

SECTION B

Questions 5-7 relate to the **British Geological Survey 1:50 000 geological map extract of Bristol**

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

This section should take approximately 1 hour to complete.

5. (a) Using the key on the **Geological Map**, identify the feature represented by the symbol at the following grid references (**GR**). [2]

Grid reference (GR)	Feature
498649	•
494644	•

- (b) **Figure 5** shows a typical boundary between the base of the Triassic Dolomitic Conglomerate (**MMMMF** within the Triassic Mercia Mudstone Group) and the underlying strata in this area.



Source: British Geological Survey (P006750)

Figure 5



Draw and annotate a sketch of **Figure 5** in the space below to explain the formation and significance of this boundary. [5]

- (c) (i) With reference to the **Geological Map**, describe the outcrop pattern of the Dolomitic Conglomerate (**MMMMF**). [2]

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- (ii) The Dolomitic Conglomerate (**MMMMF**) was deposited by high-energy streams. Explain the evidence for this from **Figure 5**. [2]

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Total 11 marks



6. A student recorded dip arrow directions for the main outcrop of Carboniferous Limestone shown on the **Geological Map** as part of an investigation into the major fold structure. **Table 6** is a partly completed tally, and **Figure 6** a partly completed rose diagram, of these dip directions from the **Geological Map**.

Direction	N	NE	E	SE	S	SW	W	NW
Tally	### ### /	### //	///	###	### ### /	///	###	### //
Total number of dip arrows	•	•	•	5	11	3	5	7

Table 6

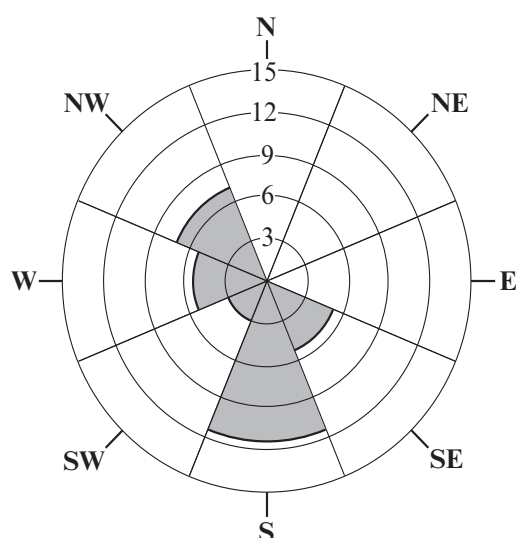


Figure 6

- (a) (i) The tally in **Table 6** does not include the directions of the 3 dip arrows in **grid square 5167**. Add these to the tally and complete the totals for the data set. [2]
- (ii) Complete the rose diagram (**Figure 6**) to show the total number of dip arrows for the completed data set in **Table 6**. [2]
- (b) In analysing the data the student concluded that the main outcrop of Carboniferous Limestone forms “an elongated, dome-shaped fold which plunges to the west and east”. (i) Evaluate this statement with reference to the **evidence** from the **Geological Map** and the rose diagram (**Figure 6**). [4]

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- (ii) State **two** limitations of the use of rose diagrams of dip angle directions to show the structure of folds. [2]

1.

2.

- (c) (i) Using the **Geological Map** and **cross-section**, describe the general characteristics of the Wrington Hill Fault that crops out at **GR 478642** by completing **Table 7** below. [4]

Fault characteristic	
Average dip angle	•
Strike direction	roughly E-W
Throw [as measured by vertical displacement of Portishead Formation (PoB)] (m)	• m
Downthrow side	south
Hanging wall side	•
Type of fault	•

Table 7

- (ii) The student further concluded that “*the major faults affecting the Carboniferous Limestone are largely compatible with the principal stress directions that formed the major fold structure*”. Evaluate this statement. [3]

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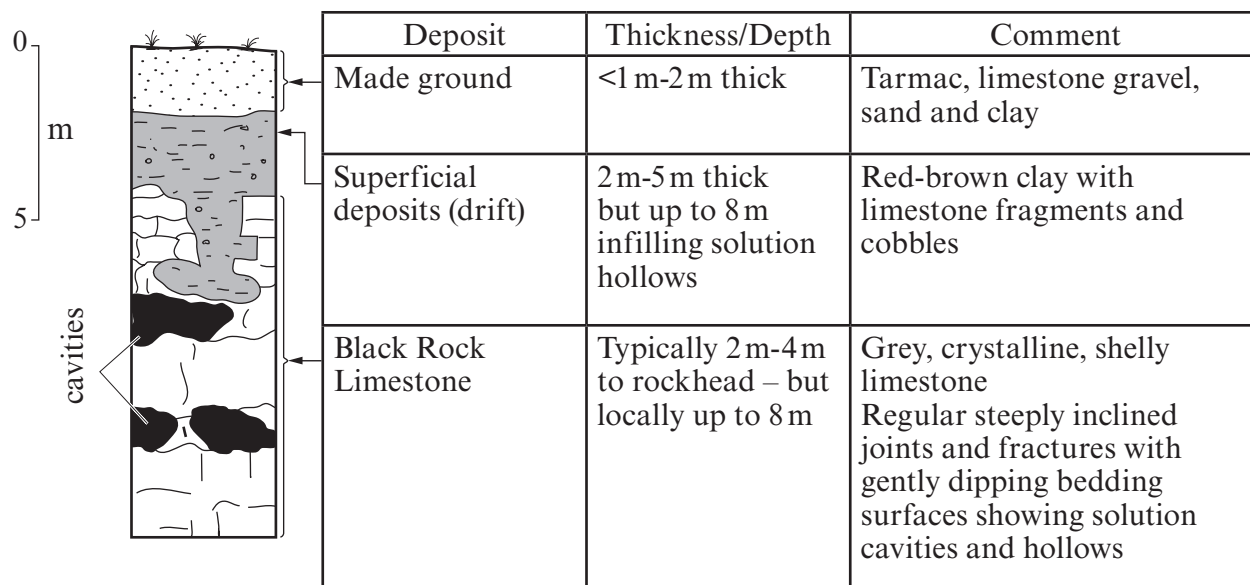
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Total 17 marks



7. Bristol Airport is situated in **grid square 5065**. **Figure 7** is a summary of typical ground conditions at Bristol Airport. Five disused landfill sites and a number of disused lead mines are located on or close to the site.



The Carboniferous Limestone is classified by the Environment Agency as “a major aquifer... able to support large water abstraction for public supply and other purposes from boreholes surrounding Broadfield Down. The regional groundwater flow from Broadfield Down follows the dip”.

Figure 7

- (a) With reference to **Figure 7**, explain why cavities and hollows typically form in limestone. [3]

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1.
2.

- You may consider why the engineering activities associated with this development (building of runways, taxiways, car parks, airport buildings, aviation fuel depot, etc.) needed to take account of any of the following:

- [7]



[illegible]

[illegible]

[illegible]