Review Questions Topic 11: Metamorphic Rocks

What is the definition of a metamorphic rock?

What is “normal stress” and what kind of deformation does it result in?

What is “shear stress”? How does this geometrically deform the grains?

Explain recrystallization, being mindful of whether the final chemical composition is the same as the protolith or not

Explain phase change, being mindful of whether the final chemical composition is the same as the protolith or not

How can polymorphs of minerals be used to determine temperatures and pressures experienced by a metamorphic rock?

Explain neocrystallization. How does it result in new minerals? What conditions must be met for neocrystalline metamorphic rocks to be of the SAME bulk composition of the protolith, OR differ from it?

Explain the low grade metamorphic change of “pressure solution”

What two pressure variables contribute to a rock forming a foliation?

Other than deformation of grains, what else contributes to the presence of aligned grains we call foliation?

Differentiate between slate, phyllite, schist, and gneiss in terms of metamorphic grade, final grain size, type of layering, and types of metamorphic change (neocrystallization, recrystallization, etc)

Are all non-foliated metamorphic rocks evidence of low pressure regimes during metamorphism? Why or why not?

What is the primary metamorphic change that takes place to create marble from limestone?

What two primary metamorphic changes take place to create a quartzite from a quartz sandstone?

What is a hornfels? Why can it have multiple protoliths? Explain

Can non-foliated and foliated metamorphic rocks form in the same area under the same conditions? Explain why or why not