Paper 3 Mark scheme

Question number	Answer	Mark
1(a)	Award 1 mark for one of the following, a maximum 1 mark: use a float/ping pong ball/cork/orange/stick (1) use a flow meter with a smaller impellor (1). **Accept any other appropriate response.**	**(1)**

Question number	Answer	Mark
1(b)	Tape measure/ruler/chain/stopwatch **Accept any other appropriate response.**	**(1)**

Question number	Answer	Mark
1(c)	Award 1 mark for identification of a reason and a further mark for an explanation of the reason, up to a maximum of 3 marks: the sampling points are just below the confluences (1), therefore this is where you would expect a change in the discharge of the river (1) so that sampling between confluences is unlikely to show a change in discharge (1) stratified sampling will ensure that similar sites are used down the river, e.g. just below the confluence (1), other sampling approaches such as random and systematic (1) will miss the significant changes in discharge (1). **Accept any other appropriate response.**	**(3)**

Question number	Answer	Mark
1(d)(i)	A	**(1)**

Question number	Answer	Mark
1(d)(ii)	Mean depth = 0.28 m (1) Median depth = 0.16 m (1)	**(2)**

Question number	Answer	Mark
1(d)(iii)	Award 1 mark for identification of a reason and a further mark for an explanation of the reason, up to a maximum of 2 marks: site 5 is an outlier (1), which means using median, rather than mean ignores the influence of the outlier (1) median uses a rank of data whereas mean is an arithmetic measure of central tendency (1), therefore influence of anomalies is ignored (1). **Accept any other appropriate response.**	**(2)**

Question number	Indicative content
1(e)	**AO3 (4 marks)/AO4 (4 marks)** **AO3** ● Reliability is about making judgements on how close conclusions are to the actual changes occurring in the river channel/catchment. ● Reliability will be most likely linked to results via methods – evaluation including equipment errors and operator errors. ● How far data-collection methods used produced reliable results. ● Judgement about limitations of equipment used/ operator error. ● Recognition of issue in design methodology/sampling methodology may be flawed in terms of number of sites (spatial) and time of year (temporal). ● A supported judgement is reached about the reliability of the results and conclusions. ● An evaluation of how far the outcomes can be trusted (or repeated to obtain the same results). **AO4** ● There is evidence of using different skills and techniques to identify river changes. ● There is evidence of using different skills and techniques to reach conclusions about river changes downstream. ● There is evidence of own fieldwork conclusions linked to data and information.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark
2(a)	Award 1 mark for one of the following, maximum 1 mark: they could use other students to help hold down the tape (1) place stones on the tape (1) use of a ruler/chain (1) measure and pace the distance (1). **Accept any other appropriate response.**	**(1)**

Question number	Answer	Mark
2(b)	Award 1 mark for one of the following, maximum 1 mark: clinometer (1) smartphone app (1) pantometer (1) **Accept any other appropriate response.**	**(1)**

Question number	Answer	Mark
2(c)	Award 1 mark for identification of a reason and a further one mark for an explanation of the reason, up to a maximum of 3 marks: the sampling points are where the angle of the beach changes (1), therefore this is where you would expect a change in features of the beach e.g. sediment size and roundness (1) so that sampling between these changes in gradient are unlikely to show how significant change relates to the beach gradient (1) stratified sampling will ensure that similar sites are used throughout the width of the beach, e.g. where the angle changes (1), other sampling approaches, such as random and systematic (1), will miss the significant changes (1). **Accept any other appropriate response.**	**(3)**

Question Number	Answer	Mark
2(d)(i)	B	**(1)**

Question number	Answer	Mark
2(d)(ii)	Mean gradient= 7.8 (1) Median gradient = 7 (1)	(2)

Question number	Answer	Mark
2(d)(iii)	Award 1 mark for identification of a reason and a further mark for an explanation of the reason, up to a maximum of 2 marks: site 4 is an outlier (1), which means using median, rather than mean ignores the influence of the outlier (1) median uses a rank of data, whereas mean is an arithmetic measure of central tendency (1), therefore influence of anomalies are ignored (1). **Accept any other appropriate response.**	(2)

Question number	Indicative content
2(e)	**AO3 (4 marks)/AO4 (4 marks)** **AO3** ● Reliability is about making judgements on how close conclusions are to the actual changes occurring in the coastal stretch/environment. ● Reliability will be most likely linked to results via methods – evaluation including equipment errors and operator errors. ● How far data-collection methods used produced reliable results. ● Judgement about limitations of equipment used/ operator error. ● Recognition of issue in design methodology/sampling methodology may be flawed in terms of number of sites (spatial) and time of year (temporal). ● A supported judgement is reached about the reliability of the results and conclusions. ● An evaluation of how far the outcomes can be trusted (or repeated to obtain the same results). **AO4** ● There is evidence of using different skills and techniques to identify coastal processes. ● There is evidence of using different skills and techniques to reach conclusions about changes occurring at the coast. ● There is evidence of own fieldwork conclusions linked to data and information.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark
3(a)	Award 1 mark for the identification of an appropriate secondary data source and a further 2 marks expansion of how this explicitly supported the enquiry/investigation, up to a maximum 3 marks. There are a number of different contexts, e.g.: a large scale Goad plan map of the city centre dated 2005 (1) was used to compare current shop types collected as part of the primary fieldwork to establish a rate of shop turnover (1) which helped us to understand whether the town centre was 'healthy' (1) ONS neighbourhood statistics/Census data (1) was used to compare housing tenure with our primary data on environmental quality (1) so that we could make an overall judgement about the place (1). **Accept any other appropriate response.**	**(3)**

Question number	Answer	Mark
3(b)	Award 1 mark for the identification of a physical feature of the urban area you studied and, and a further mark expansion up to a maximum 3 marks: where the land was steepest (1) accessibility was reduced (1) which meant there were fewer larger retail outlets and services and more historical buildings and tourist attractions (1) the town centre area was limited by its proximity to the flood plain (1) which resulted in a concentration of retail outlets and light industry on the higher land to the north (1) and open space on the lower land/floodplain. **Accept any other appropriate response.**	**(3)**

Question number	Answer	Mark
3(c)	Award 1 mark for a disadvantage of the sampling strategy and a further 3 marks for an explanation of this disadvantage, up to a maximum of 4 marks: a disadvantage of random sampling is that you can unintentionally introduce bias (1) because you might be drawn to a certain social group (1), which could cause you to oversample them (1) and therefore affect the reliability of the results (1) a disadvantage of systematic sampling is that you might miss groups of people (1) because you are only sampling at nth intervals (1), which could cause some views to not be recorded (1) which could skew the results (1) a disadvantage of stratified sampling is that you need to access to background population information (1) in order to identify the correct groups to sample from (1) in order to avoid under-/over representation of a particular group within a population (1), otherwise the sample could lead to a biased/unreliable conclusion (1). **Accept any other appropriate response.**	**(4)**

Question number	Indicative content
3(d)	**AO3 (4 marks)/AO4 (4 marks)** **AO3** ● The student presented data within only six broad distance categories along the transect, therefore patterns of variation may be hidden within the 250 m interval. ● The distribution of the road is unknown and could be clustered in one specific area, producing a degree of bias/not representative of the land use of the whole of the town. ● The student has not surveyed between the roads and land use along the roads may be different to the land use between the roads. ● The student used only seven categories of land use, which meant some land uses may not fit within the categories selected. ● The student's results give a generalised pattern of land use but lack fine grain that would be useful if comparing to an urban geography model. **AO4** ● Residential was the dominant land use along the transect. ● Industry is found at four of the six transect distances (251-500, 501-750, 751-1000, 1251-1500). ● The amount of open space varies moving away from the CBD at the modal class 251-500. ● With increasing distance away from the CBD, there is a change in land use, although it becomes less varied past the 751-1000m location.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark
4(a)	Award 1 mark for the identification of an appropriate secondary data source and a further 2 marks expansion of how this explicitly supported the enquiry/investigation, up to a maximum 3 marks. There are a number of different contexts, e.g.: a large scale Goad plan map of the market town centre dated 2005 (1) was used to compare the current number of outdoor leisure shops with the number in 2005 and to establish the percentage change (1) which helped us to understand the changes in the town which had been brought about by increasing tourism (1) Google Street View (1) provided an opportunity to decide the best routes / places to complete a pedestrian count safely (1) which helped us avoid areas of high vehicular parking/hazardous locations (1) ONS neighbourhood statistics/Census data (1) was used to compare rural housing tenure in the village with our primary data on environmental quality (1) so that we could make an overall judgement about the impact of 2nd homes in the village (1). **Accept any other appropriate response.**	**(3)**

Question number	Answer	Mark
4(b)	Award 1 mark for the identification of a physical feature and a further 2 marks for an explanation of how this feature influences the flows of people, up to a maximum of 3 marks: the rural area had a picturesque valley (1), which attracted large numbers of tourists (1) which created tourism congestion, especially in the early afternoon when many people were visiting (1) the village centre area was divided into two by a river (1), which resulted in a concentration of services/amenities on the higher land to the north (1) that attracted a higher pedestrian flow (1) the village was located on a mountainous area (1) which attracted lots of hill walkers (1). As a result, there was a large number of outdoor shops selling waterproof clothing (1). **Accept any other appropriate response.**	**(3)**

Question number	Answer	Mark
4(c)	Award 1 mark for a disadvantage of the sampling strategy and a further 3 marks for an explanation of this disadvantage, up to a maximum of 4 marks: a disadvantage of random sampling is that you can unintentionally introduce bias (1) because you might be drawn to a certain social group (1), which could cause you to oversample them (1) and therefore affect the reliability of the results (1) a disadvantage of systematic sampling is that you might miss groups of people (1) because you are only sampling at nth intervals (1) which could cause some views to not be recorded (1) which could skew the results (1) a disadvantage of stratified sampling is that you need to access to background population information (1) in order to identify the correct groups to sample from (1), in order to avoid under-/over representation of a particular group within a population (1), otherwise the sample could lead to a biased/unreliable conclusion (1). **Accept any other appropriate response.**	**(4)**

Question number	Indicative content
4(d)	**AO3 (4 marks)/AO4 (4 marks)** **AO3** • The student presented data within only six broad time categories, therefore patterns of variation may be hidden within the time 8 am to 8pm. • The selection of sites is unknown and could be clustered in one specific area, producing a degree of bias/not representative of the traffic within the whole of the town. • The student has used only six locations next to roads and the patterns of traffic may different in other road locations, e.g. bigger or smaller roads. • The student used only seven categories of vehicle, which meant some transport types may not fit within the categories used. • The student's results give a generalised pattern of traffic but lack fine grain that would be useful if comparing to a comparable market town for instance. **AO4** • Overall, cars are the modal class for the whole day but tourist coaches are the modal class from 10 am to 12 pm and 2 to 4pm and bicycles are 12 to 2pm. • Buses could run a consistent service, but their proportion of total traffic could vary, depending on the volume of traffic on the road. • Motorbikes always have a small proportion but taxis have no representation from 2 to 4 and lorries have no representation from 4 to 6 • Tourist coaches are their highest proportion from 10 to 12 and 2 to 4.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–3	● Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) ● Few aspects of the enquiry process are supported by the use of geographical skills to obtain information, which has limited relevance and accuracy. Communicates generic fieldwork findings and uses limited relevant geographical terminology. (AO4)
Level 2	4–6	● Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) ● Some aspects of the enquiry process are supported by the use of geographical skills. Communicates fieldwork findings with some clarity, using relevant geographical terminology occasionally. (AO4)
Level 3	7–8	● Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) ● All aspects of the enquiry process are supported by the use of geographical skills. Communicates enquiry-specific fieldwork findings with clarity, and uses relevant geographical terminology consistently. (AO4)

Question number	Answer	Mark
5(a)(i)	England	**(1)**

Question number	Answer	Mark
5(a)(ii)	Award 1 mark for each of the following up to a maximum of 2 marks: dominance of mountains and moorlands in Scotland (1) lowland areas tend to be more enclosed (1) England grows more arable crops (1). **Accept any other appropriate response.**	**(2)**

Question number	Answer	Mark
5(b)(i)	9.3	**(1)**

Question number	Answer	Mark
5(b)(ii)	Award 1 mark for each of the following, up to a maximum of 2 marks: some areas have fewer job opportunities (1) some areas have fewer transport connections than others (1) an elderly population may not want to move from the area in which it has lived for a long time (1) some areas have high house prices that are too expensive for incoming population to afford (1) **Accept any other appropriate response.**	**(2)**

Question number	Answer	Mark
5(c)(i)	C	**(1)**

Question number	Answer	Mark
5(c)(ii)	230	**(1)**

Question number	Answer	Mark
5(c)(iii)	Award 1 mark for a point about migration and a further mark for explanation of why is significant, up to a maximum of 4 marks: many short-term migrants decide to extend their stay (1) but may not extend their visa (1) the IPS survey is not judged to be robust (1) as it was initially designed to examine trends in tourism (1) hard to collate accurate data for some groups of people (1) such as asylum seekers/refugees/those who enter illegally (1). **Accept any other appropriate response.**	**(4)**

Question number	Indicative content
5(d)	**AO2** • The UK's population has been increasing over the past 50 years and particularly in the last 15 years. • One of the main causes of the UK's population growth has been the large net migration (more people moving to the UK to live compared with the number of those leaving to live in a different country). • Population growth will lead to social, political, economic and environmental challenges. • The term 'environmental' can be defined to include aspects of both natural and man-made features. • The demand for resources, in particular land to build homes, of a growing population which exerts ever-increasing pressure on the ecosystems and their goods and services. • Development can threaten ecosystems by disrupting the cycling of nutrient and interdependence of biotic and abiotic conditions they need to function. • Other factors, such as climate change, can also contribute to the increased pressure on the UK's ecosystems. • Distribution and characteristics of the UK's main terrestrial ecosystems means that they are not all in suitable locations/land for development. **AO3** • Many of the UK's most valuable ecosystems are already heavily protected from development and new housing, so the impact of population growth will vary across the UK. • Many of the migrants to the UK are economic migrants and will therefore only be attracted to certain parts of the country where employment opportunities exist. This means that the demand for resources and the resultant pressure on UK ecosystems will be unevenly distributed. For example, more economic migrants will be attracted to London and the surrounding area compared to northern Scotland. • Population growth may have indirect impacts on UK ecosystems. For example, a rise in the population in one area may increase levels of noise and air pollution and exasperate waste disposal challenges – which can have a knock-on effect on local ecosystems. • The UK's ecosystems are not wholly natural: they are part of a managed landscape; it is possible to adapt approaches to managing ecosystems in response to our growing population and the associated pressures and challenges that this brings. However, the capacity to manage an ecosystem to completely mitigate the threats posed by population growth vary across the UK and are often dependent on funding available from local councils,

Question number	Indicative content
	the presence of conservation groups and discussions linked to cost-benefit analysis.
	• The future trends of population growth and net migration are unknown, as are trends of natural increase. This may lead to different scenarios in terms of how much land is required for new housing. Also, figures for inbound and outbound migration are very unreliable so more secure data on this issue is required for the modelling and planning for different scenarios to be accurate.
	AO4
	• Figure 5a shows that England has the largest percentage of people living in urban areas already; England also has the smallest percentage of woodland (only about 10%).
	• Figure 5b shows that population growth is uneven: the largest population increases are in London (13.8%), SE England (8-9%), SW England (7.4%) and Northern Ireland (7.3%), whereas Wales (4.9%), Scotland (5.1%), NW England (4.2%) and NE England (2.8%) experience a smaller increase.
	• Figures 5a and 5b together indicate that highest levels of population growth are in England and Northern Ireland where farming is the largest ecosystem. Also, Figure 5e indicates that a large proportion of these farming areas are unproductive, e.g. 8.5% of farmland in SE England unproductive.
	• Figure 5c shows that the areas of high population growth (5b) are also areas with highest levels of greenbelt. For example, SE England has 2 520 ha and the SW has 2 780 ha.
	• Figure 5d does not provide evidence that net migration will continue to increase in the future.

Level	Mark	Descriptor
	0	No acceptable response.
Level 1	1–4	• Demonstrates isolated elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (A04)
Level 2	5–8	• Demonstrates elements of understanding of concepts and the interrelationship between places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	9–12	• Demonstrates accurate understanding of concepts and the interrelationship of places, environments and processes. (AO2) • Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Marks for SPGST		
Performance	**Marks**	**Descriptor**
SPaG 0	0	*No marks awarded:* ● Learners write nothing. ● Learner's response does not relate to the question. ● Learner's achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning.
SPaG 1	1	*Threshold performance:* ● Learners spell and punctuate with reasonable accuracy. ● Learners use rules of grammar with some control of meaning and any errors do not significantly hinder meaning overall. ● Learners use a limited range of specialist terms as appropriate.
SPaG 2	2–3	*Intermediate performance:* ● Learners spell and punctuate with considerable accuracy. ● Learners use rules of grammar with general control of meaning overall. ● Learners use a good range of specialist terms as appropriate.
SPaG 3	4	*High performance:* ● Learners spell and punctuate with consistent accuracy. ● Learners use rules of grammar with effective control of meaning overall. ● Learners use a wide range of specialist terms as appropriate.

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