

\$833/77/11

Geography

Date — Not applicable Duration — 2 hours 30 minutes

Total marks — 50

Attempt ALL questions.

You will receive credit for appropriately labelled sketch maps and diagrams.

You must use the supplementary items and tracing overlays provided for annotation or as a base for diagrams. These resources should be placed inside the front cover of your answer booklet.

You should use the atlas provided.

Write your answers clearly in the answer booklet provided. In the answer booklet you must clearly identify the question number you are attempting.

Use **blue** or **black** ink. You may use pencil for the completion of Supplementary item B — tracing overlay.

Before leaving the examination room you must give your answer booklet to the Invigilator; if you do not, you may lose all the marks for this paper.





Total marks — 50 Attempt ALL questions

Question 1 — Map interpretation Gathering and processing techniques

To answer this question you will need to use

- Supplementary item A Ordnance Survey (OS) Map Extract Penrith, Patterdale and Caldbeck
- Supplementary item B tracing overlay
- Supplementary Item C photographs
- the atlas provided.

You should make detailed use of the whole map extract as well as using your atlas appropriately. You should also carefully read the information in the text boxes.

Fell running is a popular sport in the Lake District. It involves running in mountains and high moorland on either designated footpaths and/or in remote areas without footpaths. Map and navigational skills are essential. In September 2020 the Lake District is hosting the national fell running competition. The competition will take place over four days. It will attract visitors from across the UK. It is anticipated that there will be up to 2000 competitors.

- (a) On the tracing overlay (Supplementary item B) draw accurately a proposed route for this event. Your route should be between 12 and 15km long. The start and finish points should be clearly marked.
- (b) (i) Annotate your chosen route on the tracing overlay to highlight the reasons for your choice **and**
 - (ii) evaluate the impact(s) that the event may have on the local area.

3

Outdoor people counters are increasingly common along footpaths that are popular with tourists. Targeted locations for the counters could include

- hiking and nature trails
- mountain bike trails
- forestry and coastal tracks
- historical and geological sites
- outdoor visitor centres.

The electronic counters are laid underground and use radio-beam technology to continuously count the number of pedestrians who pass a designated point.

2

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2

2

2

Question 1 (continued)

Public footpaths can be adversely affected by high usage.

The Lake District National Park Authority (LDNPA) wishes to investigate varying footpath usage and its impact on the environment over 10 years.

- (c) (i) Using a six figure grid reference, identify a suitable location for the siting of an outdoor people counter. Justify your choice of location.
 - (ii) Discuss the advantages and disadvantages of using electronic outdoor people counters compared to traditional fieldwork gathering techniques.
- (d) (i) Explain a technique for processing and presenting the data collected from an outdoor people counter.
 - (ii) To provide additional data for the investigation, the width and depth of designated footpaths was recorded over the 10-year period. Evaluate the suitability of using cross sections to process and present this additional data.
- (e) Discuss one way in which the LDNPA could inform tourists about the adverse effects on footpaths caused by high public usage.

Historically in the Lake District, water has been used to power traditional industries using water wheels. More recently there has been interest from several communities in the Lake District and local landowners in the development of small hydropower schemes to generate electricity using fast-moving water. This is related to increasing energy costs, climate change concerns and awareness of sustainability.

Supplementary item C shows photographs of a proposed development at Hayeswater Gill (GR 423130).

- (f) Explain the suitability of a small hydropower scheme at this location.
- (g) Analyse the factors that have influenced the different land uses around Ullswater.

4

4

[Turn over for next question

Question 2 — Geographical data handling

To answer this question you will need to use

- Supplementary item D Diagram 1 Population of selected European cities (2013); Diagram 2 Selected European countries GDP, net migration and annual population change; information on Spearman's rank correlation coefficient
- the atlas provided.

Study Diagram 1.

- (a) Proportional circles have been used to show the population of selected European cities in 2013.
 - (i) Explain the factors that could account for the pattern of city population shown on the map.
 - (ii) Evaluate the effectiveness of using proportional circles to show this information.
- (b) A student wants to investigate whether the gross domestic product (GDP) of a country influences its net migration.
 - (i) State a null hypothesis for such an investigation.

Using the GDP and the net migration data shown in Diagram 2, the student has applied a Spearman's rank correlation coefficient to test the strength of the relationship. The result of the test can be found on Supplementary item D.

- (ii) Evaluate this result in terms of the null hypothesis.
 - (iii) Explain the suitability of using Spearman's rank correlation coefficient for measuring the relationship.
- (c) Diagram 2 shows GDP, net migration and annual population change for selected European countries.

Discuss possible reasons for the population changes shown in the table.

[END OF SPECIMEN QUESTION PAPER]

4

3

1

2

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6



M1 or A6(M) Motorway 📀 Service Area <mark>7</mark> Junction	
A 35	Dual carriageway	
A 30	Main road	
B 3074	Secondary road	
	Narrow road with passing places	
	Road under construction	
	Road generally more than 4 m wide	
	Other road, drive or track, fenced and unfenc	ed
>> > >	Gradient: steeper than 20% (1 in 5)	
\ Ferry \	14% (1 in 7) to 20% (1 in 5)	
	Ferry; Ferry P – passenger only	
	Path	
RAILWA	YS	
	— Multiple track Standard gauge	
•	Narrow gauge or Light Rapid Transit System	n
	↓ (LRTS) and station	
1	Road over; road under; level crossing	
adline Sulline	Cutting; tunnel; embankment	
•	Station, open to passengers; siding	
		d
POBLICI	Footpath	ď
	- Bridleway	
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Other tourist feature

Picnic site

Parking / Park and ride, all year / seasonal

Water activites

World Heritage site or area



English Heritage property

Z Fishing



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National Qualifications SPECIMEN ONLY

\$833/77/41

Geography Supplementary item C for Question 1

Date — Not applicable Duration — 2 hours 30 minutes





SUPPLEMENTARY ITEM C

Diagram 1 View of Hayeswater Gill from GR425129 looking north-west



SUPPLEMENTARY ITEM C (continued)



Diagram 2 A small hydropower scheme suitable for Hayeswater Gill

[END OF SUPPLEMENTARY ITEM C]

Acknowledgement of copyright

Supplementary Item C

Photograph 1	Photograph is adapted from Page 75 of "Pre-feasibility of Hydro Power Generation at Ten Sites Within the Lake District National Park," 22 April 2010 by Inter Hydro Technology.
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Geography Supplementary item D for Question 2

Date — Not applicable Duration — 2 hours 30 minutes





SUPPLEMENTARY ITEM D

Diagram 1 Population of selected European cities (2013)



SUPPLEMENTARY ITEM D (continued)

Country	GDP in US dollars	Net migration	Average annual
	(2012)	migrants per 1000	population change (%)
		population (2012)	(2004–2013)
Spain	29,863	5	1.5 to 2.0
Italy	35,925	5	0·0 to 0·5
Portugal	21,733	3	0·0 to 0·5
UK	41,787	3	0·5 to 1·0
Denmark	59,831	2	0.0 to 0.5
Luxembourg	110,697	8	2.0 to 2.5
Norway	100,818	2	0·5 to 1·0
Germany	46,268	1	0.0 to -0.5
Bulgaria	7,198	-3	-0.5 to -1.0
Poland	13,648	0	0.0 to 0.5

Diagram 2 Selected European countries: GDP, net migration and annual population change

Spearman's rank correlation coefficient



Value given for significance							
N (number of values)	Significance level	Significance level					
	95%	99%					
10	0.56	0.75					

[END OF SUPPLEMENTARY ITEM D]



\$833/77/21

Geography

Marking Instructions

These marking instructions have been provided to show how SQA would mark this specimen question paper.

National

Qualifications

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General marking principles for Advanced Higher Geography

Always use these general principles. Use them in conjunction with the detailed marking instructions, which identify the key features required in candidate responses.

- (a) Always use positive marking. This means candidates accumulate marks for the demonstration of relevant skills, knowledge and understanding; marks are not deducted for errors or omissions.
- (b) If a candidate response does not seem to be covered by either the principles or detailed marking instructions, and you are uncertain how to assess it, you must seek guidance from your team leader.
- (c) Use the full range of marks available for each question.
- (d) The detailed marking instructions are not an exhaustive list. Award marks for other relevant points.
- (e) Award marks only where points relate to the question asked. Where candidates give points of knowledge without specifying the context, award marks unless it is clear that they do not refer to the context of the question.

Marking principles for each question type

There is a range of question types in this question paper. For each question type, the following provides an overview of marking principles.

Explain questions

Candidates gain marks for explaining or suggesting reasons for the cause or impact of something, or for referring to causal connections and relationships. Candidates must do more than describe to gain marks here.

For source-based questions, candidates should make use of these and refer to them within their answer for full marks.

Where candidates provide a purely descriptive answer, or one where development is limited, award no more than half the available marks for the question.

Analyse questions

Candidates gain marks for identifying parts, the relationship between them, and their relationships with the whole; and for drawing out and relating implications.

Award an analysis mark where candidates use their knowledge and understanding or a source to identify relevant components (for example of an idea, theory, argument) and clearly show at least one of the following

- links between different components
- links between component(s) and the whole
- links between component(s) and related concepts
- similarities and contradictions
- consistencies and inconsistencies
- different views or interpretations
- possible consequences or implications
- the relative importance of components
- understanding of underlying order or structure.

Where candidates are asked to analyse they should identify parts of a topic or issue and refer to the interrelationships between, or impacts of, various factors. For example, where a question asks candidates to analyse the different impacts of flooding on land use, they should consider the effects of the immediate area and also, where appropriate, other areas. Candidates should support analysis with evidence where relevant.

Evaluate questions

Candidates gain marks for making a judgement of the success, failure, or impact of something based on criteria. They should give a brief description of the technique or methodology being evaluated, before offering an evidenced conclusion.

Discuss or comment on questions

Candidates gain marks for exploring ideas about a project, or the impact of a change. They should consider different views on an issue or argument. They should give a range of impacts or ideas within their answer.

Draw to scale questions

Candidates gain marks for drawing a shape or route to the correct size using the given scale of the map.

Question		on	General marking instructions for this N type of question m		Marking instructions for this question
1.	(a)		Award 1 mark for scale. Award 2 marks for route, 1 mark for an appropriate route and 1 mark for appropriate start and finish points.	3	The route could follow existing footpaths and go over open land as suggested in the text box. (1 mark) The route is likely to start at a parking area and although there is no requirement for it to start and finish in the same location, this should be considered when annotating. The start and finish points must be clearly marked. (1 mark) The route should be drawn to scale and be between 12 and 15km long. (1 mark)
	(b)	(i)	Candidates should provide detailed annotations, making good use of map- reading skills — using contour lines to think about gradient and topography as well as the key to identify land use or land features. Candidates could make use of their atlas to mention access from further afield.	7	Annotations may include The route starts at the car park at 317169. There are two car parks close by as it is likely that there will be cars from both competitors and spectators. There is also a public convenience beside the car park. The spectators could use the car park on the west of the A591. (2 marks) The first section of the route is a fairly gentle climb up to 320167 which will ease the runners in before the route steepens. (1 mark) The next km is a steady climb over scree and rough grassland and then a steep section up Browncove Crags to the spot height at 859m asl. (1 mark) The route then covers a more gentle climb up the valley to Helvellyn which is the second highest mountain in England — this could be an added attraction for the route — the views would be spectacular. (1 mark) The descent from Helvellyn skirts around the corrie and would involve running along Swirral Edge which is a ridge. This would be a challenging descent, particularly if runners are grouped together. (1 mark) The route then leaves the main footpath and follows a fairly gentle climb up a path to the cairn at 348158. (1 mark)

Q	Question		General marking instructions for this type of question	Max mark	Detailed marking instructions for this question
					The runners then have to negotiate Striding Edge which is also a steep and narrow ridge with rocky outcrops which could be a danger for runners. (1 mark)
					The remainder of the route is downhill with a steeper section near the finish at Comb Crags. The route finishes at the car park at 324136. (1 mark)
					The competitors could then be bussed back to the starting point. This means that the competitors do not have to run back on themselves, which could be an issue if there are slower runners, and it makes the course more interesting. (1 mark)
					Or any other valid point.
		(ii)	Candidates could refer to their route as well as the local area. Award a maximum of 2 marks if candidates do not give named examples or grid references in their answer. Award a maximum of 4 marks for either part (i) or part (ii).		Evaluation of impacts may include Local hotels (386167) and bed and breakfasts in Glenridding will see an increase in trade over the days that the competition runs. (1 mark) Other businesses such as cafes and gift shops may also see an increase in business. (1 mark) Local events may be organised in conjunction with the competition which will increase trade and might create some temporary employment for young people. (1 mark) Competitors may be encouraged back to the area and if successful it could become an annual event. (1 mark) The A591 will be a fast road that could become congested (1 mark) and at the entrances to both car parks (385171) there could be a danger from fast-moving traffic. (1 mark)
					Footpath erosion may be an issue that could be accelerated by the fell runners. (1 mark) Access to Helvellyn (343151) may be restricted for other activities, such as mountain biking, rambling and so on. (1 mark)
					Or any other valid point.

Quest	ion	General marking instructions for this type of question		Detailed marking instructions for this question
(c)	(i)	Candidates should give a six-figure grid reference. Award 1 mark for appropriate site and 1 mark for justification. Candidates could use the information in the text box to justify their choice.	2	 Possible answers may include Hartsop Hall (398120) (1 mark), which is an historical site and will possibly attract users from nearby Sykeside campsite. (1 mark) Dovedale Beck (389114) (1 mark), which is close to a footbridge and a popular route to Grisedale Tarn. (1 mark) Or any other valid point.
	(ii)	Candidates should refer to both advantages and disadvantages. Award a maximum of 3 marks for either.	4	 Possible answers may include OPCs are constantly collecting data, whereas using field researchers will only collect during sample periods (that need to be extrapolated over long periods) making the OPCs more accurate. (1 mark) OPCs can suffer technical faults, while researchers can make human errors. (1 mark) OPCs can only collect raw data, without question, while research can make judgement calls at the time of collection. (1 mark) OPCs will generate a far greater data set compared to researchers. (1 mark) Researchers can create multiple categories when collecting the data (for example age and gender) whereas the OPCs merely record a count. (2 marks) OPCs may prove too expensive in the short term, particularly if the LDNPA can use volunteers to collect sample data. (1 mark) Or any other valid point.

Q	Question		General marking instructions for this type of question		Detailed marking instructions for this question
	(d)	(i)	Candidates should explain one appropriate technique. Award 0 marks for naming the technique.	2	 Possible answers may include Given that the data is to be gathered over a 10-year period, descriptive statistics (for example mean) could be used to summarise the data (1 mark) and also show monthly and annual differences and/or similarities to allow for comparisons to be made. (1 mark) In conjunction with measures of central tendency, measures of dispersion (for example range and standard deviation) could be used to investigate variance and/or dispersion of the data. (1 mark) A line graph would be appropriate as the data gathered is continuous, (1 mark) showing change over time. (1 mark) A compound or multiple line graph would allow for the usage of different months or years to be shown by way of different coloured lines or sub-divisions (1 mark) to compare usage of the path over the 10-year period. (1 mark) Or any other valid explanation of another technique, for example divided bar graph.
		(ii)	Candidates should evaluate the suitability of using cross sections to process and present the additional data gathered. Candidates may mention strengths and weaknesses of cross sections.	2	 Possible answers may include A cross section is a profile (side view) of what is being researched, in this case the width and depth of footpaths, and therefore is an appropriate processing and presenting technique. (1 mark) A cross section shows changes in relief (shape, height, depth) along a line between two points (edges of the footpath). (1 mark) Cross sections provide a visual overview (different footpaths) of the survey area, (1 mark) allowing them to be compared. (1 mark) However cross sections, if not drawn accurately (exaggerated vertical scale), can be misleading. (1 mark) If all the cross sections are not drawn to the same scale it is difficult to make comparisons. (1 mark) Or any other valid point.

Q	uestion	General marking instructions for this type of question	Max mark	Detailed marking instructions for this question
	(e)	Candidates should discuss one way in which the LDNPA could inform tourists about the adverse effects on footpaths caused by high public usage. Candidates should provide a developed answer for one method.	2	 Possible answers may include An illustrated visual presentation on a loop could be shown in LDNPA Information Centres (Glenridding 386169), (1 mark) including photographs to raise awareness of paths with excessive erosion. (1 mark) Information leaflets and boards containing data and illustrations could be available at the starting point of footpaths. (1 mark) Leaflets could show the effects of footpath erosion and how this is being managed. (1 mark) Information could be posted on the LDNPA website in conjunction with advice on ways in which tourists could assist in helping to reduce and/or manage erosion. (1 mark) This could be regularly updated to inform tourists as to paths that are currently accessible or otherwise. (1 mark) Ranger-led walks and talks along footpaths that are either less damaged or have been managed by the LDNPA. This would help to educate the public or fieldwork groups (1 mark) and promote the work of voluntary groups in addressing footpath erosion. (1 mark) Or any other valid point.
	(f)	Award marks for appropriate use of the map and/or the atlas. Award marks for reference to either site and/or situation. Note: it is not assumed that all candidates will understand the principles behind generating power.	4	 Possible answers may include There is evidence of surface drainage which suggests that the geology is impermeable which will help maintain a good supply of water. (1 mark) Altitude extends to 430m and, according to the atlas, this part of the UK experiences over 1000mm of rainfall per annum which would provide a constant supply of water. (1 mark) The Gill flows down a steep v-shaped valley and this is ideal for generating power. (1 mark) Hayeswater is fed by smaller tributaries that make a reliable water supply. (1 mark) The lake is a fishing area which might be affected by construction. Anglers prefer quiet conditions and during construction there may be low-level noise from machinery. (1 mark)

Question	General marking instructions for this type of question n		Detailed marking instructions for this question	
			 Access may be a problem – the bridleway may need to be widened to allow access vehicles and this could result in a conflict in land uses arising as bridleways are designated for horse riding, walking and cycling. (1 mark) There are few buildings close by and villagers in Hartsop would not be able to see the development therefore there will be fewer planning objections. (1 mark) National Park status could result in planning consent being more difficult to obtain. (1 mark) Also, it is likely that transmission cables would need to be laid or built to transport the generated power and this could result in objections. (1 mark) Or any other valid point. 	
(g)	Candidates should make good use of the OS extract to analyse the different land uses, using grid references and named examples, where appropriate, to support their answer. Award a maximum of 2 marks for any one land use.	4	 Different land uses analysed may include Woodland – there is a variety of woodland types around Ullswater with natural and non-coniferous areas found on some of the steeper slopes (GR 400184), where other land uses are not suited. (1 mark) Trees will help to stabilise the thin soil on steep slopes and reduce run-off into Ullswater. (1 mark) Agriculture – rough grazing for sheep is likely to be found on the steep/high land (Sheepfold GR 408156) where the relief, climate and soils restrict other types of farming. (1 mark) At the southern end of Ullswater, where the land is flatter, lower and sheltered (U-shaped valley/floodplain) there is evidence of a field pattern with improved pasture and possibly some arable farming (Side Farm GR 398162). (1 mark) Transport – western side of Ullswater, where land is less steep than the eastern side, has advantaged the construction of the A592. (1 mark) Settlement – Glenridding and Patterdale are both sited on gently sloping land, with an easterly aspect, that is sheltered by high land and is also accessible via the A592. (1 mark) Or any other valid analytical point. 	

Question		on	General marking instructions for this type of question	Max mark	Detailed marking instructions for this question
2.	(a)	(i)	Candidates should refer to Map 1.	4	Possible answers may include
			To gain full marks, candidates should refer to specific examples from the map.		Most large cities, for example London, are found in north west Europe and this can be explained by factors such as low fertile relief, access to the coast, raw materials. (2 marks)
			Award 0 marks for description only.		Towards the periphery of Europe there are smaller and fewer cities, for example Stockholm, and this can be explained by a more extreme climate, fewer job opportunities, poorer communications. (2 marks)
					Throughout Europe many cities are located near the coast and this can be explained by access to trading routes, tourism and better economic opportunities. (1 mark)
					Or any other valid point.
		(ii)	Candidates should analyse the use of proportional symbols.	3	Possible answers may include
			Candidates may use either positive or negative factors.		It is clear to see which values are higher or lower by comparing the size of the symbols. (1 mark) They can be used for both a precise geographical location (a precise location) or a geographic area (country). (1 mark) You are able to extract numbers from the map by using the key to estimate the size of the population. (1 mark)
					However, the overlap of the symbols can mean congestion and therefore difficulty interpreting the values as seen on the map close to London and Manchester. (2 marks) The size of the symbol can also mean that the precise location of the city can be lost. (1 mark)
					Or any other valid point.

Question		General marking instructions for this type of question	Max mark	Detailed marking instructions for this question
(b)	(i)		1	There is no relationship or correlation between a country's GDP and net migration. (1 mark)
	(ii)		2	The null hypothesis must be accepted because the value of the test statistic (0.428) is not greater than the critical value in the significance table. (1 mark) The value of 0.428 is closer to 0 than 1, a perfect positive correlation, which also shows that there is no significant correlation between the two variables. (1 mark)
	(iii)	Do not award marks for comments which are the opposite or reverse of points already awarded marks.	4	 Possible answers may include The test is relatively quick and an easy calculation in comparison to the PPMC. (1 mark) The test uses data which can be ranked but this means that the test loses some of its accuracy as it is not using the actual values. (1 mark) Can only test for linear relationships so a scattergraph could be drawn to see if this is the case. (1 mark) It requires a sample size of at least seven observations – the larger the sample size the more reliable the result. (1 mark) Or any other valid point.
(c)		Candidates should use the material given and the atlas to help explore reasons behind the changes seen in the data table. Do not award marks for repetition. Do not award for comments which are the opposite or reverse of points already awarded marks.	6	Possible answers may include The higher the GDP of a country then the perception will be that there are more opportunities and so more migrants may be attracted to the country. (1 mark) Higher GDP could mean better job opportunities and living standards which is likely to draw people from countries that are less 'well off'. (1 mark) Higher GDP may also mean greater investment in education and health services and so attract people from other countries. (1 mark) This is highlighted by some of the results from the table such as Luxembourg whose net migration is 8/1000 and GDP is \$110,697. Norway has the next highest GDP and although net migration is smaller it is still showing a growth of population. (1 mark) Germany has a net migration for 2012 of 1 and a slight decline in its population over the time period which may be the result of low birth rate. (1 mark) Bulgaria is the only country with negative migration and Poland has a result of 0. Bulgaria, as a more recent member of the EU, may have seen some of its population migrate to other EU countries. It also has the lowest GDP in the table and migrants could see the pull of other countries which have more opportunities as a result. (1 mark)

Question		on	General marking instructions for this type of question	Max mark	Detailed marking instructions for this question
					With Poland many former migrants have returned to Poland as the economy of the country has improved. GDP is nearly double that of Bulgaria and opportunities have become better. (1 mark)
					Although the test statistic is not greater that the critical value, it is close to the 95% critical value, so although not statistically significant, there is a weak positive relationship between GDP and net migration for selected European countries.
					Or any other valid point.

[END OF SPECIMEN MARKING INSTRUCTIONS]