

Please check the examination details below before entering your candidate information	
Candidate surname	Other names
Centre Number	Candidate Number
Pearson Edexcel Level 3 GCE	
Wednesday 17 May 2023	
Morning (Time: 2 hours 15 minutes)	Paper reference 9GE0/01
Geography Advanced PAPER 1	
You must have: Resource Booklet (enclosed) Calculator, ruler	Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions in Section **A**, and Section **C**.
- Answer **either** Question 2 **or** Question 3 in Section **B**.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 105.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ►

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SECTION A**Tectonic Processes and Hazards**

Answer ALL questions in this section. Write your answers in the spaces provided.

You must use the Resource Booklet provided.

1 Study Figure 1 below.

The data was collected to investigate whether there was a significant relationship between the population living within 5km of a volcanic location and the years since the last eruption, at 10 selected locations.

Volcanic location	Population within 5km, in millions	Rank	Years since last eruption	Rank	d	d ²
Michoacán-Guanajuato	5.8	1	70	8	-7	49
Tatun Volcanic Group	5.1	2	1374	1	1	1
Campi Flegrei	2.2	3	484	4	-1	1
Ilopango	2.0	4	142	5	-1	1
Hainan Volcanic Field	1.7	5	89	7	-2	4
San Pablo Volcanic Field	1.3	6.5	672	2	4.5	20.25
Ghegham Volcanic Ridge	1.3	6.5	122	6	0.5	0.25
Dieng Volcanic Complex	1.1	8	1	9.5	-1.5	2.25
Auckland Volcanic Field	1.0	9.5	576	3	6.5	42.25
Masaya	1.0	9.5	1	9.5	0	0
						Σd^2

Figure 1

The population living within 5km of a volcanic location and the years since the last eruption, at 10 selected locations.



- (a) (i) Calculate Σd^2 .

(1)

$$\Sigma d^2 = \dots\dots\dots$$

- (ii) The formula for Spearman's rank correlation coefficient value r_s is given below.

In this data set $n = 10$.

$$r_s = 1 - \frac{6 \Sigma d^2}{n^3 - n}$$

Calculate the value of r_s , to two decimal places, for the data given.

You must show your working.

(2)

$$r_s = \dots\dots\dots$$

- (iii) The tables below show the two hypotheses that are being tested and the critical values of Spearman's rank r_s when $n = 10$.

Null Hypothesis: There is no significant relationship between the number of people living within 5km of a volcanic location and the years since the last eruption.

Alternative Hypothesis: There is a significant relationship between the number of people living within 5km of a volcanic location and the years since the last eruption.

Confidence level	0.10 (90%)	0.05 (95%)	0.01 (99%)
Critical value	0.44	0.56	0.73

Using the Spearman's rank correlation r_s value calculated in (a)(ii), state which hypothesis can be accepted.

(1)



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(b) Assess the effectiveness of strategies used to manage the impacts of volcanic hazards.

(12)



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TOTAL FOR SECTION A = 16 MARKS





Study Figure 2b in the Resource Booklet.

(b) Explain the role of feedback in changing the size of ice sheets and sea ice.

(6)

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(c) Explain the role of melting and refreezing cycles in forming distinctive periglacial landforms.

(8)

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(d) Evaluate the view that the management of active and relict glaciated landscapes is likely to be unsuccessful.

(20)

Handwriting practice lines for the answer.



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(Total for Question 2 = 40 marks)



Do not answer Question 3 if you have answered Question 2.

Indicate which question you are answering by marking a cross in the box ☒. If you change your mind, put a line through the box ☒ and then indicate your new question with a cross ☒.

If you answer Question 3, put a cross in the box ☒ .

Coastal Landscapes and Change

You must use the Resource Booklet provided.

3 Study Figure 3a in the Resource Booklet.

(a) Explain the contribution of erosional processes in producing sediment.

(6)

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[illegible]

(c) Explain the role of geology in the formation of contrasting cliff profiles.

(8)

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(d) Evaluate the view that without hard engineering there is little future for coastal communities threatened by coastal recession and flooding.

(20)



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(Total for Question 3 = 40 marks)

TOTAL FOR SECTION B = 40 MARKS



SECTION C**Physical Systems and Sustainability**

Answer ALL questions in this section. Write your answers in the spaces provided.

You must use the Resource Booklet provided.

4 Study Figure 4a in the Resource Booklet.

- (a) Explain **one** possible impact on local communities of the development of onshore wind farms.

(3)

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- (b) Explain how adaptation strategies, such as water conservation, may help communities cope with a changed climate.

(6)

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(c) Explain how water insecurity can cause both social and economic problems.

(8)

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- (d) Study Figure 4b and 4c in the Resource Booklet, which show two neighbouring upland river catchments and their hydrographs following a local storm event.

Assess the extent to which land use affects the shape of these storm hydrographs.

(12)



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- (e) The processes of the carbon cycle operate at longer and slower (geological) and shorter and faster (biological) timescales.

Evaluate the view that human activities are having a greater impact on shorter term biological processes than on longer term geological processes.

(20)



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TOTAL FOR SECTION C = 49 MARKS
TOTAL FOR PAPER = 105 MARKS



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Pearson Edexcel Level 3 GCE

Wednesday 17 May 2023

Morning (Time: 2 hours 15 minutes)

**Paper
reference**

9GE0/01

Geography

**Advanced
PAPER 1**

Resource Booklet

Do not return this Booklet with the question paper.

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SECTION B

The following resources relate to Question 2.

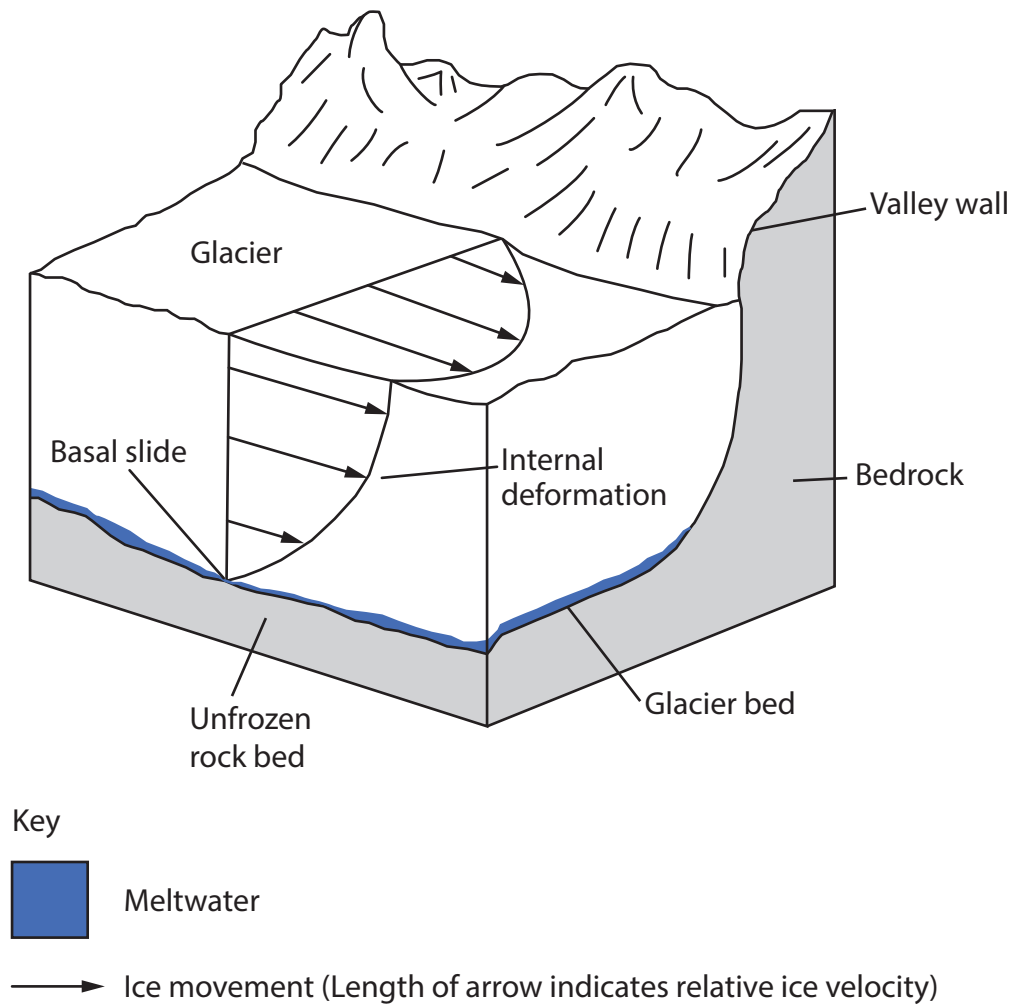


Figure 2a

Distribution of velocity in a temperate glacier

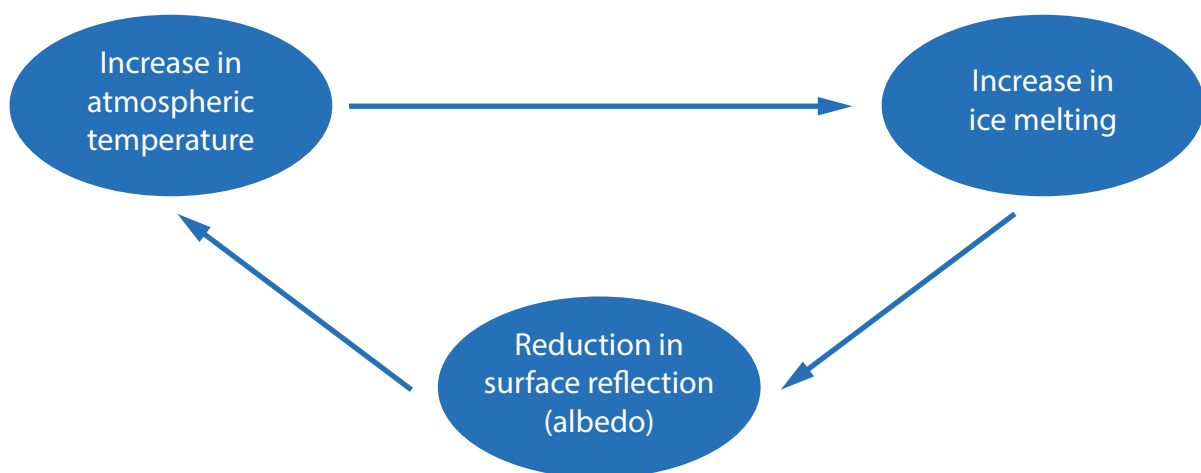
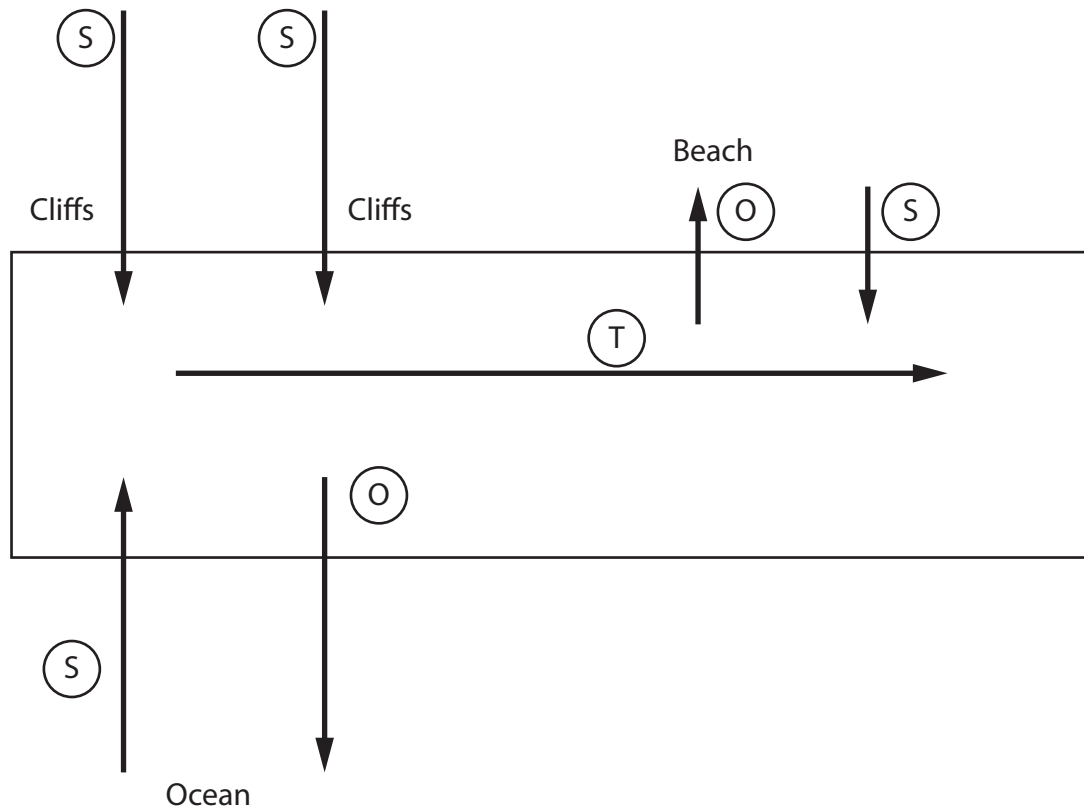


Figure 2b

Impact of increases in atmospheric temperature on the size of ice sheets and sea ice

The following resources relate to Question 3.



Key

- (S) Sources of sediment to the cell
- (T) Transfers of sediment within the cell
- (O) Outputs of sediment from the cell

Figure 3a

A coastal sediment cell showing sources, transfers and outputs

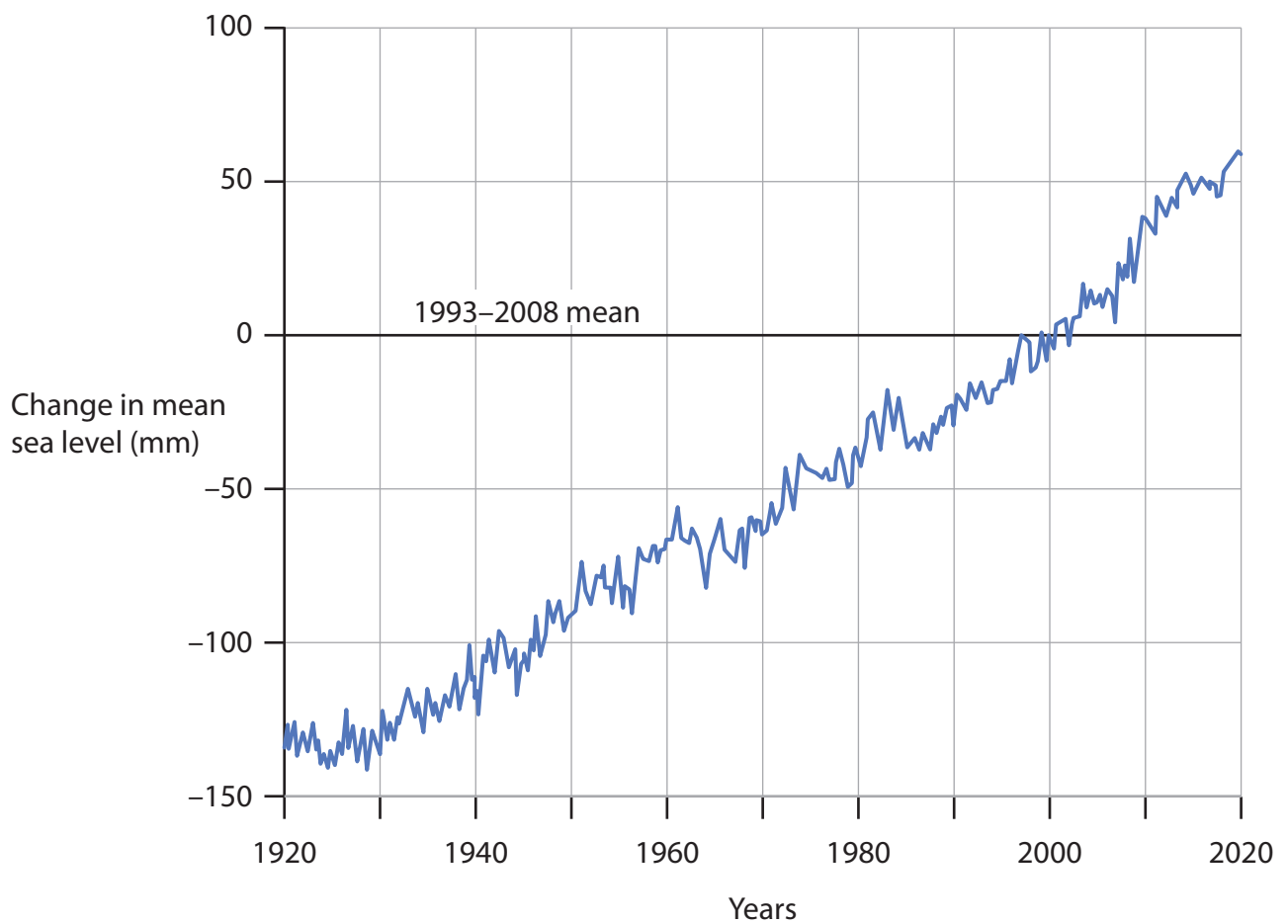


Figure 3b

Mean sea level, 1920–2020, compared to 1993–2008 mean

SECTION C

The following resources relate to Question 4.



Figure 4a

An onshore wind farm

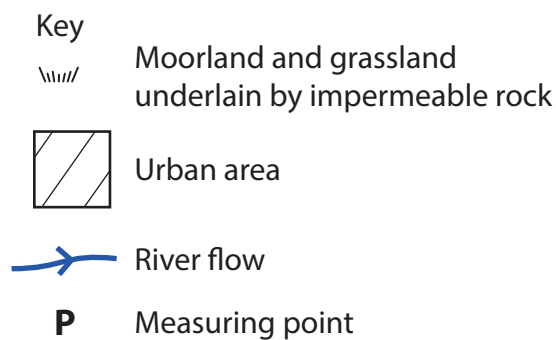
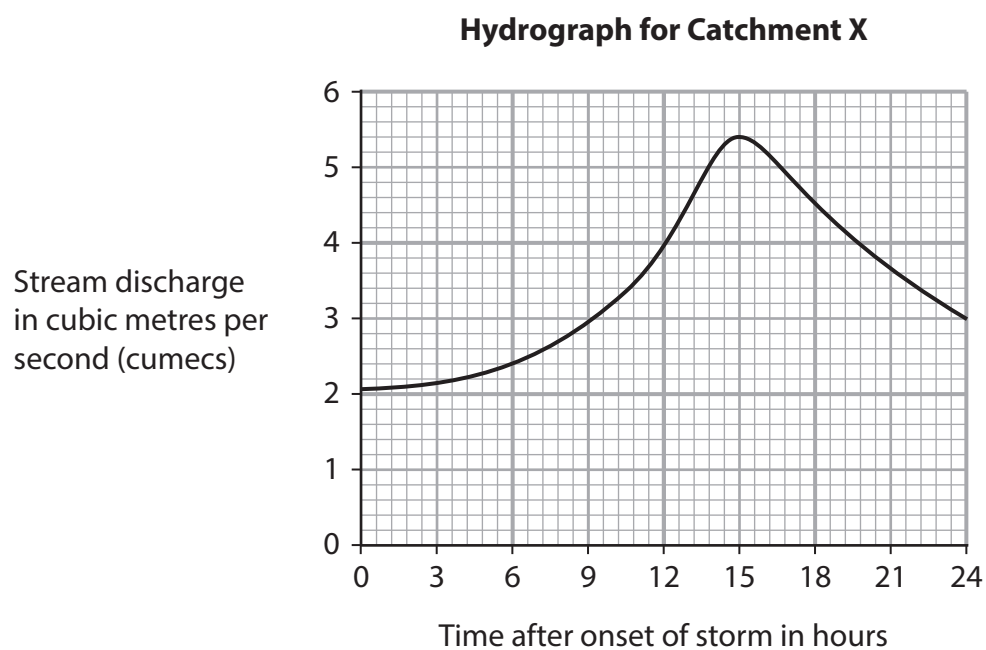
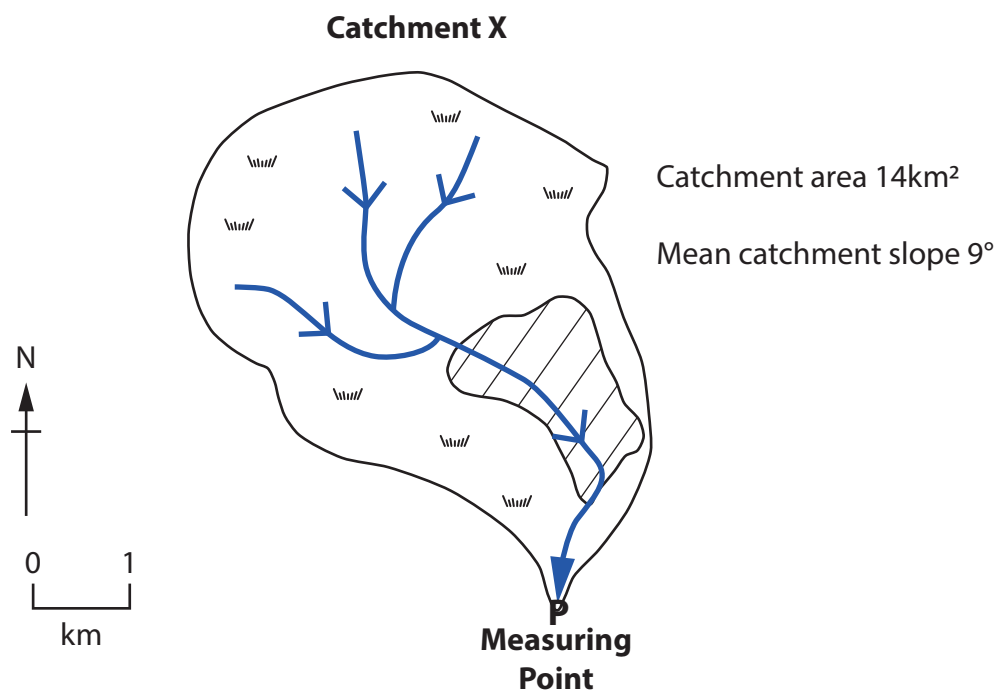
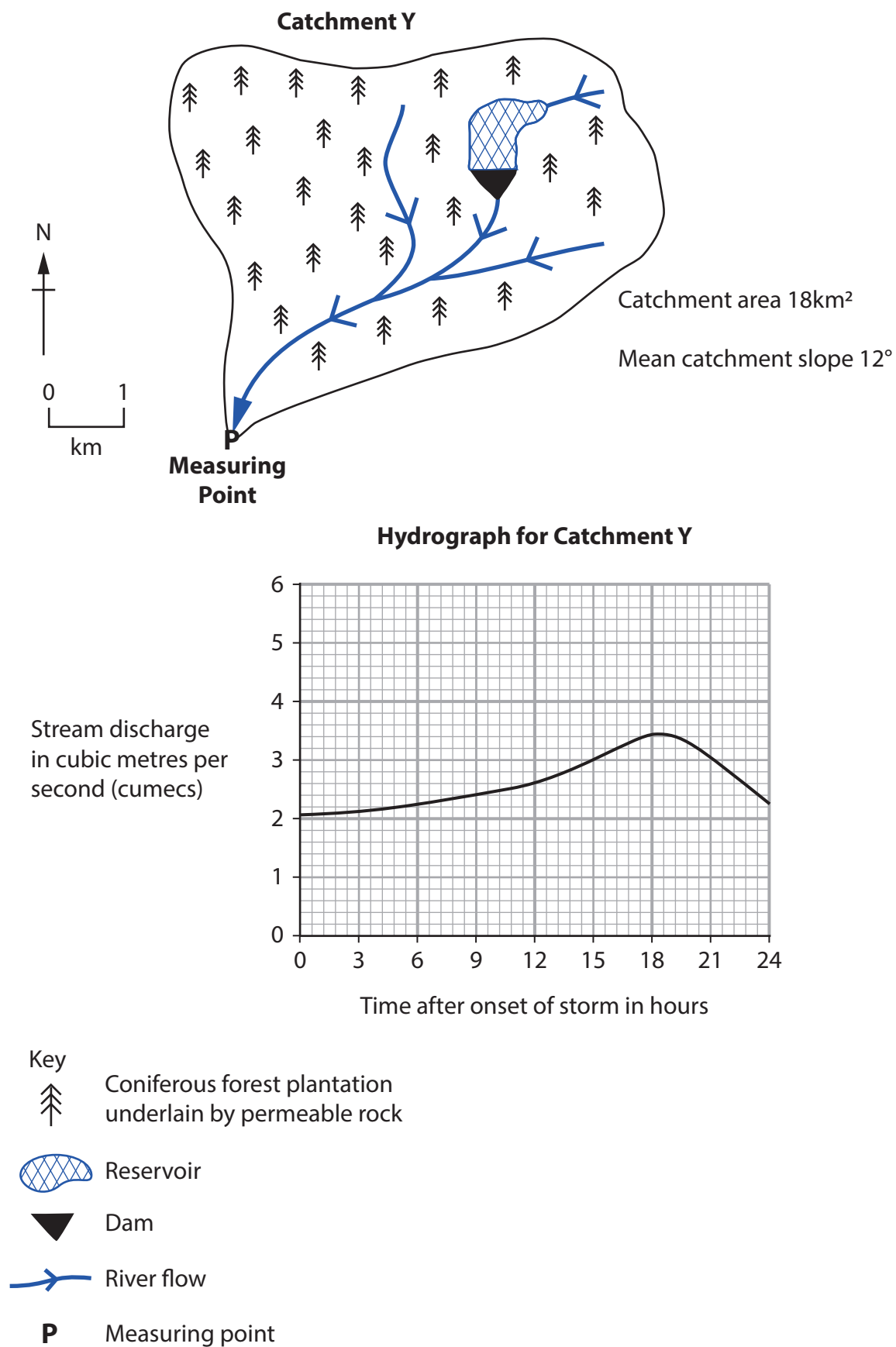


Figure 4b

A map and hydrograph of upland Catchment X

**Figure 4c****A map and hydrograph of upland Catchment Y**

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Acknowledgements

Pearson Education Ltd. gratefully acknowledges all the following sources used in the preparation of this paper:

Figure 1 volcano.si.edu

Figure 3b <https://www.climate.gov/news-features/understanding-climate/climate-change-global-sea-level>

Figure 4a © Peter Devlin/Alamy Stock Photo

