Shoreline
COMMUNITY COLLEGE

Introduction to Astronomy (ASTR& 101)

Spring 2016

Homework 7 Due Monday May 23

(1) If Astronomers discovered the most distant galaxy ever observed, what would they notice about its spectra and speed?

(2) As measured in a laboratory on Earth, the "K" line of calcium has a wavelength of

$$\lambda_o = 403.1\,nm$$

But the spectrum of a distant galaxy show the wavelength of this line at

$$\lambda = 403.3\,nm$$

What is the value of the redshift for this galaxy?

(3) If a galaxy has a measured recession speed of 5,200 km/s, how far away is the galaxy in light years?

(4) Where is the center of our universe?

(a) the Earth is at the center

(b) the center is somewhere near the Virgo supercluster

(c) the center is somewhere within the Hydra-Centaurus supercluster

(d) there is no center to the universe

(5) According to Olber's paradox, the fact that the night sky is dark tells us that our observable universe:

(a) homogenous and isotropic

(b) static and infinite

(c) has not been here forever

(d) unique

(6) What would the universe look like to an astronomer living in a galaxy several billion light years away? (Hint: explain why the universe would or would not look essentially the same as it would look to us).

(7) How do we know that we are moving through the Cosmic Microwave Background (CMB)?

(8) The Cosmic Microwave Background (CMG)

(a) was predicted by the Big Bang Theory

(b) came from the early universie before protons and neutrons formed

(c) shows large fluctuations from different densities in the early universe

(d) Shows that we are at the center of the universe

(9) Which of the following is evidence supporting the Big Bang Theory

(a) the Earth is orbiting in the habitable zone of our star

(b) the existence of the Cosmic Microwave Background

(c) our star is halfway through its life on the main sequence

(d) all of the above

(e) none of the above

(10) If the value for the Hubble constant was smaller than we have been given then the calculated age of the universe would be:

(a) older

(b) younger

(c) the same

(d) we need more information to make the determination