

Answer ALL the questions. Write your answers in the spaces provided.

1. (a) Study Figure 1 in the Resource Booklet. It gives information about the Mississippi River.

(i) The terms **sediment** and **discharge** of a river have different meanings. Look at the meanings **A**, **B**, **C** and **D** in the table below.

A	The speed of a river
B	The amount of water flowing in a river
C	The mud and sand transported by a river
D	The industrial waste polluting a river

Put a cross in the correct box for each sentence below.

The meaning of river **sediment** is **A** **B** **C** **D**

The meaning of river **discharge** is **A** **B** **C** **D**

(2)

(ii) The sea gets much less sediment from the Mississippi drainage basin now than it did in 1940. Explain why. Put a cross in the correct box.

Canals have been cut in the Mississippi delta for ships

Higher levees have been built along the Mississippi's channel

Many reservoirs have been built on the Mississippi's tributaries

Some meandering sections of the Mississippi have been straightened

(1)

(iii) The Mississippi River's discharge is smaller at Baton Rouge than at Vicksburg. Explain why.

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(1)

(b) The Mississippi River causes a problem for the sea fishing industry. Explain why.

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(2)

(Total 6 marks)

Q1



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2. (a) Study Photograph C. It is a satellite image of the Mississippi River Delta in 2001.

(i) Describe the shape of the Red River's channel. Put a cross in the correct box.

straight

meandering

(1)

(ii) In which general compass direction does the Atchafalaya River flow?

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(1)

(b) Look again at Photograph C. Three letters (R, S and T) are shown on the photograph.

(i) Feature **R** is a landform.
Identify this type of landform.

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(1)

(ii) What can be seen at **S** and **T** in the photograph?
Write the letters **S** and **T** in the correct boxes in the table below.

	Letter
Algae	
Erosion	
Oilrigs	
Oil spill	
Sediment	
Storm surge	

(2)

Q2

(Total 5 marks)



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3. Study Figure 3 in the Resource Booklet.
It gives information about river management in the Mississippi drainage basin.

- (a) Choose **one** of the following hard engineering techniques.
- Straightening a river channel
 - Dredging a river channel

Explain how your chosen technique helps to manage **river flooding**.

Chosen Technique

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(2)

- (b) (i) Name a **soft** engineering technique used to manage river flooding in the Mississippi drainage basin. Use evidence from Figure 3 only.

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(1)

- (ii) **Explain** how this technique helps to manage river flooding.

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(2)

(Total 5 marks)

Q3



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4. Study Figure 4 in the Resource Booklet.
It gives information about the Mississippi River Delta.

(a) Coastal wetlands are a natural defence against hurricanes.
Explain how.

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(2)

(b) Erosion in the delta has been increased by:

- stone jetties blocking longshore drift on barrier islands
- canals being cut through wetlands
- saltwater moving inland.

Choose **one** of these reasons and **explain** how it increases erosion.

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(3)

Q4

(Total 5 marks)



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5. Study Figure 5 in the Resource Booklet. It gives information about New Orleans.
Look at the relief cross-section.

(a) What is the height above sea level of Lake Pontchartrain's levee?

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(1)

(b) The **site** of New Orleans makes the city very vulnerable to flooding.
Explain how.

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(2)

(Total 3 marks)

Q5



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6. Study Photograph D in the Resource Booklet. It is a satellite image showing Hurricane Katrina and sea surface temperatures on 27 August 2005.

(a) (i) Describe the **appearance** of Hurricane Katrina on 27 August. Use evidence from Photograph D only.

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(3)

(ii) What was the strength of Hurricane Katrina when the photograph was taken? Use evidence from Figure 6 and also Photograph D. Put a cross in the correct box.

Category 1 Category 2 Category 3 Category 4 Category 5

(1)

(b) The sea surface temperatures shown in Photograph D help us understand why a hurricane developed there. Explain how.

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(2)

Q6

(Total 6 marks)



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7. Study Figure 6 in the Resource Booklet.
It shows the track of Katrina from 23 to 30 August 2005.

Describe the **main** changes in Katrina's **location** during that period.

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Q7

(Total 4 marks)

8. Study Figure 7 in the Resource Booklet. It gives information about Katrina hitting New Orleans.

Look at the statements below about the flooding in New Orleans.
Put a cross in the boxes for the **correct** statements in the table below.

Rain from Katrina was the main cause of flooding	<input type="checkbox"/>
Storm surges entered the city	<input type="checkbox"/>
The Mississippi River overflowed its banks	<input type="checkbox"/>
Some levees gave way and increased the flooding	<input type="checkbox"/>
85% of the city was flooded	<input type="checkbox"/>
All the land that flooded was below sea level	<input type="checkbox"/>
The worst floods were in parts of the city south of the river	<input type="checkbox"/>
The Superdome shelter was in an unflooded area	<input type="checkbox"/>
Some canal floodwalls were not fit-for-purpose	<input type="checkbox"/>

Q8

(Total 3 marks)



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9. Study Figure 8 in the Resource Booklet.
It gives information about the effects of Katrina on New Orleans.

(a) Many people **drowned** in the flood.

The flooding also caused **other** health hazards.

Explain two of the other health hazards. Use evidence from Figure 8.

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(2)

(b) Although only 67% of New Orleans' population were black, more (75%) of the residents in the flooded areas were black.

Suggest why such a high percentage of people living in the flooded areas were black. Use evidence **from Figure 5**.

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(2)

(Total 4 marks)

Q9



11. (a) There were four options for New Orleans after Hurricane Katrina:

- Option A – Rebuild the city and give Category 5 protection.**
- Option B – Rebuild the city and give Category 3 protection.**
- Option C – Partly rebuild the city and give Category 4 protection.**
- Option D – Partly rebuild the city and give Category 3 protection.
Also build a new port by the Atchafalaya.**

Figure 12 in the Resource Booklet gives more details about these options.

Option A is no longer available because it would cost the government too much. Therefore **you can now only choose from options B, C and D.**

Which **one** of these three options do you think would be best? Put a cross in the box next to your choice.

Option B **Option C** **Option D**

Explain why you have chosen this option **and** why you did **not** choose the other two.

(Do **not** write about Option A)

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