WJEC CBAC

GCE A level

1215/01

GEOLOGY – GL5

Thematic Unit 1
Quaternary Geology

P.M. TUESDAY, 10 June 2014

ONE of TWO units to be completed in 2 hours plus your additional time allowance

Surname _____

Other Names _____

Centre Number _____

Candidate Number 2 _____

	For Examiner's use only		
	Question	Maximum Mark	Mark Awarded
Section A	1.	15	
Section B	2.	25	
	3.		
	4.		
	Total	40	

ADDITIONAL MATERIALS

In addition to this and one other examination paper, you will need a calculator.

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball-point pen or your usual method.

Write your name, centre number and candidate number in the spaces on the front cover.

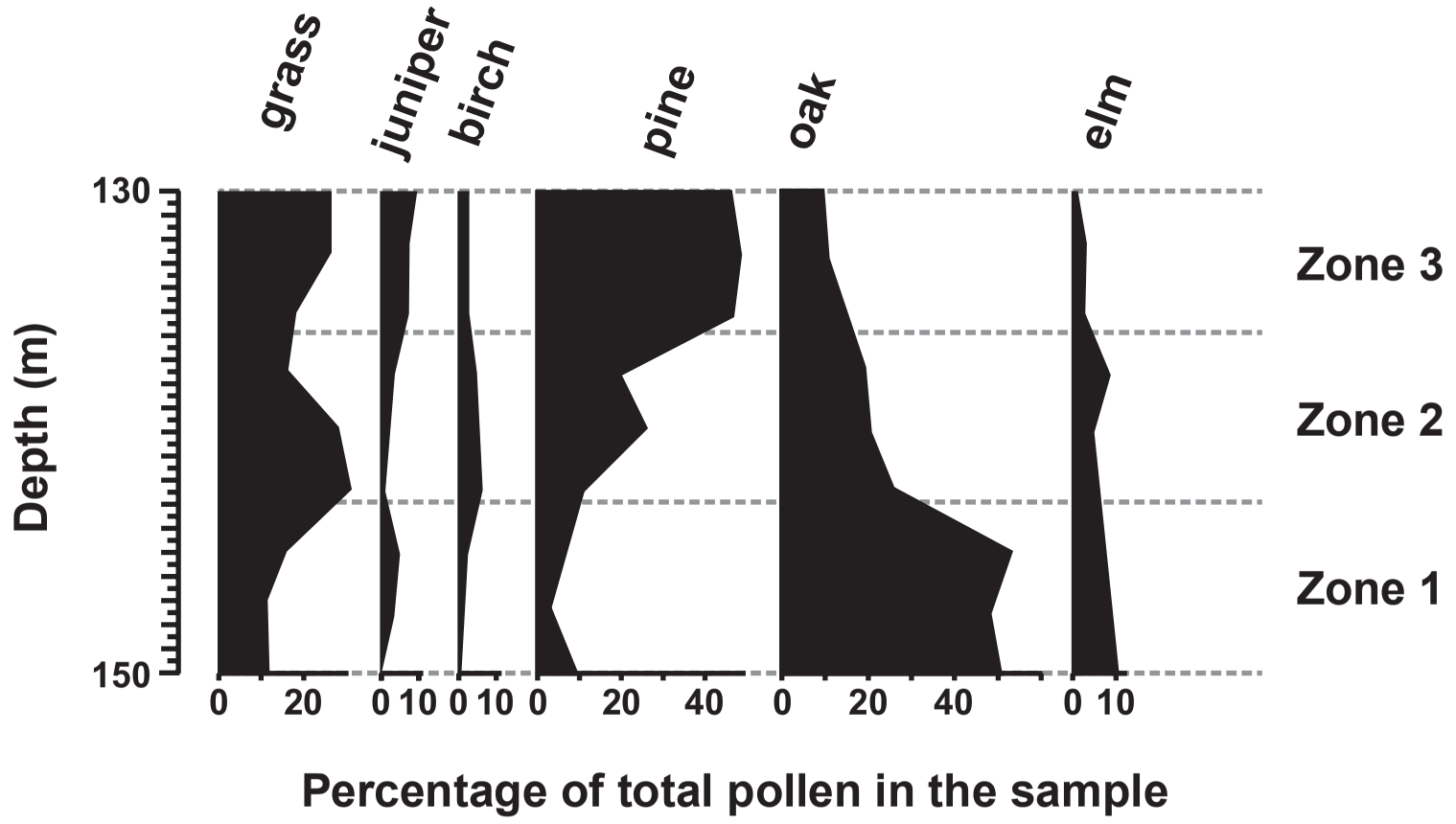
Answer QUESTION 1 in Section A (15 marks) and ONE question from Section B (25 marks).

INFORMATION FOR CANDIDATES

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

You are reminded of the necessity for good English and orderly presentation in your answers.

FIGURE 1a


grass
juniper
birch
pine
oak
elm
130
150
Depth (m)
Zone 3
Zone 2
Zone 1
0
20
0 10
0 10
0
20
40
0
20
40
0 10
Percentage of total pollen in the sample

SECTION A

1 FIGURE 1a opposite shows the changes in abundance of pollen in a sediment core in Britain.

TABLE 1 shows the environmental conditions of the plants which produced the pollen.

Pollen name	Plant characteristics and favoured environment
grass	widespread
juniper	evergreen conifer, tree or shrub, needle shaped leaves; drought and cold tolerant
birch	deciduous, broad leaved tree or shrub; cool temperate and cold tolerant
pine	evergreen, conifer tree, needle shaped leaves; cold tolerant
oak	deciduous or evergreen tree, broad leaved; temperate
elm	deciduous broad leaved tree; temperate

TABLE 1

FIGURES 1b, 1c and 1d show data from ice cores providing evidence of atmospheric changes over the past 150,000 years.

FIGURE 1b shows the oxygen isotope values from an ice core.
FIGURE 1c shows the temperature changes inferred from isotope data in an ice core.
FIGURE 1d shows the CO_2 values from an ice core.

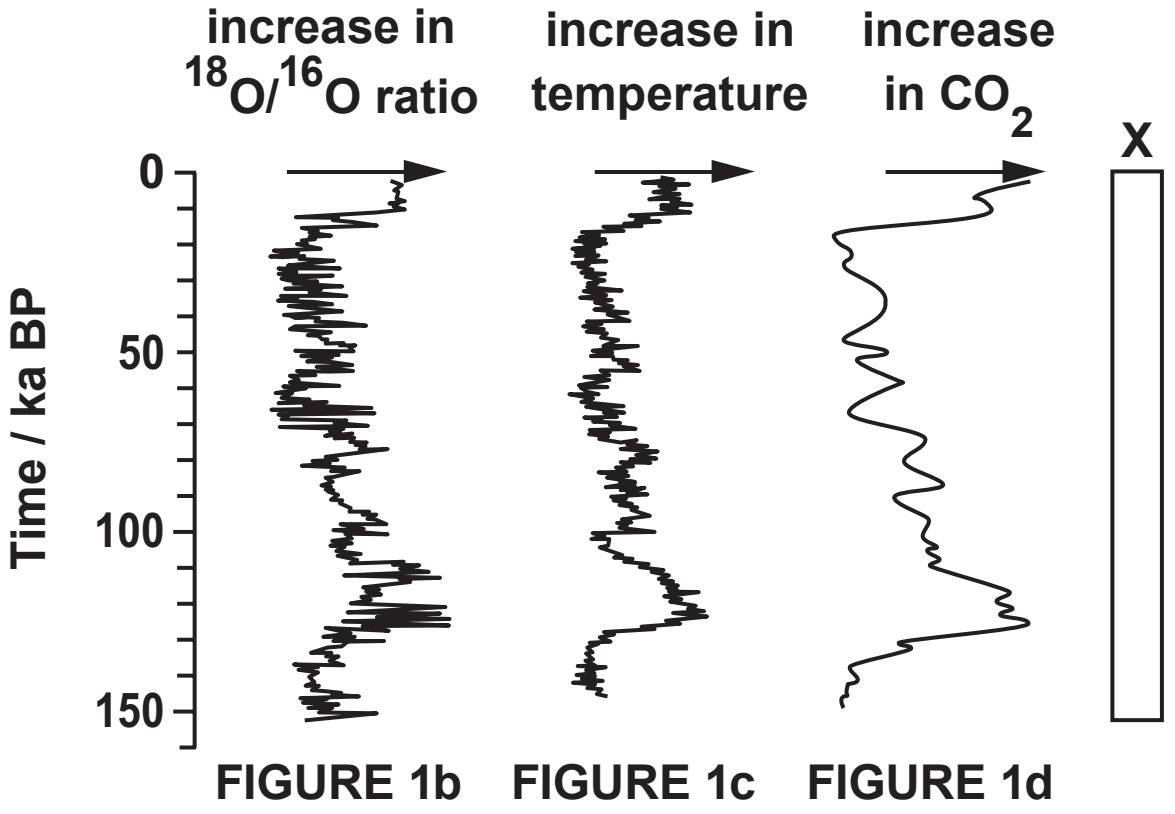


FIGURE 1b FIGURE 1c FIGURE 1d

Refer to FIGURES 1b, 1c and 1d.

1(a) (i) In the box labelled X, shade in the area representing the extent of the last glacial episode (start to the end). [2]

(ii) Describe the relationship between the oxygen isotope data ($^{18}O/^{16}O$ ratio) in FIGURE 1b and the inferred temperature values in FIGURE 1c. [1]

_____

_____

_____

1(b) (i) Use the information in FIGURE 1a and TABLE 1 to describe the general vegetation type and suggest the climate in Zones 1 and 3. [6]

Zone 1

VEGETATION TYPE

CLIMATE

Zone 3

VEGETATION TYPE

CLIMATE

1(b) (ii) **Describe the global climate change indicated by the changes in pollen in FIGURE 1a. [1]**

(iii) **Describe how FIGURES 1b and 1c indicate that short term cyclic changes were superimposed on the dominant pattern of glacial and interglacial stages. [1]**

(iv) **With reference to FIGURES 1b, 1c and 1d and your knowledge, evaluate the following statement. 'Climatic fluctuations in the last 150,000 years were caused by changes in the concentration of CO_2 in the atmosphere.' [4]**

15

SECTION B

Answer ONE question only.

Write your answer in the remaining pages of this booklet.

2(a) **Using a named modern sedimentary environment, describe the characteristics of that environment and link them to the processes which form them. You may refer to any of the following:**

- **lithologies**
- **sedimentary structures**
- **organic forms**
- **bed shapes and field relationships**

(b) **Evaluate how the link between product and process can be used to reconstruct earlier environments recorded in sedimentary rock sequences. [25]**

3(a) **Describe the evidence from Quaternary DEPOSITS for the following sedimentary environments in Britain:**

- **periglacial**
- **glacial**

(b) **Evaluate the reliability of any interpretation of ice sheet dimensions from this evidence. [25]**

4(a) **With reference to examples, describe and explain how geological structure and lithology can control:**

- **river drainage patterns**
- **underground river courses**
- **groundwater flow**

(b) **'In some areas drainage is only partly controlled by geological structure and lithology.' Evaluate this statement. [25]**

END OF PAPER