X208/701

NATIONAL QUALIFICATIONS 2009

WEDNESDAY, 27 MAY
9.00 AM – 11.30 AM

GEOGRAPHY
ADVANCED HIGHER

1. Candidates are expected to attempt **three** questions, **one** from Section A and **one** from Section B, **and** the question in Section C.

2. Both questions in Section A are worth 30 marks each and both questions in Section B 20 marks each. The question in Section C is worth 10 marks.

3. In all questions, marks will be given for sketch-maps and diagrams which are integral parts of an answer.

4 Candidates are encouraged to use the Supplementary Items and tracing paper provided for annotation or as bases for diagrams. If used, the resources should be placed inside the front cover of the candidate's answer book.

5 Candidates are reminded that they have an atlas which can be a valuable resource in answering questions in all parts of the paper.

SECTION A

Answer ONE question ONLY from this Section

Map Interpretation

Supplementary Item A, Ordnance Survey Map, Extract No 1746/EXP189 1:25 000 (Explorer Series) Hereford and the Wye Valley, is the basis for answers to questions in this Section.

For whichever question you choose in this Section (ie 1. or 2.) you are expected to make <u>extensive and detailed use</u> of your atlas and the map extract.

You are strongly advised to read the whole of both question 1 and question 2 before you make your choice.

Marks

1. *Flood risk management includes the use of flood defences, where appropriate, but also recognises that more 'managed flooding' is essential to meeting goals for biodiversity and to sustain good ecological status in river systems.*

Flood management using "hard engineering" can be very expensive. Hereford is currently undertaking such a multi-million pound flood defence scheme of walls and embankments to protect its fine historic buildings and main roads. However, in rural areas this is not cost effective and "soft engineering" is more appropriate.

One project being considered for the Wye Valley is to allow parts of the flood plain to return to their natural state. The first stage is to allow ponds and marshes to form. These will

- act as "sponges" to reduce flooding downstream, and
- create a Nature Reserve in the process.

A Visitor Centre with viewing areas and car park will be required as part of the overall project.

(*a*) (i) Choose an area of approximately one square kilometre (you do not have to use straight edges) which you consider could be allowed to flood to create a landscape of ponds and marshes. This will attract birds and become the first stage in the development of the Nature Reserve.

Mark your area on the tracing overlay (*Supplementary Item B*).

(ii) On the same tracing overlay, draw your chosen site for the Visitor Centre and car park. The site should be 100 × 50 metres and drawn to scale. **4**

(*b*) Explain fully, using direct map evidence, the reasons for your choice of sites for both the Nature Reserve and the Visitor Centre. **12**

(*c*) Discuss, using direct map evidence, the benefits of this project to the tourist industry in the whole area of the map extract. **8**

(*d*) The Nature Reserve is likely to attract bird watchers who may want to study an even greater variety of birds in different habitats.

(i) Choose **two** non wetland areas of different landscapes/habitats which bird watchers could visit while in this area. Mark them with numbers 1 and 2 on the same tracing overlay (*Supplementary Item B*).

(ii) Explain why **each** is suitable using direct map evidence to support your answer. **6**

(30)

Marks

2. Maps produced on the Environment Agency's website show that possible flood levels in the area of the map extract could reach the 50 metre contour.

(*a*) On the tracing overlay (*Supplementary Item C*), carefully complete the 50 metre contour to show the extent of possible flooding as predicted above. **4**

(*b*) Choose six **different** examples of land uses which could be affected by such a flood. Number them (1–6) and give a correct point reference (6–figure GR) **on the same tracing overlay** (*Supplementary Item C*). **6**

(*c*) Explain the **impact** of the flooding for **each** of the land uses identified in (*b*). You should consider the immediate area and also, where appropriate, the downstream areas. You should use clear map evidence and Grid References to back up your answer. **20**

(30)

SECTION B

Answer ONE question ONLY from this Section

For whichever question you choose in this Section (ie 3. or 4.) you are encouraged to make use of your atlas.

You are strongly advised to read the whole of both question 3 and question 4 before you make your choice.

3. Study the information given in *Supplementary Items D* and *E*.

A Spearman Rank Correlation has been applied to the data in *Supplementary Item E*.

(*a*) State the null hypothesis. **1**

(*b*) Complete the table on *Supplementary Item E* and calculate the Spearman Rank Correlation Coefficient (r) for the data sets for:

(i) water pumped from mean sea level aquifer in millions m^3/year;

(ii) salinity of water (parts per million). **4**

(*c*) State the result in terms of the null hypothesis. **1**

(*d*) Comment on the suitability of using this technique for measuring the correlation between the two variables in the data set. **5**

(*e*) With reference to the "r" result and *Supplementary Item D*, discuss the way in which continuing extraction trends are likely to impact environmentally, socially and economically on Malta. **9**

(20)

[Turn over for Question 4

Marks

4. A questionnaire is a technique widely used to collect primary data in geography.

(*a*) (i) What are the advantages and disadvantages of using questionnaires to collect information?

(ii) Describe **three** types of geographical studies, other than a shopping survey, in which a questionnaire could be used as a means of collecting data. **6**

Shopping Questionnaire

Introduction: "Excuse me. I wonder if I could ask you some questions?

1. What is your name?
2. What age are you?
3. Where do you live?
4. How do you get here?
5. Do you come here often?
6. How long is your normal journey?
7. Do you buy high or low order goods?
8. Is this a good shopping centre and, if so, why?
9. Where else do you go shopping?
10. Do you shop there because it is cheaper or nearer your house?

Right, that's it then."

(*b*) The example of a questionnaire above could be used to gather information for a shopping survey.

(i) Discuss what the student should take into account when devising a survey of this kind.

(ii) Describe what is wrong with the questionnaire above and suggest possible improvements which could be made to the questionnaire. **8**

4. (continued)

How often do you come shopping?

More than once a week	30
Weekly	15
Occasionally	5

How do you travel?

Walk	3
Car	26
Bus	20
Train	1

Why do you come here rather than any other shopping centre?

Nearer to home	12
Nearer to work	10
Choice	20
Environment	6
Other	2

Age

Under 20	7
20–30	10
30–60	19
Over 60	14

Where do you live?

Earswick	6
West Huntington	8
Nunthorpe	4
Murton	10
Skelton	14
Knapton	5
Deighton	3

(*c*) Discuss the techniques that the student could use to analyse and process the questionnaire results above.

The techniques discussed **must** include both graphical and statistical methods. **6**

(20)

[Turn over for SECTION C on *Page six*

SECTION C

This question must be answered

Marks

5. A group of Geography students was asked to record variations in noise levels (from CBD to the edge of town) in a medium sized town, along a transect X–X_1, shown in Fig I.

Fig I Transect from CBD to Urban Periphery

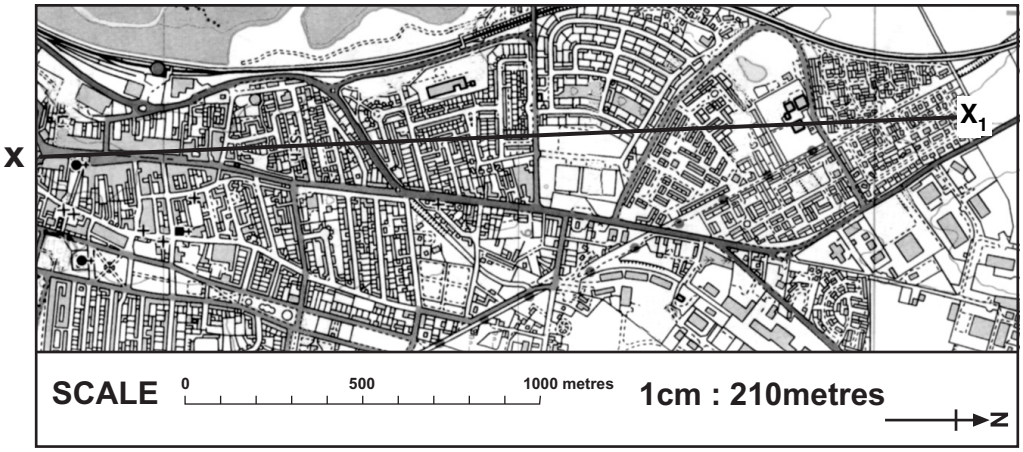
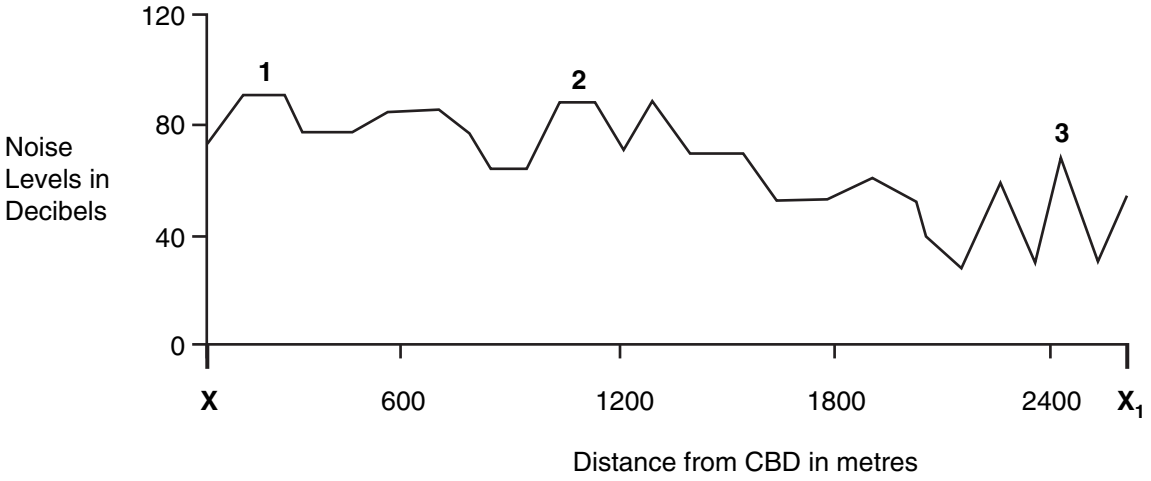


Fig II Variations in Noise Levels from CBD to Urban Periphery (Saturday, August 2, 13 00–15 00 hours)



The information above shows the level of noise recorded by the students as they moved from the CBD towards the edge of town.

(*a*) State an appropriate working hypothesis for such a study. **1**

(*b*) (i) Discuss how the students would have gathered the data shown in the graph (Fig II).

(ii) What additional information would need to be gathered to allow an explanation of the pattern shown in the transect? **5**

(*c*) Comment on the possible causes of noise levels at **1** and **2** and suggest why such wide variations in decibel levels were recorded at **3**. **4**

(10)

[*END OF QUESTION PAPER*]

[BLANK PAGE]

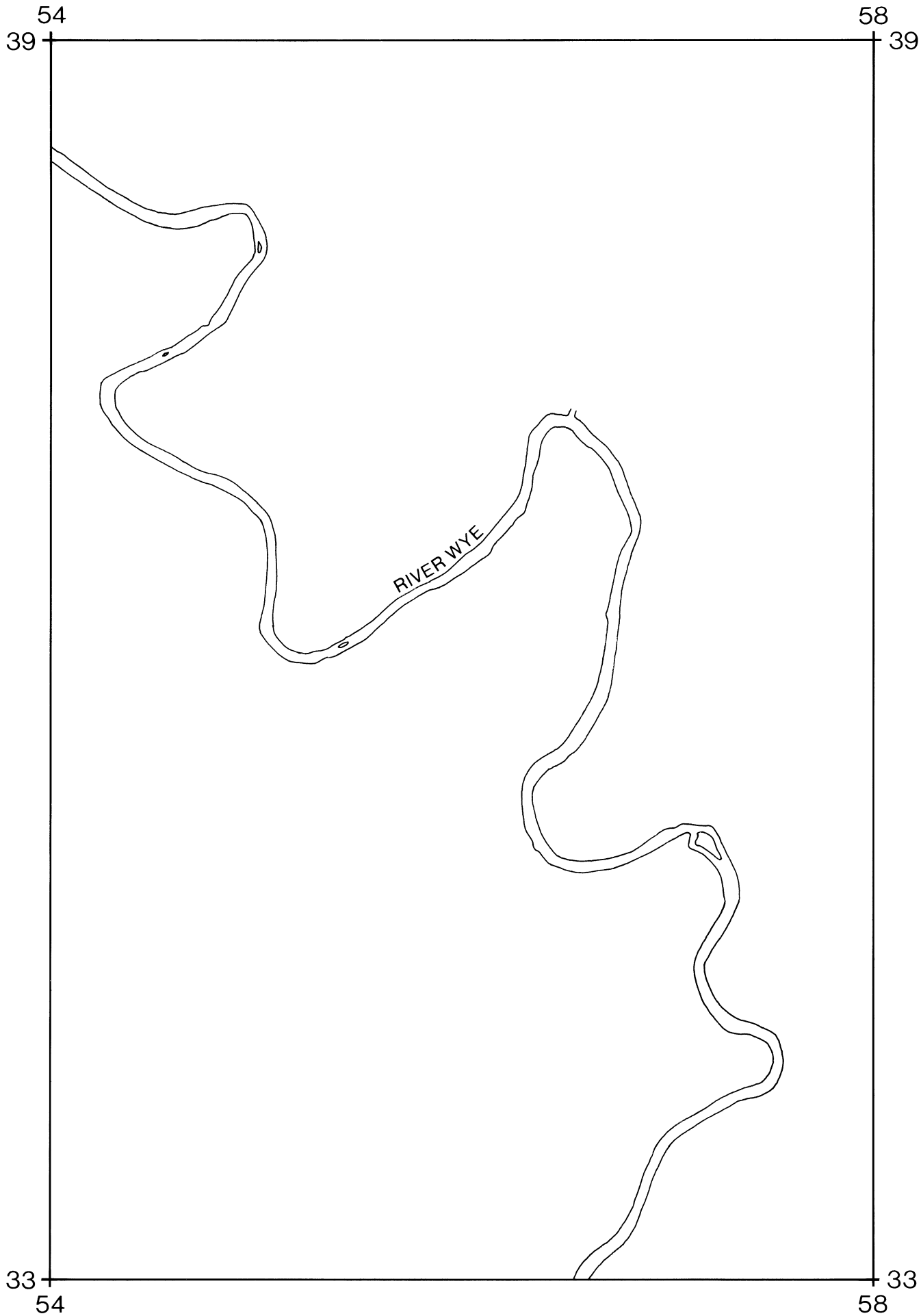
[BLANK PAGE]

X208/703

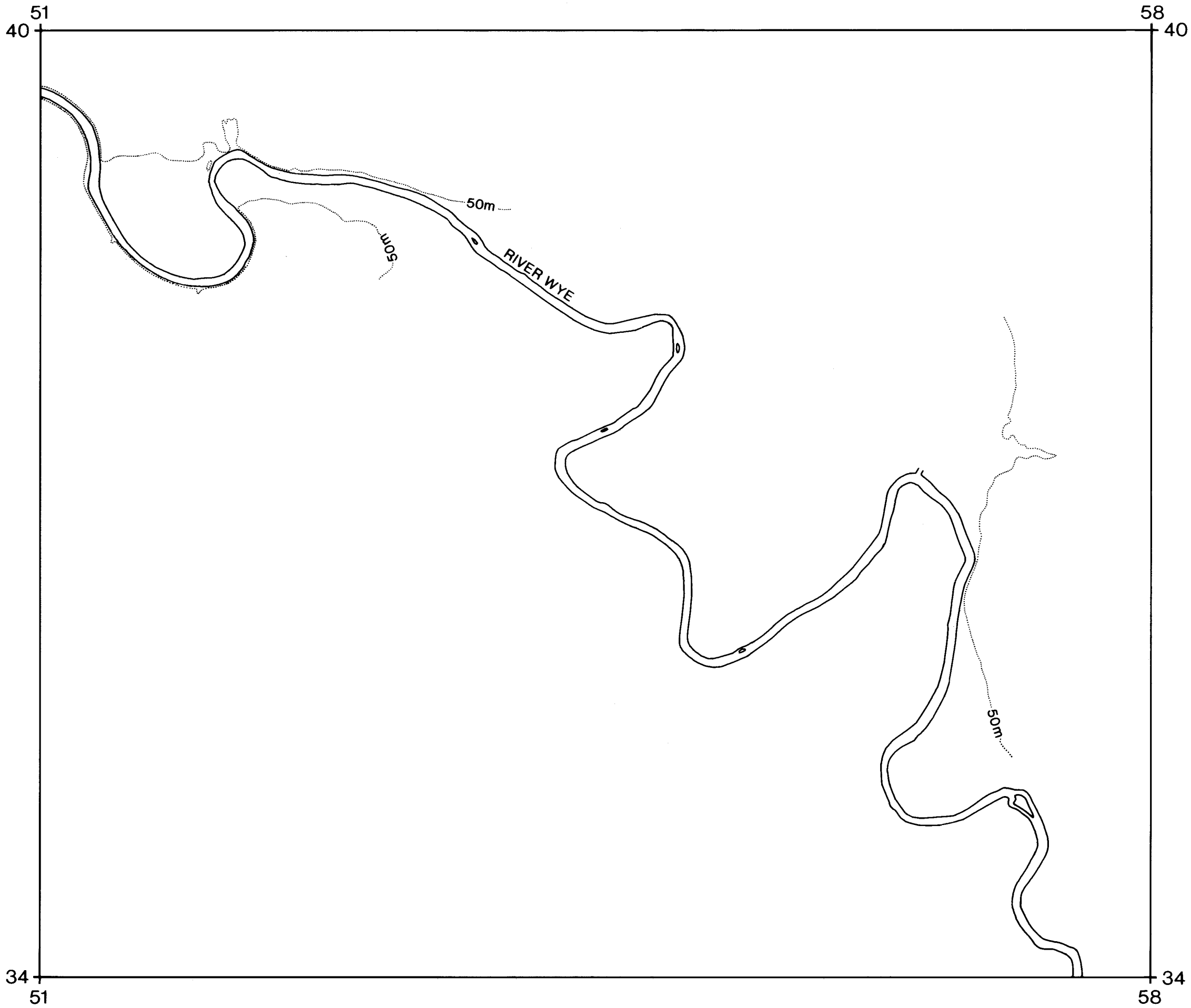
Full name of centre .....

SUPPLEMENTARY ITEM B

Name of candidate ..... Date of birth .....



Full name of centre ..... Name of candidate ..... Date of birth .....



SUPP. ITEM D

X208/705

NATIONAL QUALIFICATIONS 2009

WEDNESDAY, 27 MAY
9.00 AM – 11.30 AM

GEOGRAPHY
ADVANCED HIGHER
SECTION B
Supplementary Item D
for Q3

Fill in these boxes

Full name of centre

Town

Forename(s)

Surname

Date of birth

Day		Month		Year	

If annotated by the candidate, to be placed inside the front cover of the candidate's book and thus sent to the Scottish Qualifications Authority.

SUPPLEMENTARY ITEM D

The Maltese archipelago is located in the central part of the Mediterranean Sea about 90 km south of Sicily (Italy). It consists of 3 main islands: Malta, Gozo and Comino. The total area is 316 km^2. Average annual rainfall is 524 mm and total surface water resources estimated at 0·5 million m^3/year. At present, 32·4 million m^3/year of desalinated water is produced from four sea water Reverse Osmosis* Plants necessary for the provision of drinkable water. Tourism accounts for 30·3% of the country's GDP. Some 3% of the workforce is employed in agriculture, yet there has been a 50% reduction since 1955 in agricultural land as a result of urban sprawl, dying agricultural practices and an ageing farming population. Potatoes, onions, melons, peaches and other stone fruits are major agricultural exports. Irrigation is responsible for increasing yields, and water use for agriculture is increasing. Of the total re-used, treated wastewater (1·56 million m^3/year), 1·22 million m^3/year (90%) was re-used in agriculture.

*Reverse Osmosis—the passage of, in this case, salt water through limestone and a semi-permeable membrane from a more to a less concentrated solution, ie from marine salt water to almost fresh water.

Malta, Selected Economic and Social Overview

Year	Population	No of tourist arrivals	Agricultural Production in metric tonnes/ha			Area of Agricultural land (ha)	Area of irrigated land (ha)
			Cereals	Roots	Pulses		
1980	324 000	811 609	3	11	2	12 167	693 (5·7%)
1985	345 335	1 096 826	4	7	3	11 031	691 (6·1%)
1990	359 412	1 144 556	4	12	3	9878	586 (5·9%)
1995	366 767	1 180 145	3	22	3	9988	664 (6·7%)
2000	391 670	1 265 050	3	26	3	10 738	723 (6·7%)
2005	401 880	1 171 343	4	22	4	10 148	873 (8·6%)

CEREALS: include wheat, rye, barley

ROOT CROPS: include potatoes, carrots

PULSES: include peas, beans, lentils

SUPP. ITEM E

X208/706

NATIONAL QUALIFICATIONS 2009

WEDNESDAY, 27 MAY
9.00 AM – 11.30 AM

GEOGRAPHY
ADVANCED HIGHER
SECTION B
Supplementary Item E
for Q3

Fill in these boxes

Full name of centre

Town

Forename(s)

Surname

Date of birth

Day		Month		Year	

If annotated by the candidate, to be placed inside the front cover of the candidate's book and thus sent to the Scottish Qualifications Authority.

SUPPLEMENTARY ITEM E

Table 1 Water pumped from Mean Sea Level Aquifer in millions of m^3 and Salinity of Water (parts per million)

Year	Pumped Water (millions m^3)	Water Salinity (parts per million)	RANK Pumped water	RANK Water salinity	Difference d	Difference d^2
1980	19·05	635	14	9	5	25
1982	21·30	587	13	13	0	0
1984	27·47	602	9	11	–2	4
1986	22·90	416	12	14	–2	4
1988	25·16	589	11	12	–1	1
1990	26·80	620	10	10	0	0
1992	27·94	647	8	7	1	1
1994	28·71	638	7	8	–1	1
1996	30·11	692				
1998	29·80	674				
2000	31·28	696				
2002	30·81	687				
2004	31·67	701				
2006	32·43	719				
						$\Sigma =$

Table 2 Critical Values given for Significance Level

N (no of values)	Significance Level	Significance Level
	95%	99%
14	0·545	0·716

Formula

$$Rs = 1 - \frac{6\Sigma d^2}{n(n^2 - 1)}$$