Quiz 5: Oceanic Ridges (Ch. 6)

1. A low-density region exists under the mid ocean ridges. What are the three geologic effects potentially responsible for reducing the density?

thermal expansion, partial melt, and phase changes.

2. How does the magma chamber under a fast spreading ridge differ from that under a slow or ultraslow spreading ridge?

Fast - magma chamber can exist continuously, thin melt sill only a km across and 10s m wide. large hot region around it is hot gabbro 5-10 km around magma chamber - low density and partial melt. Slow - magma chambers don't persist, only fill transiently when there is an influx of mantle melt.

3. How does sea water enter and alter the oceanic crust? Give two examples of structural settings where hydration occurs.

Structural deformation creates faults and fractures which act as conduits bringing water down to ultramafic rock. Settings could include: core complex development exposing ultramafics along low angle faults, high angle graben-bounding faults cutting down to ultramafics, bending stresses as plate flexes around bend can channel water downward. Could also mention seamount conduits, hydrothermal circulation at spreading ridge

4. Bouvet Island in the South Atlantic was originally thought to be a volcanic seamount associated with a plume. Recent discovery of sheared peridotite is evidence that in fact, Bouvet Island is the only exposure (above sea level) on present-day earth of *what*?

Transform fault or leaky transform