ANSWERS TO STUDY QUESTIONS CHAPTER 12

1. As glaciers grow, eustatic sea level lowers. As glaciers melt, eustatic sea level rises. Glaciation can produce local (non-eustatic) changes in sea level in glaciated areas due to isostatic adjustments. As glaciers grow, continents are depressed under the weight of the glaciers. When such areas experience glacial melting, they isostatically rebound to a higher position. Such adjustments do not affect non-glaciated areas.

2. When sea floor spreading rates increase, mid-ocean ridges become mid-ocean rises, sea water is displaced, and eustatic sea levels rise.

   Yes; active and translational margins tend to be emergent, whereas passive margins are submergent.

3. Soft and/or fractured rocks tend to erode quickly while hard rocks erode slowly, so coasts comprised of rocks that erode at different rates become more irregular. If the sea floor is not too steeply sloped, then eventually sand will accumulate in front of the soft rocks in the bays - protecting them from further erosion. Since refraction works to concentrate wave energy on points, the hard rocks on the points continue eroding and the coast will eventually straighten.

4.

FEATURE	PRIMARY	SECONDARY	EMERGENCE	SUBMERGENCE	EROSION	DEPOSITION
fjord	X			X	X	
drowned rivermouth	X			X	X	
delta	X					X
barrier island	can be	either				X
dune coast	X					X
lava coast	X					
cratered coast	X					
fault bay	X					
fault coast	X					
reef coast		X		X		X
sea cave		X	X		X	
sea arch		X	X		X	
sea stack		X	X		X	
sea cliff		X	X		X	
wave-cut platform		X	X		X	
marine terrace		X	X		X	
beach		X				X
sand spit		X				X
baymouth bar		X				X
tombolo		X				X

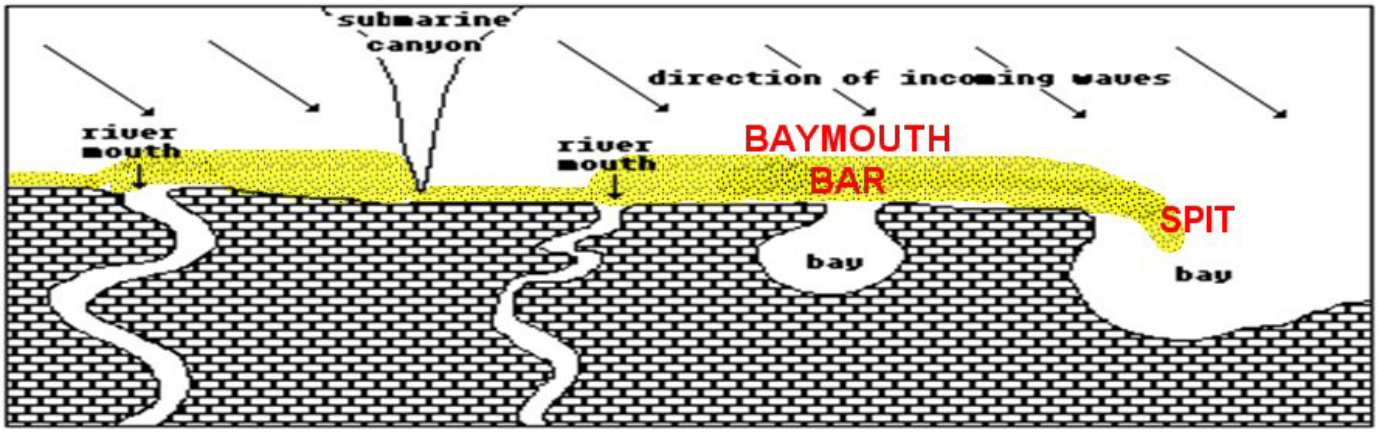
5. In most situations where the sea floor is not too steep, waves move sand ~~away from/~~towards the beach once they touch bottom. Once waves break they tend to move sand away from/~~towards~~ the beach. If the distance between where the waves touch bottom and break is large compared to the width of the surf zone, then net sand movement is generally ~~away from/~~towards the beach. If the distance between where the waves touch bottom and break is small compared to the width of the surf zone, then net sand movement tends to be away from/~~towards~~ the beach. Sand suspended within the turbulence of the surf zone will generally be deposited offshore as a longshore bar.

The waves which hit San Diego beaches in summer generally come from ~~nearby/~~distant storms and thus have

long/~~short~~ wavelengths, low/~~high~~ wave heights and are relatively ~~frequent~~/infrequent. Because of their wavelength, our summer waves will "touch-bottom" in relatively ~~shallow~~/deep water, however, because of their height, these waves will break in relatively shallow/~~deep~~ water. Hence the distance between where our summer waves touch bottom and break is ~~small~~/large compared to the width of the surf zone, net sand movement is ~~away from~~/towards the beach and our beaches ~~narrow~~/widen during summer. This process is enhanced by the infrequency of summer waves which keeps sand on the beach face ~~saturated~~/unsaturated and thereby ~~increases~~/decreases erosion by backwash.

Our winter waves generally come from nearby/~~distant~~ storms and thus have ~~long~~/short wavelengths, ~~low~~/high wave heights and are relatively frequent/~~infrequent~~. Because of their wavelength, winter waves will "touch-bottom" in relatively shallow/~~deep~~ water, however, because of their height, these waves will break in relatively ~~shallow~~/deep water. Hence the distance between where our winter waves touch bottom and break is small/~~large~~ compared to the width of the surf zone, net sand movement is away from/~~towards~~ the beach and our beaches narrow/~~widen~~ during winter. This process is enhanced by the high/low frequency of winter waves which keeps sand on the beach face saturated/~~unsaturated~~ and thereby increases/~~decreases~~ erosion by backwash.

7.



8. a. see red arrows in diagram below
b. _2_ jetty _3_ breakwater _1_ groin
c. __4,6,8__ erosion __5,7,9__ deposition
d. erosion
e. nothing, (as long as the waves keep coming from the same direction)