May 2, 2013 – Spring 2013

TA's Name & Section (2 pts): _____

Answer all questions in the space provided. If you have any questions, raise your hand. 100 points possible. NO CALCULATORS OR ANY ELECTRONIC DEVICES.

1 (6 pts) What are the characteristics of the surface of a geologically simple world?

2 (6 pts) What are the characteristics of the surface of a geologically complex world?

3 (4 pts) What does a world's *Moment-of-Inertia* tell us about that world?

A weather report for a typical late spring day in Seattle would be something like:

Partly cloudy, winds 8 - 10 mph. High temperature of 63 F (17 C), low of 48 (9 C). Pressure 1026 mb (1 ATM = 1013 mb).

For the next two questions, write a weather forecast for a typical day on the surface of:

4 (6 pts) Mars (Northern hemisphere, Summer):

5 (6 pts) Venus (Anywhere, Anytime):

6 (4 pts) What is the source of the energy that drives the geological activity on the surface of the Earth?

7 (4 pts) Assume you have discovered a world with a density of 3.68 g/cm^3 . What is the most likely composition of this world?

8 (8 pts) You have discovered a world that has one-third (1/3) gravity as the Earth, but is 3 times as large. How would the **mass** of this world compare to the Earth's?



9 (6 pts) The drawing on the left is a cross-section of the interior of the Earth. In the space below, sketch and label a cross-section of the interior of the Moon, and of Mercury. (You should have two different sketches).

10 (8 pts) One of the key components of the *Greenhouse Effect* is that visible light gets converted to infrared (IR) light. Explain how this happens. You do NOT need to explain the entire *Greenhouse Effect*.

11 (8 pts) Explain why there is very little (really zero) metallic iron in the crust of the Earth.

12 (8 pts) The largest volcano on Mars, Olympus Mons, has an estimated age of about 100 million years \pm 50 million years. Explain why the age determination is not very accurate, and what you would need to make it very accurate.

13 (8 pts) I have said that the Mars Rovers found that the soil on Mars is "global later that local". Explain what this statement means and why this in not the case on the Moon.

For each of the surfaces pictured below, tell me: (1) The most likely rock type found on the surface, (2) The most probable age of the surface (I want a number with units), (3) How the age of the surface was determined, and (4) What processes are modifying the surface TODAY.



14 (8 pts) Apollo 16 landing site - Lunar Highlands

Rock Type: _____

Surface Age: _____

How surface age determined:

Processes modifying surface today:



15 (8 pts) Venera 8 landing site - Venus

Rock Type: _____

Surface Age: _____

How surface age determined:

Processes modifying surface today: