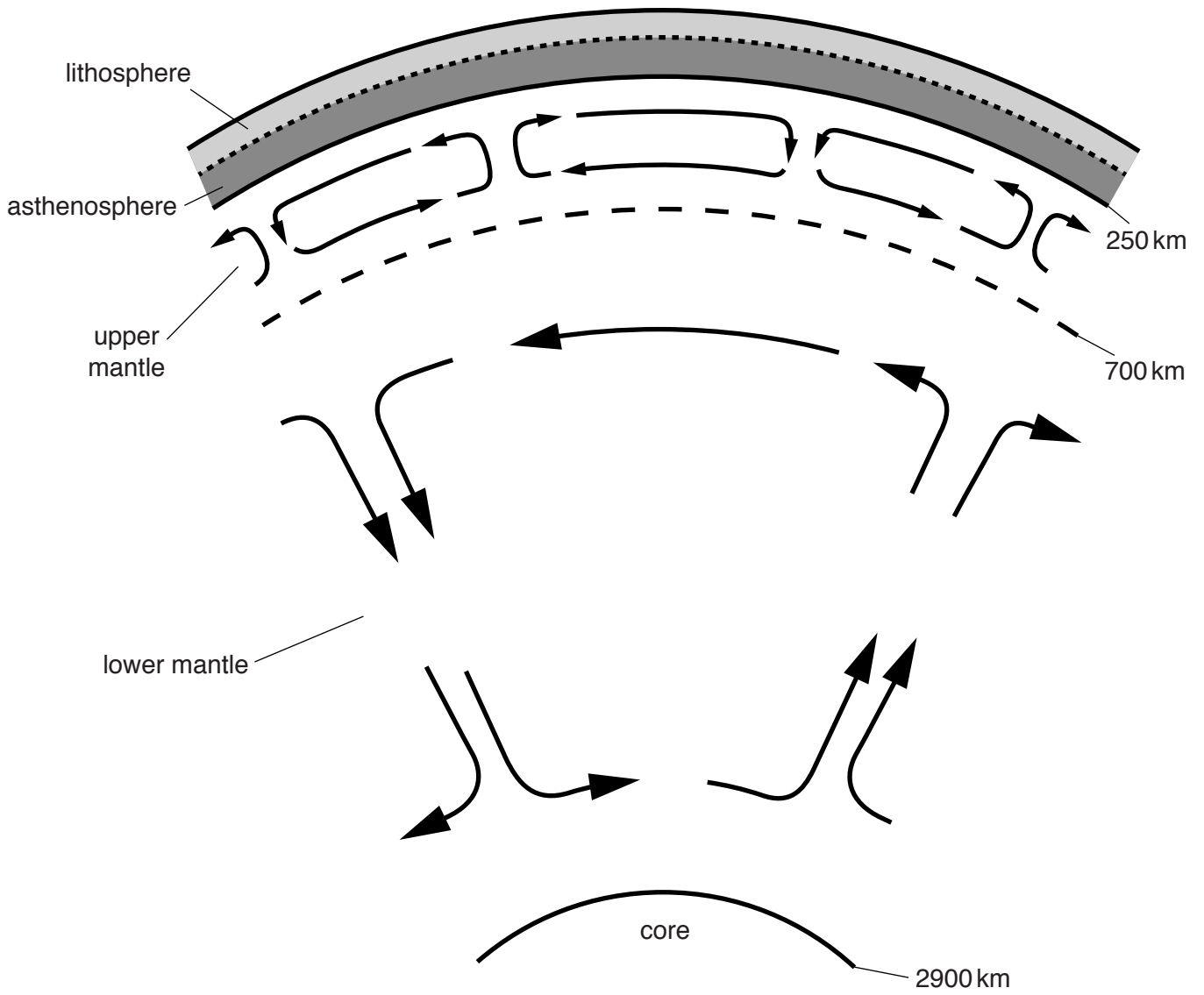
(ii) Describe and explain the pattern of earthquakes shown by the graph.

 [2]

(iii) Explain why there are no earthquake foci below 700 km.

 [1]

(d) The diagram below shows a possible model for mantle convection.



(i) Describe the possible role of the asthenosphere in mantle convection.

.....
.....
.....
..... [2]

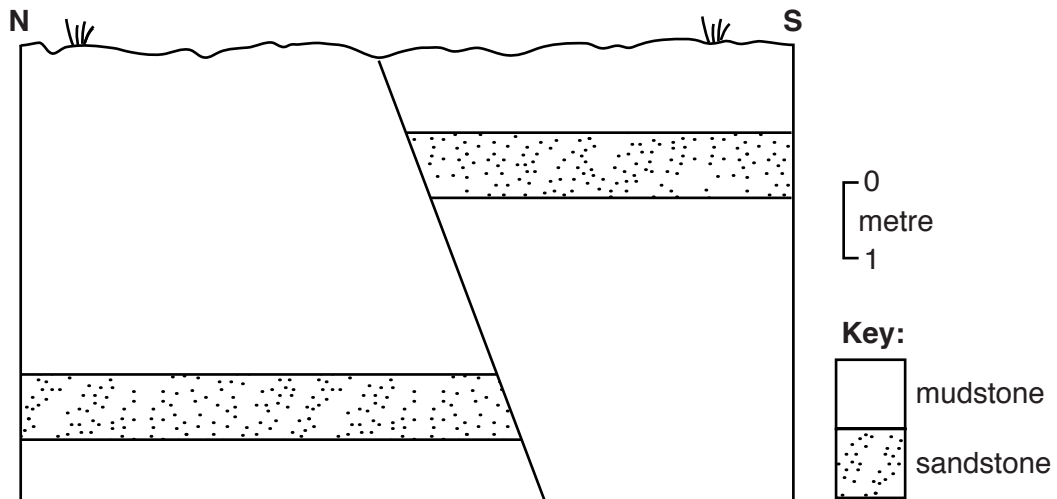
(ii) What evidence is there at the Earth's surface for mantle convection?

.....
.....
.....
..... [2]

[Total: 15]

Question 4 begins on page 10

4 (a) The cross-section below shows faulted beds in a cliff.



(i) With reference to the cross-section, complete the sentences below using the following words.

- | | | |
|--------------------|--------------------|---------------|
| compressive | extensional | normal |
| north | reverse | south |

You may use each word once, more than once or not all.

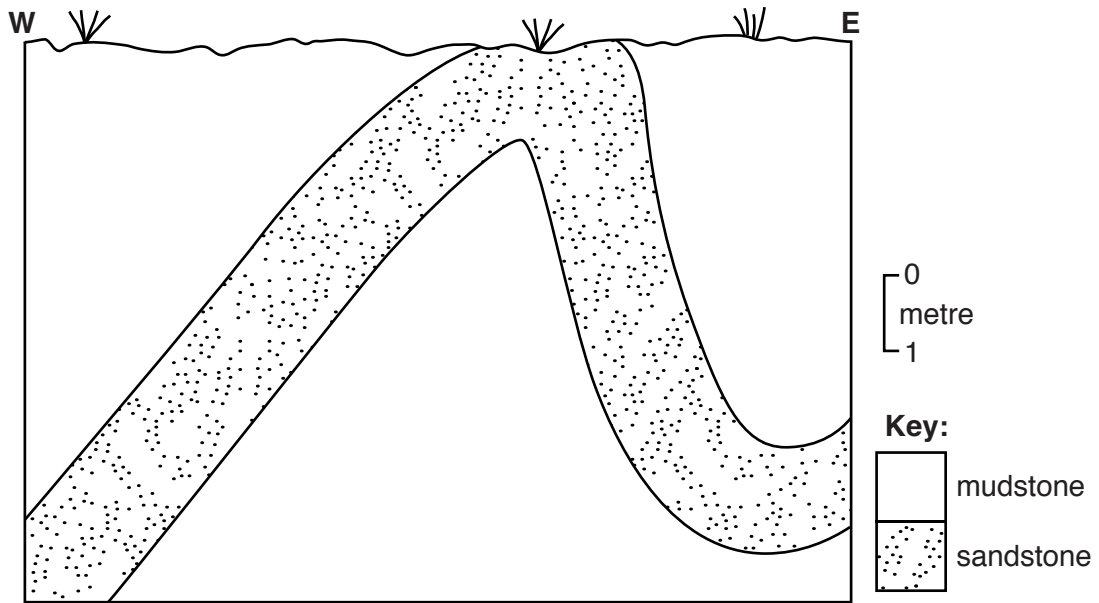
The cross-section above shows a fault with the hanging wall to the and the downthrown side to the

The fault is caused by stress. [3]

(ii) Measure the throw of the fault on the cross-section diagram.

Answer metres [1]

(b) The cross-section below shows folded beds in a cliff.



(i) Draw and label **two** axial planes on the cross-section. [1]

(ii) Name and fully describe the fold in the centre of the cross-section.



In your answer, you should use the appropriate technical terms, spelled correctly.

name

description

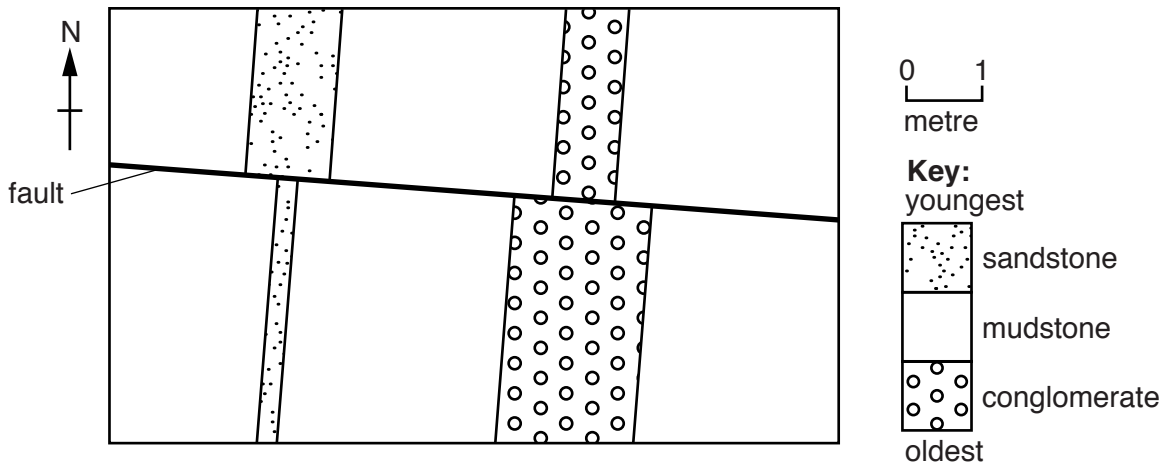
.....

[2]

(iii) State the direction of the greatest compressive force.

..... [1]

(c) The map below shows a series of folded sedimentary rocks that are the right way up.



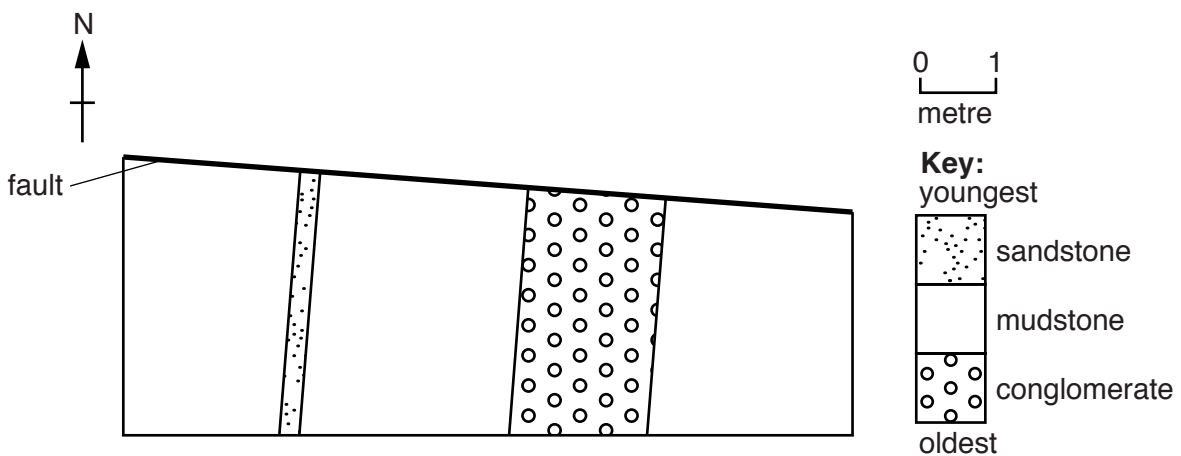
- (i) Draw the axial plane trace of a syncline on the map. [1]
- (ii) Draw dip arrows on the map to show an anticline. [1]
- (iii) Draw and shade an angular unconformity on the west side of the map that is younger than all the rocks and structures shown. [1]
- (iv) The fault is vertical and is downthrown to the north.

Describe the evidence on the map that supports this statement.

.....
 [1]

(d) The incomplete map below shows a vertical tear fault cutting through a series of folded sedimentary rocks that are the right way up.

Draw the beds north of the tear fault to complete the map.
 The movement of the tear fault is 1 m in a dextral direction.



[1]

[Total: 13]

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).

A large area of lined paper for writing. It features a vertical solid line on the left side, creating a margin. The rest of the page is filled with horizontal dotted lines, providing space for writing answers.

A large rectangular area with a solid vertical line on the left side and horizontal dotted lines extending across the page, providing a grid for writing answers.



Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.