

PMU199Y Quiz #10
22 March 2018

Circle the most correct answer. Your name: _____

1. **Peebles and Rastra note that the “empirical evidence for cosmology is not nearly as strong as for the Standard Model of particle physics.” Why?**
 - a. Particle physics has been tested to very high precision.
 - b. One can look at distance objects but never touch them.
 - c. Astronomy is complicated and what can be observed is sparse.
 - d. All of the above.
2. **They go on to describe the possible contributions to the energy density of the universe. What do they conclude?**
 - a. The energy density associated with the curvature of the universe is a significant contribution.
 - b. There are really only two contributions: i) ordinary and nonbaryonic dark matter, and ii) dark energy.
 - c. Neither of the above.
3. **Pauline Destarac summarizes the case for dark energy in the following way:**
 - a. Without dark energy, our universe would end up in a “Big Crunch”.
 - b. We only know about 4% of the composition of the universe.
 - c. Physicists are to blame for a “lack of creativity in the naming department.”
4. **Of the 10 explanations she offers, how many predict new types of particles?**
 - a. One: “Exotic New Particles”
 - b. Two: “Exotic New Particles” and “Virtual Particles”
 - c. Three: “Exotic New Particles”, and “Gravitons”, and “Virtual Particles”
5. **How does she describe the Anthropic Principle?**
 - a. The fundamental constants of physics are “just right” to support life.
 - b. She doesn’t, but rather mixes it up with the Multiverse Theory.
 - c. It arises from the ability of modern physics to predict dark energy.
6. **What is the “Big Rip”, according to Destarac?**
 - a. The universe would start to tear apart, like a piece of fabric.
 - b. Space would expand to the extent that all matter would be pulled apart and “the universe would literally explode”.
 - c. A stupid name given to what is a rather gradual process of infinite expansion.