A aerial view of a small town

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**Coastal Environments**



**Edexcel iGCSE**

**Multiple-choice Questions**

**Physical Processes in Coastal Areas**

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1. What triggers physical activities in coastal zones?
2. Only waves
3. Only wind
4. Waves and wind
5. Waves, wind and natural processes such as mass movement and weathering.
6. What type of waves are primarily associated with calm weather conditions?
7. Destructive waves
8. Constructive waves
9. Both a and b
10. None of the above
11. Which wave type contributes to the growth of the coastline due to the build-up of beach material?
12. Destructive waves
13. Constructive waves
14. Neither a or b
15. Both a and b
16. Which of the following characterises a destructive wave?
17. Low in height and long in length
18. High in frequency with a strong backwash
19. Creates a gentle gradient on the beach
20. Adds materials to the coastline
21. What type of wave is often high (over 1 meter) and short in length?
22. Destructive waves
23. Constructive waves
24. Both a and b
25. None of the above
26. How does a constructive wave influence the beach profile?
27. It creates a steep gradient due to the removal of material
28. It creates a gentle gradient due to material deposition
29. It does not influence the beach profile
30. It causes the beach profile to fluctuate
31. Which type of coastal erosion occurs when the force of waves crashing against a cliff compresses air in cracks and crevices?
32. Hydraulic action
33. Abrasion
34. Attrition
35. Solution
36. Which coastal erosion process involves waves carrying sand, pebbles, and other sediment, striking the shoreline or cliffs?
37. Hydraulic action
38. Abrasion
39. Attrition
40. Solution
41. Which of the following processes reduces rocks and pebbles in size and makes them smoother due to continuous impacts?

1. Hydraulic action
2. Abrasion
3. Attrition
4. Solution
5. Which coastal transportation process involves larger particles being dragged along the seafloor?
6. Traction
7. Saltation
8. Suspension
9. Solution
10. What is the process by which smaller particles hop or bounce along the seafloor?
11. Traction
12. Saltation
13. Suspension
14. Solution
15. Which of the following is a factor that influences coastal deposition?
16. Increase in wave velocity
17. Limited availability of material
18. A coastline with a regular pattern
19. Decline in the energy or velocity of waves
20. Wave refraction is the bending of waves as they approach what type of coastline?
21. Uniform
22. Non-uniform
23. Both uniform and non-uniform
24. None of the above
25. What is the upward motion of water on the beach called?
26. Backwash
27. Swash
28. Longshore drift
29. Wave refraction
30. What type of weathering involves the physical disintegration of rocks without any change to their chemical composition?
31. Mechanical weathering
32. Biological weathering
33. Chemical weathering
34. None of the above
35. Which type of weathering involves the transformation of rocks due to chemical reactions?
36. Mechanical weathering
37. Biological weathering
38. Chemical weathering
39. None of the above
40. Oxidation is a process that involves which of the following elements?
41. Carbon
42. Hydrogen
43. Nitrogen
44. Oxygen
45. In which form of mass movement does a coherent block of material move along a distinct slip plane?
46. Soil creep
47. Sliding
48. Slumping
49. Rock falls
50. Slumping often occurs in coastal regions with which type of materials?
51. Sands
52. Clays
53. Gravels
54. Boulders
55. What is the slowest form of mass movement, occurring on gentle slopes?
56. Soil creep
57. Sliding
58. Slumping
59. Rock falls

**What factors influence coastal environments?**

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1. Which of the following types of rock creates rugged landscapes in coastal environments?
2. Limestone
3. Clay
4. Gravel
5. All of the above
6. What are the coastlines where geological strata run parallel to the shoreline known as?
7. Accordant coastlines
8. Discordant coastlines
9. Both a and b
10. None of the above
11. Where can you find accordant or Pacific-type coastlines?
12. East coast of England
13. Southwest coast of Ireland
14. Netherlands
15. Californian coastline, USA
16. Which country's coast is characterised by sand dunes and coastal flats due to rapid deposition?
17. England
18. USA
19. Ireland
20. Netherlands
21. What is the term for local land-level alterations relative to the sea?
22. Eustatic changes
23. Isostatic changes
24. Both a and b
25. None of the above
26. Which of the following human activities influence coastal zones?
27. Settlement and industry
28. Recreation and tourism
29. Energy development and transport
30. All of the above
31. What coastal features are associated with lowering sea levels?
32. Relict cliffs and raised beaches
33. Fjords and rias
34. Both a and b
35. None of the above
36. Which of the following ecosystems can contribute to the diversity of coastlines
37. Mangroves
38. Coral reefs
39. Sand dunes
40. All of the above
41. Which of the following types of rock results in low, flat landscapes in coastal environments?
42. Limestone
43. Sand
44. Gravel
45. Both b and c
46. Where can you find discordant or Atlantic-type coastlines?
47. East coast of England
48. Southwest coast of Ireland
49. Netherlands
50. Californian coastline, USA

**Landforms of Coastal Erosion**

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1. What causes the formation of headlands and bays along the coastline?
2. Difference in temperature of the sea.
3. Variation in wind speed.
4. Difference in resistance between various rock types.
5. Tidal movements.
6. What type of rocks usually form headlands?
7. Resistant rocks
8. Softer rocks
9. Less resistant rocks
10. None of the above
11. What process leads to the formation of cliffs?
12. Deposition
13. Transportation
14. Weathering and erosion
15. Upliftment
16. What is a wave-cut platform?
17. A flat, rocky surface left behind as the sea erodes cliffs.
18. A column of rock left after the top of an arch collapses.
19. A cave eroded through a headland.
20. None of the above
21. What coastal feature is formed through continuous erosion by waves on a headland?
22. Cave
23. Stack
24. Stump
25. Wave-cut platform
26. When a cave is eroded through a headland, what feature is formed?
27. Arch
28. Stack
29. Stump
30. Bay
31. What is a stack?
32. A column of rock left after the top of an arch collapses.
33. A steep rock face formed through the process of weathering and erosion.
34. A flat, rocky surface left behind as the sea erodes cliffs.
35. None of the above
36. Which feature comes last in the sequence: cave, arch, stack, stump?
37. Cave
38. Arch
39. Stack
40. Stump
41. What causes the collapse of a stack to leave a stump?
42. Deposition
43. Erosion at the base
44. The process of transportation
45. Upliftment
46. What does the sequential process of cave, arch, stack, and stump formation illustrate?
47. The power of depositional forces along the coast.
48. The influence of weather patterns on the coastline.
49. The power of erosional forces along the coast.
50. The impact of human activities on the coastline.

**Landforms of Coastal Deposition**

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1. What are the most common landforms found along the sea’s edge?
2. Bars
3. Spits
4. Beaches
5. Tombolos
6. What materials typically make up beaches?
7. Sand, pebbles, or gravel
8. Mud and silt
9. Limestone and granite
10. All of the above
11. How are spits formed?
12. By the action of tides and currents
13. By the action of wind and waves
14. By deposition of sediments transported by longshore drift
15. By volcanic activity
16. Why do spits often have a hooked or curved end?
17. Due to volcanic activity
18. Due to changes in wind and wave direction
19. Due to the pull of gravity
20. None of the above
21. What is a tombolo?
22. A spit connecting an island to the mainland or another island
23. A narrow piece of land that juts out into the sea from the coastline
24. A bar running parallel to the coast
25. None of the above
26. How is a tombolo formed?
27. By erosion of the coastline by waves
28. By volcanic activity
29. By deposition of sediment between the mainland and an island or between two islands
30. None of the above
31. What is a bar in the context of coastal landforms?
32. A feature running parallel to the coast, connecting two headlands and enclosing a body of water
33. A feature jutting out into the sea from the coastline
34. A beach composed of accumulated sediments
35. None of the above
36. How is a bar formed?
37. When a spit grows across a bay
38. When there is significant sediment deposition between two headlands
39. Both a and b
40. None of the above
41. What type of coastal feature often encloses a lagoon or bay?
42. Spit
43. Beach
44. Tombolo
45. Bar
46. What is the major process that leads to the formation of spits and bars?
47. Deposition of sediments transported by longshore drift
48. Erosion by wave action
49. Tectonic activity
50. None of the above

**Coastal Ecosystems**

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1. What underwater ecosystem is concentrated in the tropics, specifically in warm, shallow waters?
2. Sand dunes
3. Salt marshes
4. Coral reefs
5. Mangroves
6. Coral reefs require a certain salinity to grow. What is the range for this salinity?
7. 15-30 parts per thousand
8. 30-38 parts per thousand
9. 38-45 parts per thousand
10. 20-25 parts per thousand
11. Mangroves are found in what kind of areas?
12. Tropical and subtropical tidal areas
13. Temperate forested areas
14. Desert areas
15. Arctic tundra areas
16. What is the purpose of mangroves' specialized roots, known as pneumatophores?
17. To absorb sunlight
18. To cope with oxygen-poor muddy soil and frequent inundations
19. To attract pollinators
20. To trap prey
21. What natural barrier against sea level rise and storm surge can be found in many coastal areas worldwide?
22. Coral reefs
23. Salt marshes
24. Sand dunes
25. Mangroves
26. What type of vegetation typically dominates sand dunes?
27. Halophytic and xerophytic vegetation
28. Mesophytic vegetation
29. Hygrophytic vegetation
30. Psychrophilic vegetation
31. Salt marshes are primarily found in what regions?
32. Tropical regions
33. Arctic regions
34. Temperate regions
35. Desert regions
36. Where do salt marshes typically form?
37. In upper coastal intertidal zones between land and open saltwater
38. In lowland river deltas
39. In high mountain areas
40. In desert oases
41. What is the main characteristic of salt marsh vegetation?
42. They are halophytic and typically have deep roots
43. They are xerophytic and typically have shallow roots
44. They are mesophotic and typically have medium-depth roots
45. They are psychrophilic and typically have no roots
46. What percentage of the world's sea fish spawn, grow and breed in coral reefs?
47. 10%
48. 25%
49. 50%
50. 75%

**Abiotic and Biotic Characteristics of Sand Dunes**

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1. What does every ecosystem, including sand dunes, consist of?
2. Biotic elements only
3. Abiotic elements only
4. Both biotic and abiotic elements
5. Neither biotic nor abiotic elements
6. What three primary food chains are often observed within sand dunes?
7. Grazing, detritus, and subsurface pathways
8. Aquatic, terrestrial, and aerial pathways
9. Plant, animal, and human pathways
10. Predator, prey, and neutral pathways
11. What percentage of plant biomass in sand dune ecosystems is found above ground?
12. 5%
13. 10%
14. 30%
15. 50%
16. Which trees contribute significantly to the total biomass in a sand dune ecosystem
17. The smaller trees and shrubs towards the front of the dune
18. The larger trees and shrubs towards the rear of the dune
19. All trees and shrubs equally contribute
20. None of the trees and shrubs contribute
21. What happens when kelp washes ashore on sand dunes?
22. It is left to rot and decay
23. It is used by humans for food and medicinal purposes
24. It becomes food for dune animals
25. It is carried back to the sea by the wind
26. What are the nutrient inputs in sand dunes?
27. Rainwater and sand weathering
28. Dead animals and plants
29. Human waste
30. Sea water and fish waste
31. What is the largest nutrient store in sand dunes?
32. The sea water
33. The sand
34. The biomass
35. The air
36. Why are decay pathways minimal in sand dunes?
37. Because of high rainfall
38. Because of dry conditions and lower pH
39. Because of high temperatures
40. Because of high human activity
41. When does soil nutrient absorption peak in sand dunes?
42. In the spring
43. In the summer
44. In the fall
45. In the winter
46. What percentage of detritus in sand dune ecosystems is found above ground?
47. 1%
48. 3%
49. 5%
50. 10%

**What are the Threats to Coastal Ecosystems?**

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1. Which of the following is NOT a threat to coastal ecosystems?
2. Agriculture
3. Industrialisation
4. Deforestation
5. Wildlife conservation
6. What can cause physical damage to coral reefs?
7. Dredging
8. Quarrying
9. Destructive fishing practices
10. All of the above
11. Which of the following is a result of global climate change that affects coral reefs?
12. Coral bleaching
13. Ocean acidification
14. Increased seawater carbon dioxide levels
15. All of the above
16. What are some of the threats faced by mangroves?
17. Deforestation for wood and charcoal
18. Overfishing in adjacent areas
19. Temperature increases from nearby power plants
20. All of the above
21. Why are mangroves often removed?
22. They are potential breeding grounds for mosquitoes
23. They are considered unsightly
24. They take up too much space
25. They interfere with boating activities
26. Which of the following is a human activity that affects sand dunes?
27. Coastal development
28. Grazing
29. Introduction of non-native species
30. All of the above
31. What is one of the reasons why sand dunes are flattened?
32. To provide space for car parking
33. To create space for housing
34. To allow for better visibility of the coastline
35. To make space for farmin
36. Which of the following threatens salt marshes?
37. Eutrophication due to excess nitrogen and phosphorus
38. Heavy metal contamination from industries and vehicles
39. Pesticides and insecticides
40. All of the above
41. What can happen when roads divide salt marshes?
42. It can lead to an increase in biodiversity
43. It can lead to a decrease in biodiversity
44. It can lead to an increase in water salinity
45. It can lead to a decrease in water salinity
46. How can attempts to control mosquitoes affect salt marshes?
47. By increasing their biodiversity
48. By decreasing their biodiversity
49. By increasing their size
50. By decreasing their size

**Conflicts Between Different Coastal Land Users**

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1. Who might conflict with farmers in coastal areas due to the potential for increased rates of erosion downdrift of defences?
   * 1. Industrialists
     2. Fishers
     3. Environmentalists
     4. Tourists
2. Why might fishers and environmentalists conflict in coastal zones?
   * 1. Overfishing depletes fish stocks and harms marine ecosystems
     2. Fishing improves the health of marine ecosystems
     3. Fishers want more industrial activity in coastal zones
     4. Environmentalists want to encourage more fishing
3. Which group might conflict with residents due to potential pollution, habitat destruction, and aesthetic degradation?
   * 1. Farmers
     2. Fishers
     3. Industrialists
     4. Conservation groups
4. What might lead to conflicts between tourists and local residents in coastal areas?
   * 1. Tourists' desire for more industrial activity
     2. Overcrowding, littering, and increased pressure on local resources
     3. Tourists' desire for more farming activity
     4. Tourists' efforts to conserve coastal resources
5. What conflict could arise between business interests and conservation groups in coastal areas?
   * 1. Disagreement over the most lucrative businesses
     2. Business activities could harm the natural environment
     3. Conflict over how to best attract tourists
     4. Disagreement over the importance of local residents
6. What user groups conflict at Studland Beach?
   * 1. Tourists, locals, wildlife enthusiasts, and conservationists
     2. Industrialists, farmers, and fishers
     3. Conservation groups and local residents
     4. Business interests and fishers
7. How has human use impacted Studland Beach’s environment?
8. By decreasing litter
9. By improving local habitats
10. By causing soil erosion and disrupting local habitats
11. By reducing the number of visitors
12. What measures has the National Trust taken to manage Studland Beach?
13. Implementing farming activities
14. Encouraging industrial activity
15. Restricting vehicle access, improving facilities, and conducting awareness campaigns
16. Encouraging more tourists to visit
17. Why has the National Trust zoned certain areas of Studland Beach for specific activities?
18. To reduce the number of visitors
19. To increase revenue
20. To minimize conflicts between users
21. To encourage more farming activities
22. What is the ultimate goal of the initiatives implemented at Studland Beach by the National Trust?
23. To increase the number of tourists
24. To encourage industrial activity
25. To enable recreational use while protecting the environment and biodiversity
26. To increase profits

**What are the Causes of Coastal Flooding?**

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1. Which of the following is NOT a cause of coastal flooding?
   * 1. Storm surges
     2. Tsunamis
     3. Drought
     4. Climate change
2. What can cause the most severe coastal floods?
   * 1. High wind speeds alone
     2. Tsunamis alone
     3. A combination of storm surges, tsunamis, and climate change
     4. Storm surges alone
3. What triggers tsunamis?
   * 1. High wind speeds
     2. Submarine earthquakes
     3. Drought
     4. Climate change
4. How does climate change contribute to the severity of coastal flooding?
   * 1. By reducing the sea level
     2. By adding more energy to the atmosphere
     3. By causing more submarine earthquakes
     4. By reducing the speed of tsunamis
5. What is the focus of coastal flood predictions?
   * 1. Anticipating droughts
     2. Anticipating high-magnitude waves, high tides and/or storm surges
     3. Predicting the speed of tsunamis
     4. Monitoring low-magnitude waves
6. Why is providing much warning for tsunamis challenging?
   * 1. Because tsunamis originate closer to the shoreline
     2. Because of the speed of tsunamis
     3. Because tsunamis are triggered by submarine earthquakes
     4. Because tsunamis are not tracked by satellites
7. What is the primary objective of coastal flood engineering?
   * 1. To predict the occurrence of tsunamis
     2. To avert coastal erosion and flooding
     3. To increase the height of buildings
     4. To monitor tropical storms and monsoon rains
8. What are the two main strategies used in coastal flood engineering?
   * 1. Increasing the height of buildings and installing satellites
     2. Flood-proofing structures and reducing the sea level
     3. Raising the height of buildings and flood-proofing structures
     4. Predicting high-magnitude waves and reducing the speed of tsunamis
9. What is dry flood-proofing?
   * 1. It involves making a property impermeable to floodwaters
     2. It involves permitting partial flooding of buildings
     3. It refers to the raising of buildings
     4. It refers to the reinforcement of barriers
10. What is wet flood-proofing?
    * 1. It involves making a property impermeable to floodwaters
      2. It involves permitting partial flooding of buildings
      3. It refers to the raising of buildings
      4. It refers to the reinforcement of barriers

**Coastal Management Strategies**

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1. What is the main objective of Shoreline Management Plans (SMPs)?
   * 1. To prevent any erosion along the coastline
     2. To protect specific areas from erosion while allowing others to erode naturally
     3. To use only hard engineering techniques to safeguard coastlines
     4. To use only soft engineering techniques to safeguard coastlines
2. Integrated Coastal Zone Management (ICZM) aims to balance what aspects of coastal regions?
   * 1. Protection of coastline and its utilization by people and economy
     2. Human activity and marine areas
     3. Coastal and inland economies
     4. Economic interests and marine areas
3. What is one characteristic that makes ICZM unique in its approach to coastal management?
   * 1. It focuses only on land systems
     2. It considers the interdependence of marine and land systems
     3. It disregards human activity and focuses solely on economic interests
     4. It does not involve stakeholders in decision-making
4. What are some examples of hard engineering coastal management techniques?
   * 1. Mangrove forests and beach nourishment
     2. Groynes, sea walls, revetments, rock armour, and cliff drains
     3. Allowing the coastline to retreat naturally
     4. Managed retreat
5. What is a possible downside of constructing groynes as part of hard engineering coastal management?
   * 1. It can increase erosion further along the coast because sediment is trapped
     2. It leads to losing homes or farms to the sea
     3. It allows the coastline to retreat naturally
     4. It mitigates the impacts of tropical storms
6. What characterizes soft engineering in coastal management?
   * 1. It works against nature's processes
     2. It modifies natural processes to prevent coastal erosion
     3. It works in tandem with nature
     4. It only focuses on hard engineering techniques
7. Which of the following is NOT a method of soft engineering coastal management?
   * 1. Constructing sea walls
     2. Maintaining mangrove forests
     3. Beach nourishment
     4. Managed retreat
8. How does managed retreat function as a method of soft engineering.
   * 1. By allowing the coastline to retreat naturally
     2. By building sea walls to prevent erosion
     3. By trapping sediment to create a natural barrier against erosion
     4. By reinforcing the coast with rock armour
9. What could be a possible downside of the managed retreat approach?
   * 1. It might lead to losing homes or farms to the sea
     2. It could lead to seabed scouring
     3. It might cause an increase in erosion further along the coast
     4. It can modify natural processes causing harm to marine life
10. How does beach nourishment work to protect the coastline?
    * 1. By constructing groynes to trap sediment
      2. By building sea walls to block waves
      3. By enlarging a beach using sediment from other locations
      4. By allowing the coastline to retreat naturally

**Answers**

1. d
2. b.
3. b.
4. b.
5. a.
6. b.
7. a
8. b
9. c
10. a
11. b
12. d
13. b
14. b
15. a
16. c
17. d
18. b
19. b
20. a
21. a.
22. a.
23. d.
24. d.
25. b.
26. d.
27. a.
28. d.
29. d.
30. b.
31. c.
32. a.
33. c.
34. a.
35. a.
36. a.
37. a.
38. d.
39. b.
40. c.
41. c.
42. a.
43. c.
44. b.
45. a.
46. c.
47. a.
48. c.
49. d.
50. a.
51. c.
52. b.
53. a.
54. b.
55. c.
56. a.
57. c.
58. a.
59. a.
60. b.
61. c.
62. a.
63. c.
64. b.
65. c.
66. a.
67. c.
68. b.
69. b.
70. b.
71. d.
72. d.
73. d.
74. d.
75. a.
76. d.
77. a.
78. d.
79. b.
80. b.
81. c.
82. a.
83. c.
84. b.
85. b.
86. a.
87. c.
88. c.
89. c.
90. c.
91. c.
92. c.
93. b.
94. b.
95. b.
96. b.
97. b.
98. c.
99. a.
100. b.
101. b.
102. a.
103. b.
104. b.
105. a.
106. c.
107. a.
108. a.
109. a.
110. c.