

ASTR 202 - EXAM 1 (10 Question, 6 pages)

Please write short answers in complete sentences directly below each question where applicable. You may use the back of the page if necessary (please indicate if you do so).

No notes or electronic devices are allowed.

Printed Name: _____ Student ID: _____

1. This class is based on the subject of astrobiology. What is astrobiology?

2. What is one of the principles (or hallmarks) of science (i.e. something that distinguishes science from faith or other ways of thinking)?

3. Explain why the study of an extraterrestrial origin of crop circles is pseudo-science. What reference/story can you cite?

4. Imagine that you overheard the following student comments during our in-class Astrology activity. Are any of the following statements valid? Critique each of them from the point of view of the application of statistics and the scientific method.

Student #1: If astrology does not work at all, then nobody should have picked the correct Star Sign.

(Question 4 continued on next page)

Student #2: If anybody at all got the correct Star Sign, it proves that astrology works some of the time.

Student #3: Statistics can't prove or disprove anything.

Student #4: The test would only have proved that astrology works if close to 100% of students had picked the correct Star Sign.

Student #5: The experiment was not a proper test, because astrology only works if you believe in it.

5. What did Copernicus do and why was it revolutionary?

6. Give one example of an observation Galileo made with his telescope and what his observations helped prove/disprove.

7. Assume the scale model of the solar system we made in class where the Earth was a 6cm ball and the distance between the Earth and the Sun was roughly the length of the UofA mall. Approximately how long would it take you to walk to the nearest star if you were walking at the pace of the speed of light in the model (Proxima Centauri, the nearest star, is located 4.2 lightyears away from the Sun)? (Note: you do not need a calculator to do this problem!)

8. Put the following in increasing order of size, **from smallest to largest** – Virgo Cluster, Sun, Local Group, Milky Way, Earth, Jupiter, the Moon, our Solar System, Mars, you.

9. In a time scale model where the Big Bang to present day is one calendar year and the Big Bang was on Jan 1, on what day of the calendar year do humans (homo sapiens) first appear?

10. Describe and explain in complete sentences two pieces of scientific evidence that the Universe existed in a hot, dense state (The Big Band Theory) early in its history.