Interpreting the Geologic History of the Grand Canyon

Based on the cross section of Grand Canyon on the next page answer the following:

1. What is the name of the oldest rock unit in the cross section? *Vishnu Schist*

2. Which is older, the Zoroaster granite or Grand Canyon supergroup? How do you know? *Zoraster granite since it doesn't cut G. C. supergroup.*

3. Number each of unconformities and label its type. *See next page.*

4. Looking at the unconformities which time periods are missing from each? How many years seem to be missing in total during these periods? *Missing Ordovician to Silurian and missing Pennsylvanian which amounts to many tens of millions of years.*

5. Based only on the evidence in the cross section, when did the Colorado river begin to carve the Grand Canyon? What might be the problem with this interpretation? It looks like there is no periods after Triassic so one might wrongly conclude that uplift and cutting occurred at the end of the Triassic. *The Laramide Orogeny that uplifted the Colorado Plateau was a later in the Cretaceous (65 million) and cutting of actual canyon occurred recently less than 6 million years ago.*

6. What kind of fossils might the limestone of Grand Canyon supergroup contain? *Before the Cambrian we might expect such things as algae (stromatolites).*

7. Tapeats Sandstone averages 525 million years old and is made of cliff-derived medium- to coarse-grained sand and conglomerate that was deposited along an ancient ocean shore. It contains some marine fossils. What fossils would you expect might be there? *This Cambrian rock body could contain such things as Trilobites.*

8. The Tonto Group contains the Tapeats, Bright Angel and Muav. Do these represent a time of transgression, regression, stable marine platform or continental deposition? Explain the evidence. *This is a fining up sequence hence represents a transgression of the sea.*

9. Which units would you study if you were a dinosaur paleontologist? *Cedar Mt. Group is Triassic when the first dinosaurs appeared.*

10. What is the first and last unit that might contain Trilobites? *Tapeats to Kaibab.*

11. Would you expect to find inclusions of the Vishnu in the Zoraster or visa versa? Explain your reasoning. *You should expect Vishnu inclusions in the Zoraster since the Vishnu is older.*

12. What inclusions might you find in the Tapeats? *You could have inclusions of Vishnu, Zoraster, Grand Canyon Supergroup since they are older.*

13. What kind of fault is shown in the “inner gorge?” *That is a reverse fault.* If was at a lower angle it would be called a thrust.
#1. Nonconformity

#2. Nonconformity

#3. Angular Unconformity

#4-6. Disconformity