From the Big Bang to the Blue Planet

Fall 2008

Quiz #1 Overview

Quiz Date: Wednesday Oct. 15, 2008

Exam Time: 11:30 - 12:20

Location: OSB 425

- 20% of your grade in the class
- Format: Multiple choice & short answer
- Material to be Covered (aka 'stuff you should study'):
  - Lecture Notes #1 & #2
  - Class Discussions
  - Required Readings

SAMPLE QUESTIONS

1. What is the age of the universe?
   a. 1.3 billion years
   b. 4.55 billion years
   c. 13.7 billion years
   d. 96.1 billion years

2. What is the cause of the 3K Cosmic Microwave Background?
   a. Active star formation regions
   b. Dark nebulae
   c. The Big Bang
   d. Black Holes

3. What fraction of nuclear matter in the universe is hydrogen?
   a. < 2%
   b. 25%
   c. 73%
   d. 99%

4. If a star is stable, and not changing in size or temperature, then which equilibria must exist?
   a. Kinetic and centrifugal
   b. Hydrostatic and thermal
   c. Kinematic and adiabatic
   d. Thermodynamic and coriolis

5. The energy emitted by a star is:
   a. Inversely proportional to its temperature
   b. Proportional to its temperature
   c. Proportional to the 4^{th} power of its temperature
   d. Proportional the square of its temperature

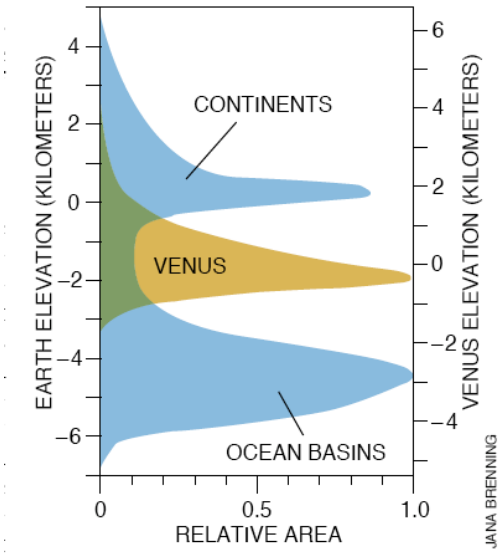
6. What type of star is the Sun?
   a. Red Giant
   b. White Dwarf
   c. Black Dwarf
   d. None of the above

7. What process produces elements with atomic masses greater than iron?
   a. Proton Capture
   b. Thermonuclear Fusion
   c. Thermonuclear Fission
   d. Neutrino Capture

8. Which of the following is least likely to influence the Habitable Zone around a star?
   a. The temperature of the star
   b. The lifetime of the star
   c. The star's emission of radiation at ultraviolet and shorter wavelengths
   d. The abundance of noble gases in the stellar nebula

Short Answer Questions

1. In the Figure below from Taylor & McLennan (1996) *Scientific American*, explain why the continents are at a higher elevation than the seafloor and why no such difference exists on Venus.



Answer: The oceanic crust is comprised of basalt which has a higher density than the continental crust which is comprised largely of granite. So the oceanic crust sinks deeper into the mantle. The surface of Venus appears to be all basalt. Thus plate tectonics & volcanism do not appear to be happening on Venus.