

**Answer all questions in the space provided. If you have any questions, raise your hand. 100 points possible.**

**1 (6 pts)** I have said many times that the “Sun is the top 99 objects in the Solar system”. Obviously, the Sun is only one object. Explain what I meant by this statement.

**2 (6 pts)** We have never seen the deep interior of Jupiter, nor could probes survive a trip there. Explain how we know what the deep interior of Jupiter is like.

**3 (4 pts)** I said that Neptune’s moon Triton has surface that is about 300 million years old. This age determination was based on a lot of assumptions. If you *really* wanted to know the age of Triton’s surface, how would you determine it?

Astronomers have discovered about 30 planetary systems around other nearby stars. The main characteristic of these systems are Jupiter sized planets orbiting very close to the parent star.

4 (8 pts) Explain why we believe that these large planets did **not** form at their present location.

5 (8 pts) Explain why these types of planetary systems are the easiest to detect.

6 (5 pts) The Earth is geologically active today. Explain how the Earth generates its internal heat to drive this geological activity.

7 (5 pts) Rocks brought back by the Apollo mission showed that the Moon had a magnetic field 3.3 billion years ago. What was different about the Moon 3.3 billion year ago that allowed it to have a magnetic field?

8 (6 pts) One component you need to generate a magnetic field is a conducting medium. Match the world to its conducting medium. You can use a conducting medium for more than one answer.

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|-------------|------------------------|
| ___ Earth   |                        |
| ___ Neptune | A. "Metallic" Hydrogen |
| ___ Jupiter | B. Water/Rock "Ocean"  |
| ___ Mercury | C. Iron                |
| ___ Saturn  | D. Copper              |
| ___ Uranus  |                        |