

Mark Scheme (Results) January 2008

GCE

GCE Geography B (6471/01)

6471 Changing Landforms Management

Question Number	Question	
1.	(a)(i)	
	Answer	Mark
	<p>Named variable (e.g. width) increases / changes / decreases downstream.</p> <p>Accept any reasonable statement or question which can be tested using the data provided in Figure 1(a) (is there any reason why you can't award a mark?)</p> <p>Do not accept ideas related to sediment, or broad ideas such as how the river changes downstream</p>	(1)

Question Number	Question	
1.	(a)(ii)	
	Answer	Mark
	<p>Equipment used Stopwatch, tape measure and float (e.g. satsuma, etc) or flow vane.</p> <p>1 mark for any correct item of equipment 2 marks for method (1 basic idea, 2 development) 1 mark for understanding concept of velocity i.e. linking distance and time. May be implicit in description of method.</p>	(4)

Question Number	Question	
1.	(a)(iii)	
	Answer	Mark
	<p>Definition Discharge = average velocity x cross sectional area/quantity of water passing a point within a given time.</p> <p>Up to 2 marks for definition - 1 basic understanding, 2 more detail e.g. an amount/volume of water linkage to time i.e. proper definition as above</p> <p>Calculation velocity x cross sectional area (width and depth) 1 mark</p>	(3)

Question Number		Question
1.		(a)(iv)
		Indicative content
		<p>Describes: Calibre decreases, overall increase in quantity. Refer to method of erosion.</p> <p>Explains: Caused by erosion, process of attrition, maybe changing geology, available energy of river to transport, accept effect of humans e.g. dams</p>
Level	Mark	Descriptor
Level 3	5	Uses terminology. Describes and accounts for changes in size and quantity.
Level 2	4-3	Some description of change with explanation. Max 3 if only one change discussed.
Level 1	2-1	Simple description of changes (quantity and size). Limited attempt to explain.

Question Number		Question	
1.		(b)(i)	
		Answer	Mark
		<p>Expect some of the following:</p> <ul style="list-style-type: none"> • Meander creates variable flow, variety of plant and aquatic life (1) • Coarser gravels and stones give cover for fish (1) • Trees provide shading, decrease water temperatures(1) • Deeper water in pool provides habitat variety (1) • Undercut bank provides shelter (1) • River corridor allows river to flood naturally (1) • High ecological value of wetlands (1) • Tree planting to improve habitat/interception (1) • Natural features (e.g. tree, meander) retained/ reinstated/created e.g. restored channel (1) • Reference to soft engineering (1) <p>4 x 1 mark. Credit development to a maximum of 2 marks per point e.g. vegetation creates more shade, reducing water temperature (1) thereby encouraging greater diversity (1)</p> <p>Reference to sustainability likely to be implicit</p> <p>Ignore basic labelling e.g. undercut bank, meander</p>	(4)

Question Number	Question	
1.	(b)(ii)	
	Answer	Mark
	<p>Variety of answers possible. Accept any plausible response linked to a named group, such as:</p> <ul style="list-style-type: none"> • transport companies using rivers for freight-journey time may be increased (2) • local residents (of floodplain) may perceive river is not so well managed (1) • builders may lose chance to build on a floodplain and therefore lose potential source of income/profits (2) <p>Credit development of one point up to 2 marks, or two separate points.</p> <p>3 x 1 2 + 1</p>	(3)

Question Number	Question	
1.	(c)	
	Indicative content	
	<p>This question focuses on challenges that result from low flow or flooding. It's not about why flooding happens, but <i>managing the results</i>.</p> <p>Named examples not required but may get detail of Colorado, Darent, Piddle etc. Low flow option certainly more challenging than flooding. Expect some of the following:</p> <p>Low flow</p> <ul style="list-style-type: none"> • provision of water supplies and management of abstraction rates/declining water quality, salinisation, eutrophication linked to use of fertilisers • navigational issues due to deposition • channel changes • management of wildlife - impact of low flow on wetland areas • recreational impact and loss of income <p>Flooding</p> <ul style="list-style-type: none"> • Floodplain development problems • Meander migration • Hard engineering issues in populated areas and links to ecology versus sustainable solutions • Dam creation and associated issues such as loss of ecosystems, changes to hydrology downstream • Recurrence levels and risk • Need for integrated catchment management • Loss of life and property damage 	
Level	Mark	Descriptor
Level 3	10-9	Structured examination of management issues. Clear links to a range of examples.
Level 2	8-5	Describes and begins to explore problems of managing flooding or low flow issues.
Level 1	4-1	Descriptive account of flooding or low flow event.

Question Number	Question	
2.	(a)(i)	
	Answer	Mark
	A graph representing the flow or discharge of water past a point on a river over a short period of time e.g. 1 or 2 days. (2) Graph to show how a river reacts to a particular storm. (1) Graph to show variation in discharge. (1) 2 x 1 mark	(2)

Question Number	Question	
2.	(a)(ii)	
	Answer	Mark
	Interception by vegetation, water drips down on ground, infiltration into soil, through flow to river, or percolation and ground water flow. Maybe some water falling directly into channel. Little water actually reaches river/may be delayed. 4 x 1 mark for processes applicable to diagram A. Credit development to max 2. Do not accept list of terms or surface flow/overland flow.	(4)

Question Number	Question	
2.	(a)(iii)	
	Answer	Mark
	Less ground cover due to bare fields and relatively less vegetation will cause less interception and more overland flow. Water reaches river more quickly causing a steeper hydrograph. May mention role of machinery in compacting ground; ploughing down slope will create tunnels and graph will be steeper. Increase in discharge. Single point marking. Irrigation and soil erosion irrelevant. 1 for reference to land use, 1 for relevant process, 1 for link to hydrograph shape.	(3)

Question Number	Question	
2.	(a)(iv)	
	Answer	Mark
	<p>There are 3 ways to answer this: either hydrological susceptibility of landscape, or likely impacts on people, or a mixture of both.</p> <p>Flooding results from rapid arrival of water at river (flashy hydrograph) and inability of channel to manage increased volume. Expect role of impermeable surfaces, drains and sewers, lack of floodplain, less vegetation, maybe presence of bridges etc, damage to property, loss of life, impact on environment, disruption to traffic, economic losses etc.</p> <p>3 x 1 mark.</p>	(3)

Question Number	Question	
2.	(b)(i)	
	Answer	Mark
	<p>The variation or change in discharge (1) annually/monthly/seasonally (1)</p>	(2)

Question Number	Question	
2.	(b)(ii)	
	Answer	Mark
	<p>D B C A</p> <p>3 marks all correct, 2 marks 2 correct, 1 mark 1 correct</p>	(3)

Question Number		Question
2.		(b)(iii)
		Indicative content
		<p>Examiners MUST consult Figure 2(b) when marking this question.</p> <p>A R Shannon, Ireland. Temperate climate, role of mountains creating relief rainfall. Drier summers winter maximum</p> <p>B R Guadalquivir, S Spain. Mediterranean climate, hot dry summer, high evaporation rates, higher winter discharge. Credit permeable rock.</p> <p>C R Wisla, Poland. Continental climate, snow in winter so low discharge, high rates of evapotranspiration</p> <p>D R Rhine, Germany. Summer peak from snow and glacial met, large river so higher discharge</p>
Level	Mark	Descriptor
Level 3	3	Sound explanation of changes in graph.
Level 2	2	One well developed idea or several relevant undeveloped statements e.g. river discharge is low because evaporation rates are high in summer.
Level 1	1	Basic idea only e.g. river discharge is low because it is hot.

Question Number		Question
2.		(c)
		Indicative content
		<p>Very broad question so expect a variety of approaches. Could look at demand for water, rising population/urbanisation need for multiple-use, need for dams for HEP/flood control, abstraction etc.</p> <p>Credit detail well linked to chosen river basin. Expect Colorado, Mississippi etc.</p>
Level	Mark	Descriptor
Level 3	10-9	Structured discussion, which links the need for management to a range of pressures. Clear links to chosen river basin.
Level 2	8-5	Some structure which explores some reasons for management. Linked with chosen basin. How and why the river needs to be managed.
Level 1	4-1	One or two ideas about river management (e.g. need to control flooding), generalised and not well linked to a particular river basin. The story of how a river is managed.

Question Number	Question	
3.	(a)(i)	
	Answer	Mark
	<p>Benefits building up beach source area for dunes?, creates sheltered area, economic benefit for tourism/leisure, and dock area etc, beneficial to organisms that will use rocks as habitat, absorb wave energy</p> <p>Problems interrupts longshore drift so sediment cell modified, may get erosion further along coast, visual pollution, expensive to construct/repair</p> <p>Point marking only, 2 marks for benefits and 2 marks for problems.</p>	(4)

Question Number	Question	
3.	(a)(ii)	
	Indicative content	
	<p>Sea wall protected by beach, which absorbs wave energy. Wall protects high value coastline. Riprap protects toe of sea wall to minimise undercutting. Rock breakwaters/groynes absorb incoming wave energy and combat sediment removal by longshore drift between them. Bastions reinforce limits of beach. Beach nourishment of coarse sand builds beach and is removed at a slower rate than fine sand. Dunes provide further line of defence in south of scheme. May mention role of defences in coping with offshore channel.</p>	
Level	Mark	Descriptor
Level 3	5	Clear understanding of how scheme works. Uses appropriate terminology.
Level 2	4-3	Identifies how some aspects of the scheme link together.
Level 1	2-1	Describes individual aspects of scheme.

Question Number	Question	
3.	(b)(i)	
	Answer	Mark
	<p>Any two relevant changes, each linked to direction e.g. increase in number of species, density/ground cover by vegetation, plant height; older vegetation furthest away from sea, type (characteristics) will change, amount will change, diversity will change</p> <p>2 x 1 mark</p>	(2)

Question Number	Question	
3.	(b)(ii)	
	Indicative content	
	Change related to temperature/ humidity, salt content, wind/shelter, pH level of soil, depth of soil, distance from sea, availability of water etc.	
Level	Mark	Descriptor
Level 3	5-4	Sound knowledge and understanding of change in sand dunes. Clear understanding of zonation/uses appropriate terminology.
Level 2	3-2	Knowledge and understanding of change in sand dune. Likely to focus on one reason/change only.
Level 1	1	One or two ideas about change but not well linked to sand dunes conditions.

Question Number	Question	
3.	(b)(iii)	
	Answer	Mark
	<p>Most likely to be pond but could be sand dune, salt marsh, coral reef. May have more than three levels. Need sequence of primary producer, herbivore, carnivore, etc</p> <p>Pond T1 green plants such as phytoplankton, algae, microscopic plants, pond lilies, T2 herbivores such as mayflies, small crustaceans, nymphs T3 carnivores such as fish who consume plants and animals from the first and second trophic levels.eg. great diving beetle</p> <p>Sand dune T1 marram, elder, mosses and lichens, T2 wood mice, shrew, field vole, rabbits wasps, beetles T3 humans, kestrels, oyster catcher</p> <p>Marsh T1 sedges, grasses, bulrushes T2 mosquito, snail ,snow geese T3 hawk ,eagle, seal</p> <p>Coral reef T1 reef-building or hematypic corals seaweed, blue green algae T2 sea urchin, star fish T3 parrot fish, humans</p> <p>1 mark limited trophic diagram. Second mark for development. Likely to be generalised. 3 marks for an ecosystem-specific diagram - may have errors or be incomplete. 4 marks for an accurate diagram using terminology.</p>	(4)

Question Number	Question	
3.	(c)	
	Indicative content	
	<p>Ecosystem must be named but does not have to be located - coral, wetland, sand dune etc.</p> <p>Most likely to be threats from humans:</p> <ul style="list-style-type: none"> • Tourism - trampling, litter, fire • Urban development - pollution of water, water abstraction lowering water table, drainage, building • Agriculture - grazing, reclamation, water pollution • Management - introduces alien species, e.g. pines • Effects of global warming e.g. sea level change/increased temperatures <p>To access higher levels must link to specific ecosystem e.g. decreases species diversity, added nutrient change water quality and increases growth of algae, trampling wipes out certain species e.g. lizards if no cover on sand dunes etc.</p>	
Level	Mark	Descriptor
Level 3	10-9	Structured account of a variety of threats, well exemplified and makes good use of appropriate terminology.
Level 2	8-5	Describes and begins to explain some specific threats to chosen ecosystem.
Level 1	4-1	Some general threats identified but little or no exemplification or link to a named ecosystem.

Question Number	Question	
4.	(a)(i)	
	Answer	Mark
	<p>Headland, cliffs, (sandstone), undercut/wave-cut notch at base, bedding planes, landslide/rockfall, cave, unconsolidated material (boulder clay) on top with vegetation and slump, no beach, wave cut platform.</p> <p>1 mark each.</p> <p>Do not credit human features or birds.</p> <p>Do not credit processes, such as undercutting.</p>	(4)

Question Number	Question	
4.	(a)(ii)	
	Answer	Mark
	<p>Details of sub-aerial processes such as surface runoff, rain wash, weathering by wind and frost action, mass movement etc to max 3 marks each.</p>	(4)

Question Number	Question	
4.	(a)(iii)	
	Answer	Mark
	<p>Type rock is relatively hard (sandstone/shales) so relatively resistant. Some softer, more unconsolidated material (boulder clay) at top of cliff is slipping and eroding more rapidly. Causes lubrication leading to rock fall? Shale at bottom may contribute to notch.</p> <p>Structure layers are creating differential erosion. May get details of corrasion from talus at base of cliff.</p> <p>Do not credit broad headland and bay commentary. For each aspect, credit 1 mark for characteristic and second mark for link to erosion.</p>	(4)

Question Number	Question	
4.	(a)(iv)	
	Answer	Mark
	<p>Wave height links to wave energy and capacity for erosion/transport of larger material. Increased erosion.</p> <p>Severe storms are usually accompanied by heavy rainstorms leading to an increase in lubrication and land slipping.</p> <p>4 x 1 mark, credit development up to 3 per aspect</p>	(4)

Question Number	Question	
4.	(b)	
	Answer	Mark
	<p>Expect some of the following:</p> <ul style="list-style-type: none"> • Geology - headland on limestone/basalt/bay in coal • Links headland to hard rock • Links bay to soft rock • Concordant/discordant • Estuary formed along boundary between old red sandstone and limestone • River estuary linked to structure • Microfeatures within one rock type • River exploits weaknesses <p>Do not credit what may happen in the future.</p> <p>4 x 1 mark, credit development up to 2 marks per point</p>	(4)

Question Number	Question	
4.	(c)	
	Indicative content	
	<p>Thermal expansion of oceans and melting of Arctic/Antarctic ice caps - lead to eustatic change. Flooding of lowland areas - Bangladesh, Maldives E/SE England, Netherlands etc. Link to decrease in tourism, coastal protection schemes, agricultural land lost, displacement of populations (environmental refugees) etc. More extreme weather events increases likelihood of more hurricanes/tropical storms/storm surges etc leading to increased erosion on low lying/ vulnerable coasts. Impact of increased CO₂ levels on water - greater acidity of water changing ecosystems. Higher water temperatures - expansion and flooding. Bleaching of coral reefs.</p>	
Level	Mark	Descriptor
Level 3	10-9	Structured account examining a range of likely impacts. Well exemplified with a range of locations.
Level 2	8-5	Some structure to an answer which identifies obvious impacts. Tends to describe or list ideas. Some named locations. Max 6 if only one country.
Level 1	4-1	One or two ideas such as rising sea level. Generalised and not clearly linked to location.

Question Number	Question	
5.	(a)(i)	
	Answer	Mark
	<p>Expect some of the following:</p> <ul style="list-style-type: none"> • Cost benefit analysis (is it economically viable?) - may develop this and give details on jobs, income gained versus management expenditure • Land use (tourism versus urban, versus agricultural land) • Impact on local ecosystems • Likelihood of flooding (recurrence) • Desire for sustainable solutions • Political considerations • Knock on effects <p>Expect a range of ideas, probably jumbled up. 4 x 1 mark or developed points up to 2 marks each.</p>	(4)

Question Number	Question	
5.	(a)(ii)	
	Indicative content	
	<p>Sustainability - schemes that meet the needs of the present without compromising the ability of future generations to meet their own needs. Key aspects - cost effective, often involve local people in decision making, economically/ecologically sound, natural protection etc. NB candidates will almost certainly imply sustainability rather than referring to it directly.</p> <p>Option 2 Do nothing - accept that there is no economically or technically viable solution- cost effective, allows chance to await new techniques, breaks cycle of knock on effects.</p> <p>Option 3 Managed retreat - avoids building defences. Existing schemes may be dismantled or abandoned. Preserves natural coastline. Reduces coastal squeeze, supports ecosystems.</p>	
Level	Mark	Descriptor
Level 3	6-5	Sound knowledge and understanding of sustainable management and of both options. Sophisticated terminology.
Level 2	4-3	Knowledge and understanding. May focus on one option only/limited development of sustainable concept. May be unbalanced/repetitive.
Level 1	2-1	One or two ideas, not developed/exemplified. Generalised. Limited understanding of sustainability.

Question Number		Question
5.		(b)(i)
		Indicative content
		Examiners MUST refer to Figure 5(b) when marking this item. A wide range of answers is expected here, credit anything reasonable from the resource e.g. do not credit footpath erosion.
Level	Mark	Descriptor
Level 3	6-5	Reasoned account. Understands linkage between issues.
Level 2	4-3	Describes some impacts. Simple statements, not well developed or focuses on one issue only. Max 3 for good list.
Level 1	2-1	One or two ideas about pollution and losing money.

Question Number	Question	
5.	(b)(ii)	
	Answer	Mark
	Examiners MUST refer to Figure 5(b) when marking this item. May tackle this with specific methods for each impact e.g. dispersal for oil spill, but more likely to look at cost benefit analysis, integrated management, SMP, or may outline a plan e.g. set objectives, consult experts, consider various methods, publish a plan, pass/enforce laws or quotas, more litter bins. Single point marking. Credit development to max 2 per point. Max 3 for high quality list.	(4)

Question Number		Question
5.		(c)
		Indicative content
		This is about erosion and it's effects on people, their lives and their environment. It is a broad question, which can be tackled in several ways. Location must be a stretch i.e. more than one location on a larger stretch.
Level	Mark	Descriptor
Level 3	10-9	Structured account, well exemplified and balanced. Makes good use of appropriate terminology. Range of effects on people and their environment.
Level 2	8-5	Describes some relevant effects but with limited detail or range of ideas. Recognisable locations. May be unbalanced. Max 6 for one location only e.g. Barton
Level 1	4-1	Some effects identified but little or no exemplification or link to named coastal locations. Generalised e.g. people have to move.