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Mark Scheme (Standardisation)
Summer 2008

GCE

GCE Geography B (6471/01)

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Registered Office: One90 High Holborn, London WC1V 7BH

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark
1(a)(i)	1 mark for each correct answer – maximum 2 marks. • 1. Identify the drainage basin with the highest sediment yield per square km - **G** • 2. Identify the smallest drainage basin on the map - **E**	**(2)**

Question Number	Answer	Mark
1(a)(ii)	Sediment increase • Ploughed fields may encourage rill erosion • Cleared ground for building will expose bare rock and soil and therefore more sediment • Deforestation increases overland flow and yields more sediment • Dams trap sediment upstream Sediment decrease • Vegetation/forest will reduce sediment by increasing interception and overland flow so less sediment available. • Urban areas produce low amounts of sediment unless construction sites are present • Dams reduce sediment load downstream 4 x 1 mark or (more likely) 2x2 marks for developed points. Credit appropriate use of terminology as development.	**(4)**

Question Number	Answer	Mark
1(a)(iii)	Other factors include climate/weather, rock type, topography, altitude, human activity that changes river channel e.g. dams, channelisation. No CREDIT for dams if used in 1aii. NO CREDIT for aspects of land use such as urbanisation, vegetation cover, deforestation. 1 mark for relevant factor. e.g. Rock type 1 mark for explaining its relevance. Unconsolidated rocks(1) such as clay are easily eroded and therefore will increase the amount of sediment in the river(1) 1 mark for further development or use of terminology/ example	**(3)**

Question Number	Answer	Mark
1(a)(iv)	• Reduction in channel capacity increases flood risk • Irrigation channels blocked-affects crops. • Shipping channels blocked e.g. Mississippi • Sedimentation of lake behind dam- problems for HEP turbines and reduction in storage capacity • Detrimental impact on ecosystems e.g. gills blocked on fish, coral loss • Loss of water quality • Dredging is an expensive process Single point marking, credit explanation of why extra sediment is a problem and /or examples to max 3 per point.	**(4)**

Question Number	Answer	Mark
1(b)(i)	• Avon has a higher discharge than Colne all year round. • Colne's regime is flatter (less variation) from April-November whereas Avon's regime has a more variable pattern throughout the year. 2x 1 mark for accurate comparisons.	**(2)**

Question Number		
1(b)(ii)		• Colne flows on chalk so likely to be significant amount of water-stored underground, which reduces discharge whereas Avon flows over clay, which is impermeable. • Greater surface runoff causes higher discharges. • Impact of seasonal rainfall and wet winters, soil moisture deficit on late summer, shape of basin, drainage network etc. • May mention role of urban development/abstraction in lowering summer discharge.
Level	Mark	Descriptor
Level 1	1-2	Limited relevant knowledge, e.g. geology or other factor. Max 2 marks if no reference to rock/soil type.
Level 2	3-4	Some valid ideas showing detailed understanding of geology (max 3) and identifies other factors.
Level 3	5	Clear understanding of geology and several other factors. Uses appropriate terminology.

Question Number		
1(c)		Expect a range of approaches here. May look at planning e.g. Integrated River Management plans or may examine different strategies/methods such as river corridors, realigning meanders, creation of riffles, buffer strips, bankside vegetation planted, sluice gates, wetland use and restoration, partial dredging etc. Hard engineering e.g. levees, dams can only gain credit if clearly linked to sustainability. Wing dykes are sustainable. Located examples not required but expect accounts of Kissimmee, Cole, Skerne, Rhine etc.
Level	Mark	Descriptor
Level 1	1-4	Descriptive. Basic ideas about sustainable river management. Lacks examples.
Level 2	5-8	Good account of sustainable river management. May focus on one strategy only. Examples lack depth and detail at lower end.
Level 3	9-10	Detailed examination of sustainable river management with confident use of terminology

(Total 30 marks)

Question Number	Answer	Mark
2(a)(i)	**Channel:** Meander, wide, point bar/ slip off slope visible on left, shallow water with braiding/islands/eyots, riffles, chute **Valley:** gently sloping, floodplain, variety of land use including vegetation 4x1 mark. 3 max for either channel or valley. No transfer between headings.	**(4)**

Question Number	Answer	Mark
2(a)(ii)	Likely to choose meander, or floodplain. Question asks for an explanation so credit process on diagram or in text. • Meander: thalweg moves from side to side within channel, and corkscrews in cross section (helicoidal flow), which increases meander amplitude. • Point bar builds up on inside of bend where water is slower, undercutting on outside increase river cliff and causes migration. • May choose minor features. 4x1 mark for a logical sequence. Max 2 if process not mentioned.	**(4)**

Question Number		
2(a)(iii)		**During flood:** Velocity and discharge will increase causing increase in competence. Higher calibre load will be transported by traction, may be picked up from riverbed. Wetted perimeter increases, friction increases as water flows over floodplain so deposition, of load. Bank erosion on outside of meander. **After flood:** higher calibre load will be deposited in channel. Braided sections will have changed in profile, quality of water will be temporarily reduced, meander may have migrated etc N.B. Ox bow lake not likely to develop with river in present form
Level	Mark	Descriptor
Level 1	1-2	Descriptive account of changes. Limited or no reference to process or flood. Basic ideas.
Level 2	3-4	Some changes described. Begins to explain/ exemplify. May be unbalanced(ie only writes about during flood) or have limited range.
Level 3	5	Variety of changes identified and explained/ exemplified. Clear linkage between process and features. Confident use of terminology.

Question Number	Answer	Mark
2(b)(i)	2 x 1 mark. 1 mark for basic identification of flood issue, i.e. unsafe to build on flood plain, danger of houses being destroyed etc. Second mark for explanation or development - pressure for more houses, dense housing properties, shortage of land, cheaper land, cheaper houses for first time buyers, possible to overcome problems by building on stilts, difficulty of insurance, danger of subsidence, weak foundations etc.	**(2)**

Question Number		
2(b)(ii)		• Flooding can lead to danger of losing life and property • Destruction of buildings, crops, • Drainage difficulties • Interrupts economy and transport. • Higher insurance required/may be difficult to obtain insurance in UK now. New building often on flood plain due to pressure on remaining land. Changes to hydrological cycle and flood risk if land is urbanised. • Increased risk to farmers attracted by nutrient rich soil e.g. Bangladesh • Changes to ecosystems • Health hazards e.g. malaria
Level	Mark	Descriptor
Level 1	1-2	Descriptive account restricted to houses being flooded. Basic ideas.
Level 2	3-4	Some issues described. Begins to explain. May have limited range.
Level 3	5	Range of issues explained. Uses terminology.

Question Number		
2(c)		**Valley cross profiles :f**actors include mass movement, climate (linked to mass movement), geology, human action/ management such as deforestation, channelisation and dams, glaciation, base level change, change in energy of river to erode valley by vertical down cutting or lateral erosion. **Long profiles: f**actors include changing discharge, geology, presence of waterfalls or lakes, rejuvenation or base level change, human action such as dams.
Level	Mark	Descriptor
Level 1	1-4	Descriptive, little or no use of examples/ factors or relevant terminology.
Level 2	5-8	Some understanding of a limited range of factors. May concentrate on one factor. Tends to be descriptive. Max 6 for very good explanation of CHANNEL profile.
Level 3	9-10	Structured examination of factors leading to variations. Clear understanding of reasons for differences at more than one location. Competent use of information and terminology such as knickpoint and base level.

(Total 30 marks)

Question Number	Answer	Mark
3(a)(i)	NB: The focus of this question is on HOW not WHY discharge changes downstream • Discharge increase from source to mouth • Presence of dams likely to reduce discharge downstream, regulate flow etc • Extraction by cities/for irrigation reduces discharge • Arid climate may reduce discharge • Discharge likely to increase below tributaries. 3x1 mark. Credit use of map evidence/ development to 2 marks	**(3)**

Question Number		
3(a)(ii)		• Rivers run through Turkey, Syria, Iraq Kuwait, Iran. • Dams upstream will deprive people downstream due to regulated/reduced flow. • International agreements required for share of water • increasing population will cause greater demand for water for domestic use, HEP and irrigation. • Near to mouth is the confluence of both rivers- who is responsible for reduced flow? • Environmental consequences if river is not managed properly e.g. loss of wetlands downstream clear water erosion etc. May refer to Colorado.
Level	Mark	Descriptor
Level 1	1	Basic ideas only.
Level 2	2-3	Some ideas described. Begins to explain but may focus on one idea only.
Level 3	4	Variety of ideas identified and explained. Clear understanding of international aspect.

Question Number	Answer	Mark
3(b)(i)	NB: This question MUST be marked with reference to figure 3b. • Amount of permanent marsh reduces by about 80%, • seasonal marsh gone altogether, • permanent lakes reduced esp. in Central marshes, • Central marshes changed from permanent marsh to dead or dry vegetation. • Shallow or seasonal lakes only exist in northeast in 2000. 4x 1 mark or 2x2 marks for developed points/ locational evidence	**(4)**

Question Number	Answer	Mark
3(b)(ii)	• Draining marshes and upstream damming have reduced water supply to marshes. • May be due to population increase in area which has created a demand for more land-industrial/urban/ agricultural therefore draining taken place. • May be increase in water abstraction. • May be hard engineering to create more land for agriculture, canals, and irrigation channels. • Political reasons e.g destruction of marsh Arabs • Climate change leads to changes in precipitation and rates of evaporation War/ pollution not acceptable unless clearly qualified 4x1 mark or developed points up to max 2 marks.	**(4)**

Question Number		
3(b)(iii)		Environmental/ecological benefit –aesthetics, wildlife havens for rare plants and birds, feeding grounds etc due to high productivity, use of natural defence against river floods, wash lands , pollution control ,source of fuel-peat etc. Economic benefits-tourism, reeds**,** fertile farmland/grazing
Level	Mark	Descriptor
Level 1	1-2	Basic ideas only e.g. good for wildlife.
Level 2	3-4	Some reasons described. Begins to explain. May focus on one aspect only.
Level 3	5	Variety of reasons identified and explained. Clear understanding demonstrated

Question Number		
3(c)		• This is an ecosystem question about the reasons for/ need for management rather than methods of management • Expect reference to sand dunes, salt marshes and coral. Located examples not required but expect Studland, Ban Don Bay etc. Must be a coastal ecosystem. Everglades or stretch of coast with no reference to ecosystem not acceptable. Accept Norfolk broads if reference to salt marsh.
Level	Mark	Descriptor
Level 1	1-4	Descriptive, little or no link to a particular ecosystem. Tends to identify general pressures.
Level 2	5-8	Good account which explore some reasons for management, or identifies specific threats. Linked to chosen ecosystem. Examples lack range or detail at lower end.
Level 3	9-10	Structured examination linking the need for management to vegetation and/or ecosystem functioning. Clear linkage to one ecosystem. Uses information and terminology competently.

(Total 30 marks)

Question Number	Answer	Mark
4(a)(i)	Sea level fell during Ice Age (1) and has risen/is rising since Ice Age (1) 2x 1 mark	**(2)**

Question Number	Answer	Mark
4(a)(ii)	Glacial period - caused lower temperature leading to thermal contraction. Ice store held water on land. Post Ice Age - temperatures have risen causing melting of ice store so ocean store increases. Thermal expansion. 1 mark for basic idea of eustacy or reference to isostatic change, 2nd and 3rd mark for development/ appropriate terminology	**(3)**

Question Number		
4(a)(iii)		Chalk subject to corrosion as carbonic acid in seawater dissolves it. Abrasion/corrasion, hydraulic pressure, wave pounding etc. sub aerial processes also significant. Credit climate change if linked to storm damage.
Level	Mark	Descriptor
Level 1	1-2	Basic ideas e.g. the sea attacks the cliff and breaks it up.
Level 2	3-4	Some reasons described. Begins to explain. May focus on one or two processes only.
Level 3	5	Range of processes identified and explained. Clear link to chalk coastline. Good use of appropriate terminology.

Question Number	Answer	Mark
4(a)(iv)	Focus on how global warming contributes to erosion. Ignore impact of global warming. • Increase in storms so more wave energy • Shallow water may become more acidic due to higher CO2 levels in atmosphere • Increased frequency of storms/hurricanes/storm surges etc • Higher level of wave attack • Transgression-broader erosion front • Changing climate increases rates of weathering All these factors contribute to greater rates of coastal erosion. 4x1 mark or up to 2 for a developed point.	**(4)**

Question Number	Answer	Mark
4(b)(i)	Wave refraction occurs when wave approach a coastline at an oblique angle or coastline is irregular. Change in speed and distortion of the wave fronts. 1 for a basic answer (e.g. waves bend/ change/spread out) or 2 for a more comprehensive definition (linked to headlands or bays, varying amounts of energy etc)	**(2)**

Question Number		
4(b)(ii)		• Refraction reduces wave velocity. • Distributes wave energy along a stretch of coastline. • Concentrates wave energy on headlands so erosion occurs. • Deposition tends to occur in the bays as waves slow down due to friction
Level	Mark	Descriptor
Level 1	1	Basic idea only, e.g. erosion of headland because it sticks out.
Level 2	2-3	Describes erosion of headland/deposition in bay and begins to explain. Links between wave erosion and headlands and constructive waves/friction/deposition and bay beaches will achieve 3 marks
Level 3	4	Erosion and deposition located and explained. Good use of appropriate terminology.

Question Number		
4(c)		**Deposition:** May discuss migration of barrier islands in US. e.g. Cape Hatteras, California. -expense of defences, threats to businesses as islands get narrower, but answer must be focused on deposition , not erosion. Can discuss growth of spits across estuaries, migration, dredging costs, etc. Habitat creation, coastal protection, tourist impact also valid. **Harder topic of two!** **Flooding:**Effect of storms/ hurricanes likely to get worse as global warming increases, but also due to increase in coastal population so flood risk higher. Likely to give examples such as Towyn, -railway line flooded disrupting travel and economy, homes evacuated, mainly elderly people affected, holiday camps ruined, power supplies and services affected. Implications for insurance costs. Could go for Maldives, Tuvalu, etc - environmental refugees, salt water inundation, agric losses, tourism collapse, submergence. May refer to Cyclone Nargis, Asian Tsunami if coastal, New Orleans if linked to storm surge, managed coastal retreat strategies No credit for riverine flooding (Dhaka /Boscastle). Must be clearly coastal e.g Sundarbans, Bay of Bengal.
Level	Mark	Descriptor
Level 1	1-4	Descriptive, little or no use of examples or relevant terminology.
Level 2	5-8	Good account which explores some impacts. Examples lack depth and detail at lower end. Not well linked to peoples lives at lower end.
Level 3	9-10	Structured examination linking chosen aspect to people's lives. Uses information and terminology competently.

(Total 30 marks)

Question Number	Answer	Mark
5(a)(i)	Berm/storm beach/ridge = 1 mark	**(1)**

Question Number	Answer	Mark
5(a)(ii)	Semi permanent ridge found at level of highest spring tide (1). High winds and spring tide (1) push coarse material (1) up the beach (1) beyond reach of normal high tide. Only added to by violent storms (1). Backwash percolates leaving large particles and debris behind (1). Some description inevitable but point mark for explanation to max 3. Candidate may have got feature wrong in 5ai. Do not double penalise. If feature is plausible e .g sand dune, raised beach, fossil beach, cliff slumping give credit to max 2.	**(3)**

Question Number	Answer	Mark
5(a)(iii)	• Recognition that system involves various elements e.g. inputs, outputs, procasses • Input of sediment from cliffs (mass movement, sub-aerial processes), offshore banks, rivers, • Transfers via longshore drift, • Store on beach itself • Outputs via wind erosion, marine erosion. NB: Systems terminology not required, but award 1 mark for each aspect.	**(4)**

Question Number	Answer	Mark
5 (b)(i)	Groynes Sea wall 2x1 mark	**(2)**

Question Number	Answer	Mark
5 (b)(ii)	High value land use needs hard engineering +details of cost benefit analysis Sea wall and groynes probably has been there a long time (traditional), protected areas of buildings. Sea wall and groynes protect settlement and build beach to reduce wave energy. New housing set back behind area of sports field. Caravan park low value so can be moved. No need to have expensive structure to protect low value land. Groynes built to build up beach in tourist destination. 5x1 mark. Credit development to max 3 when strategy linked to location. RESERVE ONE MARK FOR HOLISTIC LOOK AT COASTLINE.	**(5)**

Question Number		
5 (b)(iii)		• If erosion increases, homeowners may put pressure on council for more defences, higher wall etc. • Expensive. Taxpayer will foot bill. • Homeowners are northern end may be vulnerable if cliffs erode. • May be pressure for tourist industry to increase size of beach if amenity value is reduced • May be opposition against replacing groynes-unsightly etc. • New homes not at risk at moment but may feel threatened. • Insurance premiums may increase if erosion a problem • Resale value of houses reduced? • May be support for managed retreat from area's residents rather than having to pay for more defences? • Conflict with other taxpayers. • May tackle need for SMPs or integrated management • Increased risk due to climate change • Increased demand for sustainable defences • Impact of schemes up and down drift
Level	Mark	Descriptor
Level 1	1-2	Basic ideas only e.g. residents might be cross if houses fall into the sea (Sue Earle's plight)/groynes stop sand.
Level 2	3-4	Issues described and begins to explain. May only focus on one issue
Level 3	5	Clearly explains more than one management issue on this coastline. Credit range or depth.

Question Number		
5(c)		• Range of possible examples here. • Expect rapid coastal erosion and attempts to deal with it (Holderness), • managed retreat (Essex) , • Coral reefs/sand dunes could also be tackled. • Expect tales of poor management and what should have been done differently. • Candidates may look at individual locations or the coastline as a whole. Sediment cells etc will probably feature in the best answers.
Level	Mark	Descriptor
Level 1	1-4	Descriptive, little or no use of examples or relevant terminology. No idea of system.
Level 2	5-8	Account which explore some reasons for management. Usually linked to chosen coast. Examples lack depth and detail at lower end. Some link to system. Descriptive account of coastal management=max 6
Level 3	9-10	Structured examination linking aspects of management to the coastal system Clear linkage to one coastline. Uses information and systems terminology.

(Total 30 marks)