Earth's Structures: Folds, Faults, and Fabrics – Chapter Questions

1. **Compare and contrast pressure, stress, shear, and strain.
2. **What are the three types of stress? (Use arrows to indicate the motion that causes each.)
3. A stressed rock can experience three kinds of deformation: elastic, brittle, or ductile (plastic). What conditions favor each? What are the results of each? (Answers in table below – be sure you understand!)

Deformation type	**Causes**	**Results**
Elastic – temporary deformation	Stress not greater than elastic limit of rock	Strain released and shape returns to normal
Brittle – permanent break	Stress greater than yield point or elastic limit of rock (usually <u>colder temperatures</u> – nearer surface – <u>rapid</u> stress application)	Strain released with break in rock (faulting)
Plastic – permanent ductile deformation	Stress greater than yield point or elastic limit of rock (usually <u>higher temperatures</u> – deeper underground – stress applied slowly over <u>long time</u>)	Strain is permanent (folding)

4. What is yield point or elastic limit? What does it mean?
5. **Compare and contrast anticlines and synclines. Domes and basins. Anticlines and domes.
6. Imagine the above structures were eroded to a flat top. If you were walking across these tops, where would you find the oldest rocks? Draw pictures of each and indicate oldest and youngest beds.
7. Describe a plunging fold. What does it look like when its top surface is eroded flat?
8. How can you tell the difference on the surface between a plunging syncline or anticline?
9. **Compare and contrast dip-slip and strike-slip faults.
10. Explain right-lateral and left-lateral strike-slip faults.
11. **Compare the movement of normal and reverse faults. What type of force produces each?
12. **Explain hanging wall and footwall.
13. Be able to label diagrams of faults with relative fault motion arrows, stress direction, fault name, and hanging wall and foot wall. (For right-and left-lateral strike-slip faults AND reverse and normal faults.)
14. **What kind of the fault is the San Andreas Fault?
15. Review this table. Be able to complete it, if blank, and ensure your understand why each box is true:

Mountain type	**Formed by**	**World examples**	**California examples**
Fold and Thrust	*Compressive stress (usually at convergent plate boundaries)*	*Himalayas*	*Transverse Mountain Range (Santa Barbara and eastward)*
Fault-Block	*Tensile stress (usually at divergent plate boundaries)*	*East African Rift Zone Basin and Range*	*Sierra Nevadas*
Domes	*Single point of pressure pushing up from inside Earth (salt dome rising or magma rising, but not erupting)*	*Adirondacks, Sheep Mountain*	*Mt. Diablo*
Erosional Remnant	*Resistant rock that sticks out from surroundings, because they eroded more quickly and easily*	*Devil's Tower, Wyoming*	*Twin Peaks*
Volcanic	*Volcanic activity associated with hotspot, divergent plate boundary, or subduction zone*	*Cascade Mountains, Andes Mountains*	*Mt. Shasta, Glass Mountain, Mammoth Mountain*

16. Review this table. Be able to complete it, if blank, and ensure your understand why each box is true:

Stress types	**Plate boundaries**	**Fault types**	**Crustal thickening or thinning or both/none?**	**Mountain types (if any)**
Compression	*Convergent*	*Reverse (+ thrust)*	*Thickening*	*Fold and Thrust*
Tension	*Divergent*	*Normal*	*Thinning*	*Fault-Block*
Shear	*Transform*	*Strike-slip*	*None*	*None*