Oxford Revise | Geography | Answers

Chapter 22 River processes and pressures

All exemplar answers given are worth full marks.

1.

a) D

b) Attrition is where rocks and stones wear each other away as they rub together and so are worn smaller, rounder, and smoother.
Abrasion is where sand and pebbles are dragged along the riverbed or washed against the banks wearing them down.
Accept suitable alternative answers.

c) A river transports its load in four ways. *Traction* is where larger stones a rolled along the bed of the river. Smaller stones are carried by *saltation* which involves them being picked up and then dropped again. The finest particles are carried along in the current in *suspension*. Some rocks are dissolved by the river and the chemicals which result are carried in *solution*.

d)

i) Levees are the natural embankments found along the banks of a river in its lower course.

ii) When a river floods it overflows its banks. The largest, heaviest material is deposited first, building the levee.

e) In the lower course of a river, the fastest current swings out to undercut the outside banks of the meander, depositing sediment on the inside bend. Over time, the shape of the meander is exaggerated, and the neck between meander loop narrows. When the current breaks through the neck, an ox-bow lake is formed, with deposition in the slowest moving water sealing off the old meander.

f) This question is level-marked:

Level	Marks	Description
3	6–8	• Accurate understanding of concepts and the interrelationship of places, environments and processes. • Applies understanding to deconstruct information and make logical connections throughout. • A balanced, well-developed argument. Judgements are supported with evidence throughout. • Uses geographical skills to obtain accurate information that supports arguments.

Level	Marks	Description
2	3–5	• Some understanding of concepts and the interrelationship of places, environments and processes. • Applies understanding to deconstruct information and make some logical connections. • Imbalanced argument with mostly relevant information. Judgements are occasionally supported with evidence. • Uses geographical skills to obtain accurate information that occasionally supports arguments.
1	1–2	• Isolated elements of understanding of concepts and the interrelationship of places, environments and processes. • Attempts to apply understanding to deconstruct information but this is flawed. • Unbalanced or incomplete argument with limited understanding. Judgements are supported with limited evidence. • Uses some geographical skills to obtain information with limited relevance and accuracy.
	0	No acceptable response

Example answer: *Waterfalls tend to occur in the upper course of a river. The gradient of a river here is steep so it is fast flowing and has high energy. The river, however, has relatively little water in it at this stage and much of the energy is lost through friction. The main force of erosion is downward giving the valley a characteristic V shape. If the river comes across a band of more resistant rock, despite the main erosive processes of hydraulic action, abrasion, and attrition, the downward erosion will not be as effective as the erosion taking place at areas of less resistant rock in the river's path. The more rapid erosion of this less resistant rock will lead to the formation of a step, which eventually is marked by a waterfall. The more resistant rock will be undercut and eventually collapse. A plunge pool will be formed at the base of the waterfall because of abrasion and hydraulic action. The repeating sequence of undercutting and collapse will cause the waterfall to recede, which may leave a steep-sided gorge downstream. It is therefore the processes of erosion, especially abrasion and hydraulic action, that are most important in the formation of the waterfalls, although weathering and mass movement will also play a part.*

2.

a)

i) 3510/3610

ii) Farming

iii) 350081

iv) A

v) Levees

vi) They are likely to be higher and thicker because of repeated flooding over the years. They could also have been increased in height and reinforced by human actions to reduce the flooding of the nearby fields.

vii) The relief is undulating rather than flat with the lowest land 9 m above sea level (369115) and the highest over 50 m just east of Neasham (3311). The steepest slopes are found along the River Tees at Low Moor Farm (3611), Bell's Wood (3610) and Beverley Wood (3407 and 3507).

b) In the lower course of a river, lateral erosion is dominant, widening the river valley and the river's channel. This results in a cross section with gentle valley sides and a wide, flat flood plain. In the upper course, the river energy is high, and river flow can drag boulders and pebbles along the riverbed. The channel is therefore eroded vertically, by the processes of abrasion and traction resulting in a V-shaped cross section and a narrow bottom.

c) This question is level-marked:

Level	Marks	Description
3	6–8	• Accurate understanding of concepts and the interrelationship of places, environments and processes. • Applies understanding to deconstruct information and make logical connections throughout. • A balanced, well-developed argument. Judgements are supported with evidence throughout. • Uses geographical skills to obtain accurate information that supports arguments.
2	3–5	• Some understanding of concepts and the interrelationship of places, environments and processes. • Applies understanding to deconstruct information and make some logical connections. • Imbalanced argument with mostly relevant information. Judgements are occasionally supported with evidence. • Uses geographical skills to obtain accurate information that occasionally supports arguments.
1	1–2	• Isolated elements of understanding of concepts and the interrelationship of places, environments and processes. • Attempts to apply understanding to deconstruct information but this is flawed. • Unbalanced or incomplete argument with limited understanding. Judgements are supported with limited evidence. • Uses some geographical skills to obtain information with limited relevance and accuracy.
	0	No acceptable response

Example answer: *Weathering mass movement and erosion all are important at different stages of the river's course. In the upper course, steep gradients give the river high energy so it cuts down vertically by a process of potholing. This is where rocks are drilled into the riverbed where they are trapped in swirling*

eddies. The sides of the valley are affected by weathering, especially freeze–thaw if the river is high in the mountains. This breaks up the rock and the mass movement processes of soil creep and rock falls results in the debris falling into the river which increases abrasion. As the river moves into its middle and lower courses, lateral erosion becomes dominant because more water has joined the main river from tributaries, so the river can carry a larger load. The fastest current starts to swing from side to side undercutting the outside banks of meanders, depositing sediment on the inside bed. The meanders get larger and wider and widen the valley further. In the lower course of the river deposition is the dominant process. The gradient is almost flat. The main effect of the river on the landscape is when it is flood. The river will overflow its banks dropping the heaviest materials first, forming levees and the finer silt is deposited over the flood plain forming layers of alluvium.

3.

a) Mass movement is the downward movement of weathered material under the influence of gravity.

b) Sliding; slumping
Accept suitable alternative answers.