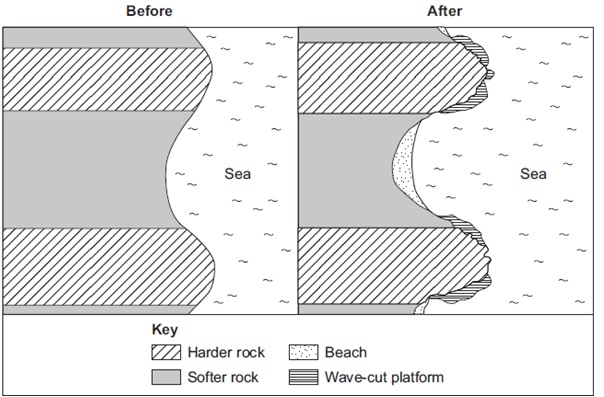
**Coastal Landscapes in the UK**

**Q1.** Study the photograph of a part of Dorset and sketch maps below showing changes in the shape of a coastline over time. Explain the formation of the physical features of the coastline shown in the images.



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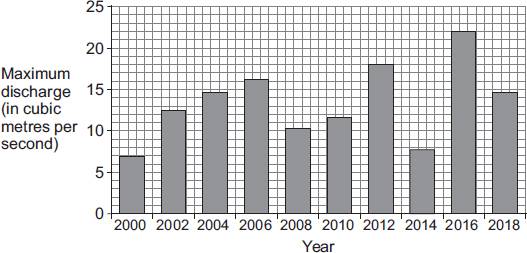
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**(Total 6 marks)**

**River Landscapes in the UK**

**Q2.** Study the graph below showing maximum discharge for a river between 2000 and 2018.



Using the graph, calculate the range of maximum discharge.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cubic metres per second

**(Total 1 mark)**

**Q3.** Explain how river meanders may change over time.

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**(Total 4 marks)**

**Q4.** Explain how river levées are formed.

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**(Total 4 marks)**

**Q5.** For a UK area at risk of flooding, outline the food management scheme used. To what extent has this management scheme been successful?

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**(Total 9 marks + 3 SPaG)**

**Urban Issues and Challenges**

**Q6.** Outline one reason why rates of natural increase are high in many cities in LIC/NEEs. **[2 marks]**

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**Q7** For a major city in a LIC/NEE, explain why managing traffic congestion may be challenging **[4 marks]**

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Mark schemes

**Q3.**

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| --- | --- | --- |
| **Level** | **Marks** | **Description** |
| 3 (Detailed) | 5 – 6 | AO2 Shows thorough geographical understanding of processes and landforms associated with a changing coastline.  AO3 Demonstrates thorough application of knowledge and understanding in analysing the landforms shown in the diagram. |
| 2 (Clear) | 3 – 4 | AO2 Shows some geographical understanding of processes and landforms associated with a changing coastline.  AO3 Demonstrates reasonable application of knowledge and understanding in analysing the landforms shown in the diagram. |
| 1 (Basic) | 1 – 2 | AO2 Shows limited geographical understanding of processes and landforms associated with a changing coastline.  AO3 May include limited application of knowledge and understanding in in analysing one or more landforms shown in the diagram. |
|  | 0 | No relevant content. |

•   **Level 3** (detailed) will be developed responses with supporting detail of the processes involved and the sequence of changes as the coastline evolves. Appropriate terminology will be used.

•   **Level 2** (clear) responses are likely to contain linked statements showing some understanding of the processes involved and some of the changes that occur as the coastline evolves. Some geographical terminology will be used, but processes may not be named.

•   **Level 1** (basic) responses will comprise simple ideas or random statements with limited or partial sequence and little reference to the processes involved. May consider one landform or focus on sequence only. Geographical terminology will be limited.

•   The formation of at least two landforms should be explained to access Level 3.

•   Allow labelled diagrams as long as they don’t duplicate the text.

Indicative content

•   Emphasis is on explanation, so processes of erosion should be outlined as well as the sequence of development of landforms as the coastal landscape changes. Some reference to depositional processes is also relevant.

•   Understanding of specific processes relevant to the formation of landforms shown-weathering, erosion, hydraulic action, corrasion/abrasion, attrition, differential erosion, wave refraction, longshore drift.

•   Landforms shown in the maps include headlands and bays, (bayhead) beaches and wave-cut platforms. Credit other associated landforms seen on photograph: cliffs, caves and stacks.

•   Analysis of the maps and photograph should emphasise increased unevenness in the shape of the coast from a rounded coastline to jagged headlands and wave cut platforms with bay in between. The photograph illustrates prominent cliffed headlands surrounded by low-lying curved bays. In distance is series of stacks at end of headland, with spit beyond.

•   Understanding of formation of **headlands and bays** and changes over time. Because of differences in resistance of rocks to erosion, some parts of the coast may retreat faster than others. This will happen where the rocks are at right angles to the coastline (a discordant coast). Over thousands of years the softer less resistant rock will be eroded more quickly than the harder more resistant rock and differences become more pronounced. Eventually there will be headlands that stick out into the sea and bays where the land has been worn back. The headlands are more exposed to wave attack and erosional landforms develop. Due to wave refraction the energy of the waves is then focused on the headlands and spread out in the bays.

•   **Beaches** develop at the head, or innermost part, of a bay. In this area wave action is usually not very strong and deposition occurs. The beach will not extend to the headlands because erosion from waves increases strongly towards the headlands and deeper water. Longshore drift may cause material to be moved along the bay.

•   Understanding of formation of **cliffs and wave-cut platforms**. The sea attacks the base of the cliff between the high and low water mark along a headland. A wave-cut notch is formed by erosional processes such as abrasion and hydraulic action. As the notch increases in size, the cliff becomes unstable and collapses, leading to the retreat of the cliff face. The backwash carries away the eroded material, leaving a wave-cut platform. The process repeats. The cliff continues to retreat.

•   Credit explanation of stack and/or spit formation-shown in the distance on photograph.

•   Analysis of sources demonstrates that the coastline is constantly changing due to combination of processes. Credit idea that continued wave action /refraction may eventually cause the coastline to become more straightened as headlands are worn back and bays receive more sediment.

•   Analysis of the formation of 2 landforms with clear application of knowledge and understanding to the diagram is sufficient to access maximum marks.

**AO2 – 3 marks**

**AO3 – 3 marks**

**[6]**

**Q4.**

15 (cubic metres per second)

**AO4 – 1 mark**

**[1]**

**Q5.**

|  |  |  |
| --- | --- | --- |
| **Level** | **Marks** | **Description** |
| 2  (Clear) | 3 – 4 | AO1 Demonstrates accurate knowledge about fluvial erosion and / or depositional processes and meander development.  AO2 Shows a clear geographical understanding of the interrelationships between fluvial environments and processes. Explanations are developed. |
| 1  (Basic) | 1 – 2 | AO1 Demonstrates some knowledge of fluvial erosion and / or depositional processes and meander development.  AO2 Shows limited geographical understanding of the interrelationships between fluvial environments and processes. Explanations are partial. |
|  | 0 | No relevant content. |

•   **Level 2** (clear) responses are likely to contain linked statements showing some understanding of the processes involved and the sequence of development. Appropriate geographical terminology.

•   **Level 1** (basic) responses will comprise simple ideas with limited or partial sequence and little reference to the processes involved. Geographical terminology will be limited.

Indicative content

•   The command is “explain”, so responses should provide a reasoned account of how and why a meander changes over time. Note that it is not essential to include the formation of a meander, although this can be credited. Emphasis is placed on change to existing meanders.

•   The question implies knowledge of the processes of erosion and deposition. Emphasis is on explanation, so processes may be outlined as well as the sequence of formation. Credit explanation of enlargement of meander belt, downstream migration of meanders, as well as development of oxbow lakes. Accept reference to initial formation (riffles and pools) if change and development over time are explained.

•   A meander is a winding curve or bend in a river. Water flows fastest on the outer bend of the river where the channel is deeper and there is less friction. Lateral erosion results in undercutting of the river bank and the formation of a steep sided river cliff. The development of meanders is due to both deposition and erosion. On the inside of the bend, where the river flow is slower, material is deposited on a slip off slope, as there is more friction. Over time, because of erosion and deposition, meanders gradually change shape and move across the floodplain and migrate downstream.

•   Credit further development including oxbow lake formation. Over time the horseshoe becomes tighter, until the ends become very close together. As the river breaks through, e.g. during a flood when the river has more energy, and the ends join, the loop is cut-off from the main channel. The cut-off loop is called an oxbow lake.

•   Credit relevant labelled diagrams as part of the explanation of processes and the sequence of meander development.

•   Credit reference to the **Ordnance Survey map of the River Severn in Shropshire** and a **photograph of the River Severn and its valley** if linked to development and change in meanders. The River Severn meanders across a broad floodplain, cutting into the outer bank where the water flows fastest, leading to lateral erosion. In places this widens the floodplain. On the inside bend deposition occurs, forming a bank of silt on the slip off slope, and gradually the meanders may migrate across the whole floodplain.

•   Sequence of formation and some reference to processes involved required to reach top of Level 2.

**AO1 = 2 marks**

**AO2 = 2 marks**

**[4]**

**Q6.**

One mark for the correct answer:

(a)     49 (metres)

Allow 50 (metres) – closest contour

**AO4 = 1 mark**

(b)     One mark for brief outline or description of the meander feature that can be seen in the photograph.

Accept any valid description.

E.g. It is the inner bend (of a wide meandering river )(1).

(It is an area of) deposition (1).

(It appears to be a) slip off slope (where material has been deposited by the river) (1).

No credit for river processes or for reference to the speed of river flow.

**AO4 = 1 mark**

**[2]**

**Q7.**

|  |  |  |
| --- | --- | --- |
| **Level** | **Marks** | **Description** |
| 2  (Clear) | 3 – 4 | AO1 Demonstrates accurate knowledge about river depositional processes and levee formation.  AO2 Shows a clear geographical understanding of the interrelationships between river environments and processes. Explanations are developed. |
| 1  (Basic) | 1 – 2 | AO1 Demonstrates some knowledge about river depositional processes and levee formation.  AO2 Shows limited geographical understanding of the interrelationships between river environments and processes. Explanations are partial. |
|  | 0 | No relevant content. |

•   **Level 2** (clear) responses are likely to contain linked statements showing some understanding of the processes involved and the sequence of formation. Appropriate geographical terminology.

•   **Level 1** (basic) responses will comprise simple ideas with limited or partial sequence and little reference to the processes involved. Geographical terminology will be limited.

•   The sequence of formation and some reference to processes involved are both required to reach the top of level 2.

Indicative content

•   The command is “explain”, so responses should provide a reasoned account of how and why levées form.

•   The question implies knowledge of the processes of deposition. Emphasis is on explanation, so processes may be outlined as well as the sequence of formation.

•   Credit relevant labelled/annotated diagrams.

•   Levées are long narrow ridges or raised embankments alongside the river. Composed of gravel, stones and alluvium. Steeper on channel side than land side.

•   Levées occur in the lower course of a river when there is an increase in the volume of water flowing downstream and flooding occurs.

•   Sediment that has been eroded further upstream is transported downstream.

•   When the river floods, the sediment spreads out across the floodplain. Friction with the land reduces velocity and causes deposition.

•   When a flood occurs, the river loses energy. The largest material (sand and gravel) is deposited first on the sides of the river banks and smaller material (finer silt and mud) further away.

•   After many floods, the sediment builds up to increase the height of the river banks, so the levées become higher than the surrounding floodplain.

•   If a severe flood event occurs, levées may burst and cause serious damage to surrounding land.

**AO1 – 2 marks**

**AO2 – 2 marks**

**[4]**

**Q8.**

|  |  |  |
| --- | --- | --- |
| **Level** | **Marks** | **Description** |
| 3  (Detailed) | 5 – 6 | AO2 Shows thorough geographical understanding of processes and landforms created by river erosion.  AO3 Demonstrates thorough application of knowledge and understanding in analysing the landforms shown in the photograph. |
| 2  (Clear) | 3 – 4 | AO2 Shows some geographical understanding of processes and landforms associated with river erosion.  AO3 Demonstrates reasonable application of knowledge and understanding in analysing the landforms shown in the photograph. |
| 1  (Basic) | 1 – 2 | AO2 Shows limited geographical understanding of processes and landforms associated with river erosion.  AO3 May include limited application of knowledge and understanding in analysing one or more landforms shown in the photograph. |
|  | 0 | No relevant content. |

•   **Level 3** (detailed) will be developed responses with supporting detail of the processes involved and the sequence of formation. Appropriate terminology will be used.

•   **Level 2** (clear) responses are likely to contain linked statements showing understanding of the processes involved and the sequence of formation. Some geographical terminology will be used.

•   **Level 1** (basic) responses will comprise simple ideas or random statement with limited or partial sequence and little reference to the processes involved. May consider one landform or focus on sequence only. Geographical terminology will be limited.

•   The formation of at least two landforms should be explained to access Level 3.

•   Allow labelled diagrams as long as they don’t duplicate the text.

Indicative content

•   The question implies knowledge of the processes of erosion as well as landforms associated with river erosion. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation.

•   Understanding of specific processes relevant to the formation of landforms shown. These include the erosional processes of hydraulic action and abrasion or corrasion. Erosion is most rapid during powerful flood events. Credit transportation processes such as traction and saltation. Mass movement processes may be relevant in the context of valley formation.

•   Landforms shown in the photograph include waterfall, gorge of recession, plunge pool, rapids. The link between waterfall retreat and gorge formation may be recognised.

•   Understanding of landform development. The formation of the waterfall should be explained in sequence, with some indication of the processes involved. The river may flow over an area of hard rock with softer more easily eroded rock underneath. Over time the softer rock is worn way more rapidly by processes of hydraulic action and abrasion, creating a waterfall. The water hits the bottom of the falls with great force. This erodes a deep hole called a plunge pool. The softer underlying rock is eroded and weakened. The softer layer collapses into the plunge pool, undercutting the hard cap rock. The cap rock cracks and then collapses.

•   Gradually the waterfall retreats upstream, leaving behind a steep sided gorge. Every time the overhanging cap rock breaks off the gorge retreats further and grows longer. There is turbulent fast flowing water in the gorge.

•   Allow other explanations such as knick points along the river caused by changing sea levels. Waterfalls are also found where hanging valleys form in glacial landscapes (as in this case).

**AO2 = 3 marks**

**AO3 = 3 marks**

**[6]**

**Q9.**

The question focuses on natural increase, it should be clear the candidate is

referring to this and not migration.

One mark for an initial overall comment or single relevant statement eg:

• there is better healthcare (1)

• the population is younger (1)

• the birth rate is higher in cities than rural areas (1)

Second mark for developing the comment eg:

• there is better healthcare (1) so more children survive and the population

grows (d)(1)/reducing the death rate in relation to the birth rate and leading

to natural increase (d)(1)

• the population is younger (1) so they are more likely to have children and

increase the population (d)(1)

• the birth rate is higher in cities than rural areas (1) because of the relatively

youthful population (d)(1).

No credit for definition of natural increase.

Allow 1 mark for generic comment on population increase re LIC/NEE

population increase

Q10

