

## SECTION B

Questions 5 - 8 relate to the **British Geological Survey 1:50,000 Geological Map extract of Alloa.**

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

This section should take approximately 1 hour to complete.

**5. With reference to the Geological Map:**

- (a) (i) At grid reference **904960**, give the following details of the bedding in the Carboniferous Middle Coal Measures ( $d^{c2}$ ): [3]

Dip angle	
Dip direction	
Strike orientation	—

- (ii) Describe the folding in the Carboniferous rocks within **Box A** on the map extract. [3]

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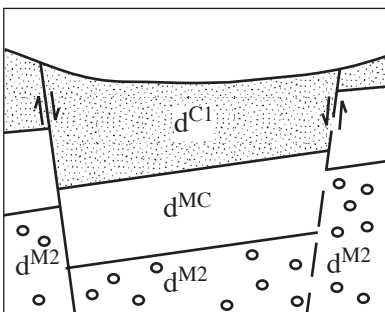
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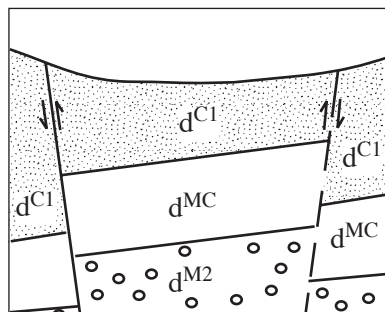
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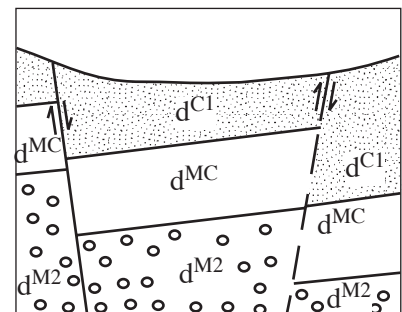
- (b) Refer to section line **C-D** on the map extract and the cross sections shown in **Figures 5a, 5b** and **5c**.



**Figure 5a**



**Figure 5b**



**Figure 5c**

State which of the cross sections corresponds with section line **C-D** on the map extract.  
Briefly explain your choice. [3]

Choice of cross section .....

Explanation .....

.....

.....

**Total 9 marks**

6. The Ochil fault separates Igneous from Carboniferous rocks on the map extract. The fault trends west to east between **R** and **Q** and shows only vertical movement.

- (a) (i) Measure the angle of dip of the Ochil Fault on the cross section. [1]

Angle of the Ochil Fault plane ..... degrees

- (ii) Suggest why the true angle of dip of the Ochil fault is less than the value you obtained in part (a) (i) above. [1]

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- (b) (i) In **grid square 8697**, state which side of the Ochil Fault has been downthrown. Give one piece of map evidence to support your answer. [2]

Downthrown side .....

Evidence .....

- (ii) Describe **one** piece of evidence you would look for in the field to prove the existence of the Ochil Fault. [2]

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- (iii) Name the type of fault of which the Ochil fault is an example. Give **one** reason to support your answer. [2]

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- (c) Using the **geological map** and cross section **X-Y**, complete the table to show which is the older in each of the following pairs of rock units and geological events: [3]

Deposition of rock unit  $d^{MC}$  and rock unit  $d^{C3}$

Formation of Igneous rock H and the Ochil Fault

Formation of Igneous rock  $Q^D$  and the Ochil Fault

Give **one** reason to justify your decision in each case.

Relative age of:	Older	Reason
Deposition of rock units $d^{MC}$ and $d^{C3}$		
Rock H and Ochil Fault		
Rock $Q^D$ and Ochil Fault		

**Total 11 marks**

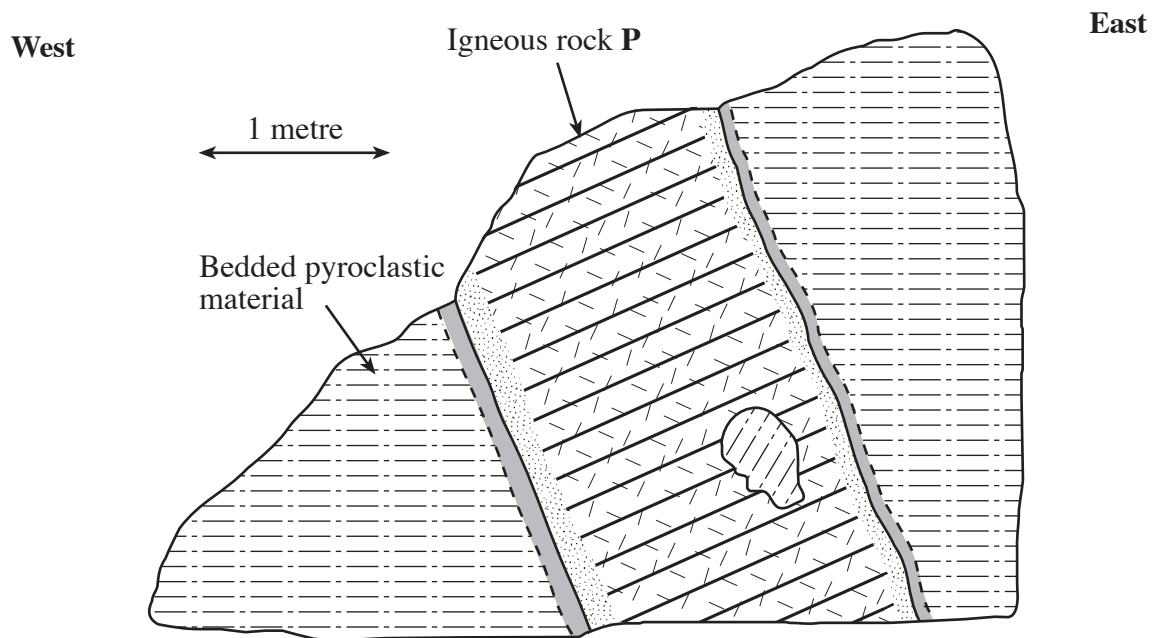
7. Study the igneous features labelled **H** and **P** immediately north of the Ochil Fault on **Figure 6** and the **map extract**.

- (a) (i) Identify the types of igneous intrusions formed by rocks **H** and **P**. [2]

**H** ..... **P** .....

- (ii) Account for the variation in the width of the metamorphic aureole around igneous intrusion **H**. Draw a simple cross section to explain your answer. [2]

- (b) **Figure 6** is a field sketch of one exposure of igneous rock **P** from the map. [3]  
Annotate the field sketch to show details of three additional important geological features.



**Figure 6**

**Total 7 marks**

8. (a) A new landfill site has been proposed for location within the area covered by the map extract. Evaluate the suitability of each of the potential quarry sites below, with reference to geological factors.

**Site F GR 852922** ..... [3]

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**Site G GR 890970** ..... [3]

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**Site E GR 930985** ..... [3]

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**Total 9 marks**

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