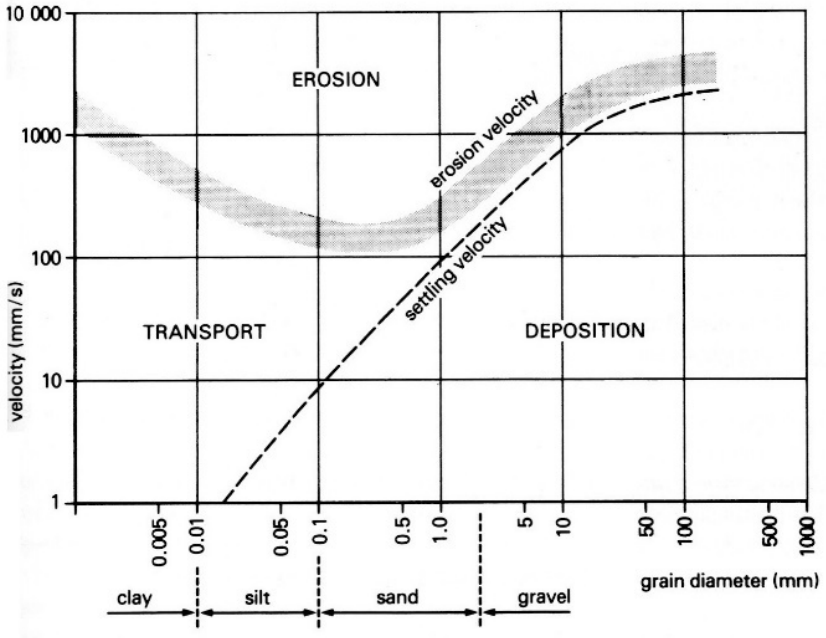
RIVERS

EROSION, TRANSPORT AND DEPOSITION

(a) Describe the four forms of erosion.
(b) What differences in methods of erosion would you expect in river channels composed of:
(i) limestone
(ii) boulder clay (till)
(iii) gravel
(c) What are the three methods of transporting eroded material?
(d) What is the critical erosion velocity?
(e) What groups of people would find the diagram below useful and what might some of the possible uses be?

The relationship between particle size and velocity to erosion, tranportation and deposition



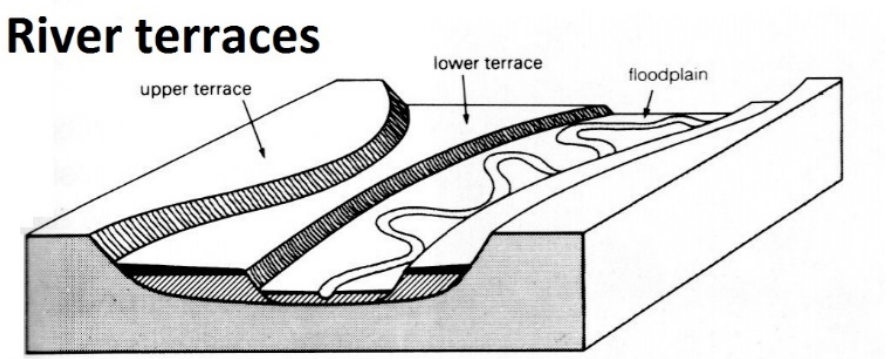
(f) Complete the following table using the diagram above to help you.

Grain size	River velocity	What will happen? (erosion, transport or deposition)
1.0 mm	10 mm/s	
10 mm	100 mm/s	
0.01 mm	100 mm/s	
0.05 mm	1000 mm/s	
0.1 mm	10 mm/s	

(g) Describe conditions which result in sorted sediments.

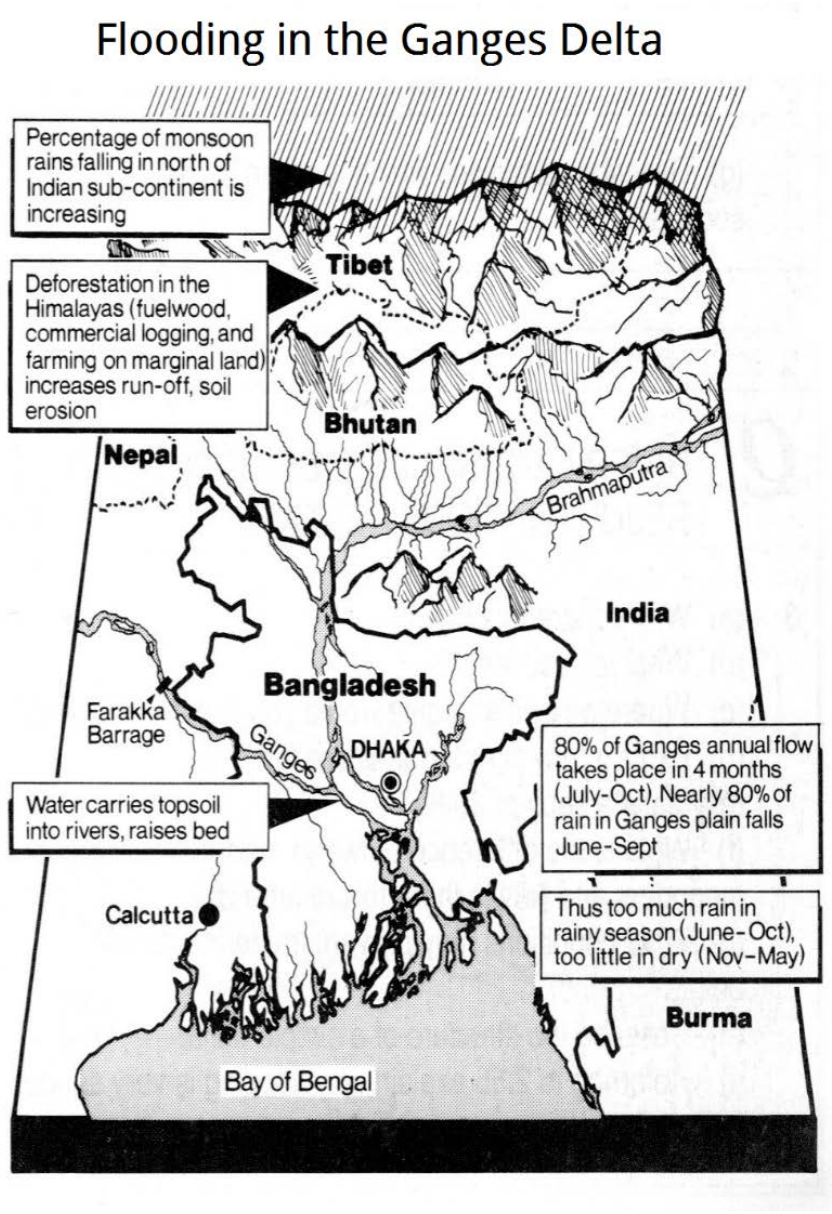
RIVER LANDSCAPES: BRAIDING AND REJUVENATION / DELTAS

(a) Why do streams braid?
(b) What is base level?
(c) Where on a river profile would you find a knickpoint?
(d) Explain how river terraces are formed.
(e) Make a copy of the diagram below.



River terraces. Rejuvenation can result in a river eroding into the floodplain and forming a new one at a lower level, remnants of the old floodplain are called terraces.

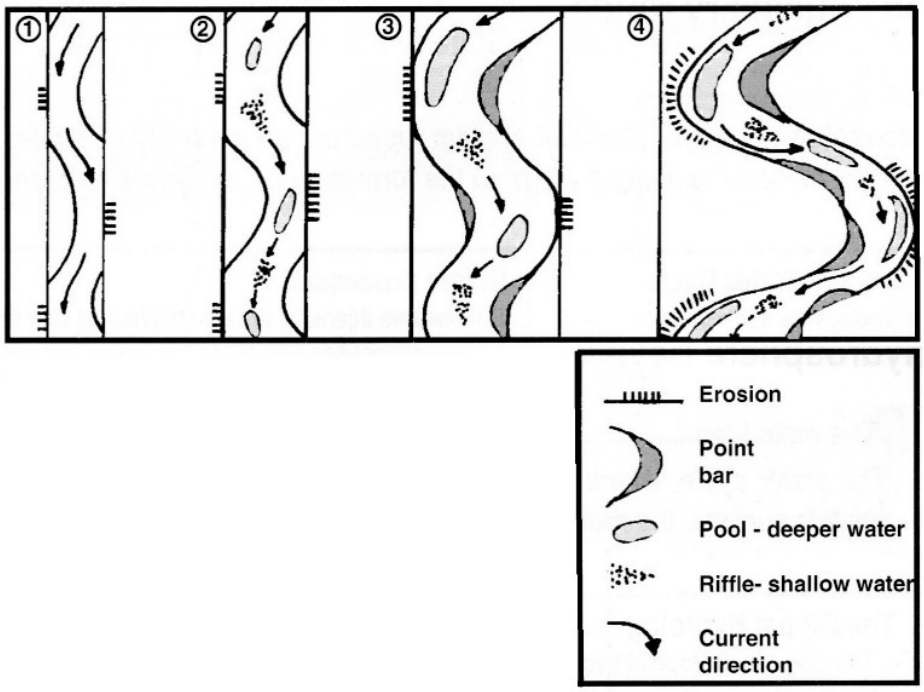
(f) What is the difference between incised and ingrown meanders and why is there this difference?
(g) What conditions may prevent the formation of deltas?
(h) Describe the structure of a simple delta.
(i) Referring to the diagram below explain why flooding is very serious in Bangladesh.



RIVER LANDSCAPES: VALLEYS / MEANDERS

(a) Describe the formation of a V-shaped valley.
(b) What is alluvium?
(c) Draw a series of diagrams to illustrate the formation of levees.
(d) Make a copy of the diagram below.

Stages in meander development



(e) Draw a diagram of a meander and indicate the places where active erosion and deposition take place.
(f) Describe the development of a meander from straight channel to ox-bow lake.
(g) Why do meanders migrate downstream?
(h) Construct a simple systems diagram for a river floodplain.

Research and Further work

(a) Using an atlas estimate the size of the following drainage basins: Amazon, Nile, Mississippi, Thames, Rhine.

(b) What differences in stream velocity would you expect between an artificial (concrete-lined) channel and a natural channel?

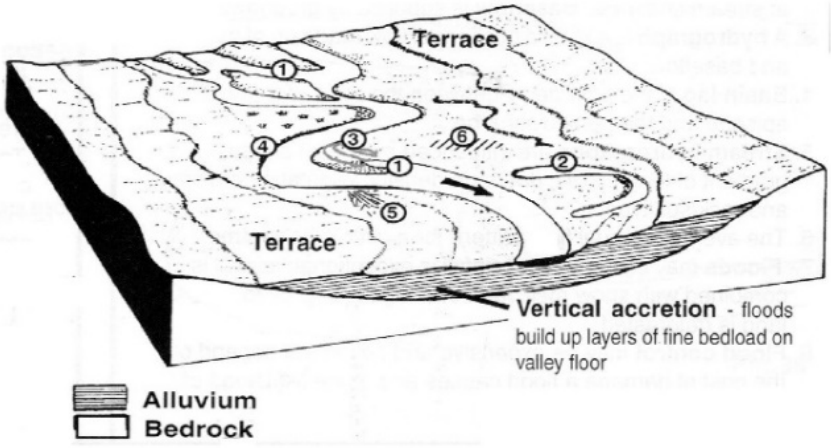
(c) Find out how gorges and waterfalls are formed and use diagrams to explain their formation.

(d) Find out the main uses of water (other than domestic use) in the UK.

(e) Refer to a geology map of the UK and identify areas which might use groundwater as a major source of water supply.

Exam Style Questions

1 a) Select one of the labelled features on the diagram below and describe the processes by which it was formed. (5)



Floodplain landforms and depositional environments

b) With reference to a named example describe two ways in which a river valley has been modified to reduce the likelihood of flooding. (4)

2 (a) Describe the ways in which weathering and erosion have created the landscape in the diagram above.

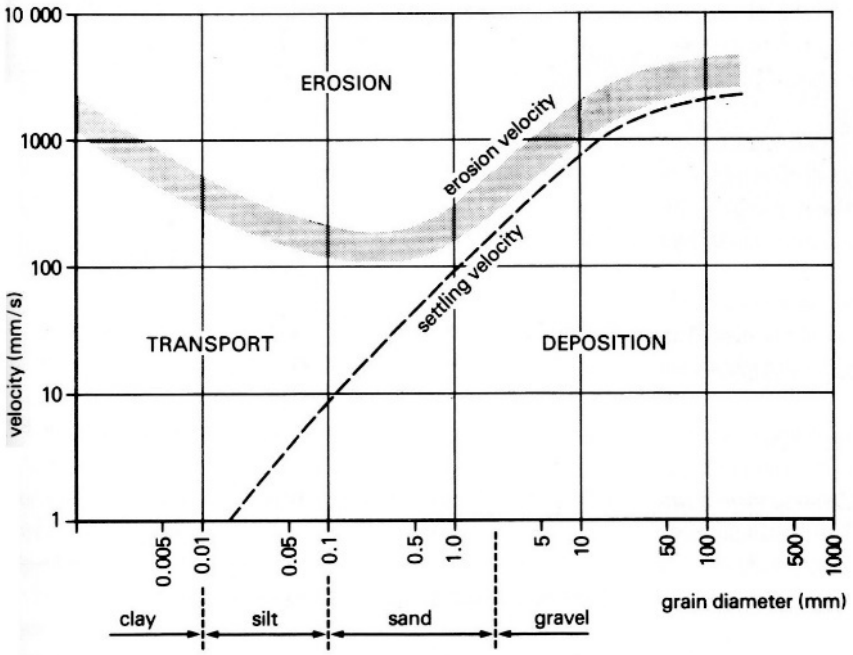
(6)

(b) What is meant by the term rejuvenation and what features might you expect to see in this landscape if it was rejuvenated?

(3)

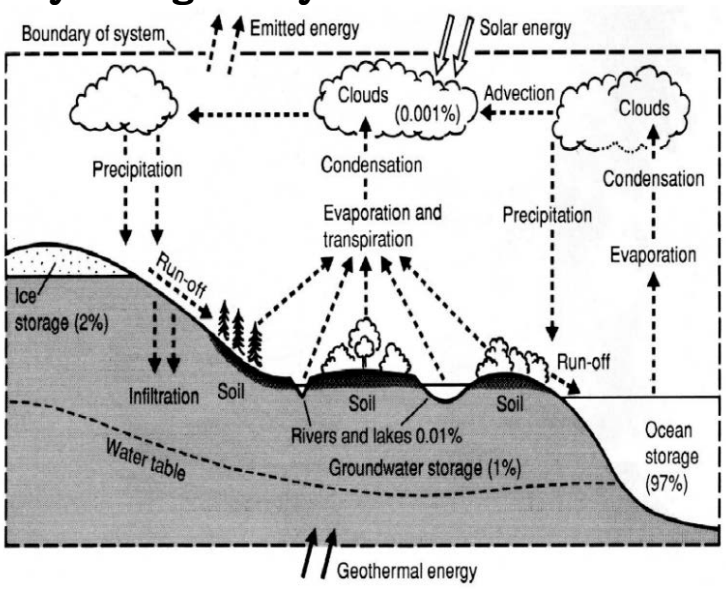
3 (a) Examine the diagram which illustrates the effect of river velocity on erosion, transport and deposition. Describe briefly the relationship between river velocity on erosion, transport and deposition of different material sizes. (6)

The relationship between particle size and velocity to erosion, tranportation and deposition



(b) Explain how the graph may be of value to hydrologists and engineers concerned with maintaining and controlling river channels and banks. (3)

4(a) With the aid of the diagram explain what is meant by the term the **hydrological cycle**. (5)



The Global Hydrological Cycle.
most water is held in storage with 97% in ocean storage and 2% as ice

(b) How does human activity modify the natural hydrological cycle? (4)

5 (a) 'Water in the UK is in abundance where it is least required.' Explain the uneven distribution of water resources in the UK and indicate how this situation is being tackled.
(5)

(b) Account for the increasing demand for water in the UK.
(4)

6(a) For any dam you have studied in Africa, Asia or North America describe and explain the physical factors which should be considered when selecting the site for the dam and its reservoir. (10)

(b) Describe and account for the social, economic and environmental benefits and adverse consequences of any named water management project. (12)

Exam Style Question and Marked Answer

A drainage basin is an open system with four elements – inputs, storage, transfers and outputs.' Discuss the movement of water within a drainage basin. (4)

The inputs in a drainage basin are , precipitation mainly in the form of rainfall and snow, with the amount and duration having an impact on the level of water in the system✓ Water is in storage, on the surface in lakes and rivers and interception by leaves and roots of vegetation✓ Water also seeps into the ground, stored as soil moisture in the upper layers or deeper down in rock stores such as the water table✓ Transfers include the movement of clouds bearing moisture by the process of advection✓ and surface run-off as sheet wash or rivers/tributaries, throughfall and/or stemflow, is responsible for the transferal of precipitation from the canopy to the soil✓ Infiltration and/or percolation moves water through the soil/rock.✓ Throughflow is the movement of water through the upper soil layers towards

the river, with the much slower groundwater flow taking longer to enter the river ✓ Outputs are, evaporation, transpiration from vegetation and surface run-off from rivers into seas and oceans ✓