Coastal management strategies *3.1.3.4* ANSWERS

Q1	*Match the terms with their coastal engineering definition*	
A	Wire baskets filled with rocks that are stacked along a cliff foot.	**Gabions**
B	Excavators moving sand from one place to another in the same section of beach	**Beach reprofiling**
C	Boulders of granite extending at right angles to the beach in a line and intended to capture sand and interrupt the power of waves	**Groynes**
D	Lorries removing sand from the end of a beach and transferring it back along to an upcoast section of beach	**Beach recycling**
E	Large concrete moulded shapes that are formed at the site requiring protection and stacked in an interconnecting matrix	**Tetrapods**
Beach reprofiling **Tetrapods** **Groynes** **Beach recycling** **Gabions**		

Q2	**Tick if these are examples of Hard or Soft engineering techniques**	**Hard eng.**	**Soft eng.**
A	Offshore reefs	✓	
B	Timber groynes	✓	
C	Living shorelines		✓
D	Rip rap	✓	
E	Granite boulder groynes	✓	
F	Gabions	✓	
G	Beach nourishment		✓

Q3	**Which of these statements accurately describes the way in which coastal management techniques function? Explain why some are false.**		
		True	***False***
A	Soft engineering is called this because it involves sand redistribution – rather than hard, solid rock.		✓
'Soft' refers to the way natural processes are modified rather than 'Hard' options intended to disrupt or interrupt natural systems. Nothing to do with the materials used.			
B	Revetments work by absorbing some wave energy and enabling beach build-up through swash but restricting loss by backwash.	✓	
C	Offshore reefs work by re-directing waves into the gaps between the reefs so they carry more sand to the beach in those places.		✓
Waves are likely to be generally destructive – that's why the area needs coastal protection. Reefs absorb wave energy and create calmer water behind where deposition is more likely to occur.			
D	Groynes are most effective where longshore (littoral) drift occurs along a coastline by leading to a wider and steeper gradient beach.	✓	
E	Beach nourishment is a natural redistribution of sediment store that takes place mainly at the end of stretch of coastal longshore drift.		✓
Beach nourishment is an 'artificial' (human) redistribution of sediment that transfers sediment from a stretch of net deposition to a stretch of net loss due to longshore drift. It speeds up natural processes that would do similar in the sub-cell over a prolonged period of time.			

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Q4	***Explain how groynes reduce coastal erosion where they are located, but increase it further down the coast, using the following systems concepts***
Inputs Sediment and energy are inputs into the wider sediment cell. The sediment comes from coastal erosion, mass movement of cliffs onto beaches and from offshore marine sediments. Longshore drift provides the energy to input these sediments into the location of the groynes at a sub-cell scale.	***Store*** The marine sediment is transferred from upcoast stores (usually beaches) by longshore drift to where it is intercepted by groynes. The wave energy decreases as they encounter groynes, causing sediment to be deposited and building up an increased store on the side of the groynes facing the prevailing waves.
Outputs The downcoast flow of sediment is interrupted by the groynes that, in effect, create a mini sub-cell. There is very little output of sediment from this zone so further down the coast, as wave energy increases again from the calmer groyne zone the sea has more erosive power but reduced beach-building capacity. Narrower beaches downcoast provide little frictional resistance to destructive waves that hit the cliff with enhanced erosive power.	***Sediment cell*** The larger sediment cell still contains the same amount of sediment as before the construction of groynes, it is just distributed more unevenly after their construction. Sediment is contained in an artificial store in front of groynes and beaches downcoast are depleted of this input. The sediment volume is unchanged, but its distribution has been artificially determined by human intervention.

Q5	***Identify the factors that are 'more' and 'less' likely to make an ICZM an effective form of coastal management. Two have been inserted already.***
Less effective: Unreliable and ineffective monitoring equipment for recording coastal conditions Untrained analysis of data and extraction of invalid, inaccurate and unreliable information Consultation with few stakeholders who have an impact on the coastal zone Ineffective plans that don't meet stakeholders' prime needs Policies seen as unfair, inconsistent and poorly justified Ineffective monitoring, policing and follow-up of policies and their transgression Lack of adaptability to new conditions/situations Lack of long term sustainability	
More effective: Reliable and effective monitoring equipment for recording coastal conditions Trained analysis of data and extraction of valid, accurate and reliable information Consultation with all stakeholders who have an impact on the coastal zone Effective plans that meet stakeholders' prime needs. Policies seen as fair, consistent and well justified Effective monitoring, policing and follow-up of policies and their transgression Adaptable to new conditions/situations Long term sustainability	