

QUIZ #7

1. The pattern of orbital speed with location in spiral galaxies gives strong evidence of
 - a) starbursts.
 - b) dominant amounts of invisible mass.**
 - c) grand-design spiral patterns.
 - d) stars in retrograde orbits.

2. The rapid changes in the brightness of quasars show that
 - a) they must be very close to us.
 - b) their energy source must be very small on cosmic scales.**
 - c) their inner regions must be rotating rapidly.
 - d) their redshifts are continually changing.

3. The central energy source in quasars is most likely to be
 - a) a tight cluster of neutron stars.
 - b) explosions of large numbers of supernovae.
 - c) very massive first-generation stars.
 - d) material around supermassive black holes.**

4. The greatest fraction of galaxies contained quasars
 - a) in the first hundred million years of cosmic history.
 - b) when the Universe was about 1/3 of its present age.**
 - c) in the immediate past, seen in our view of Local group galaxies.
 - d) over a wide range as each galaxy's star formation ceased.

5. Mergers between spiral galaxies result in some
 - a) galaxy groups.
 - b) cosmic filaments.
 - c) barred galaxies.
 - d) elliptical galaxies.**

6. The resolution of Olbers' paradox is that the dark night sky tells us that
 - a) the Universe cannot be infinite in both space and time.**
 - b) the Universe must contain large amounts of absorbing material.
 - c) the Universe has always been here.
 - d) we are located near one edge of the Universe.

7. The "Big Bang" happened
 - a) centered near the Milky Way's present location.
 - b) centered on the Virgo Supercluster.
 - c) in the middle of today's Bootes galaxy void.
 - d) everywhere.**

(OVER)

8. The cosmic microwave background radiation originated when
- a) the first stars formed.
 - b) atomic nuclei were first stable.
 - c) the Universe first became transparent.**
 - d) Matter and antimatter were last in balance.
9. Some properties of the Universe are explained if the early Universe underwent
- a) a brief period of exponentially accelerated expansion.**
 - b) a series of cycles of expansion and contraction
 - c) a long period of static form followed by rapid expansion,
 - d) the massive production of black holes.
10. Recent observations of supernovae show that the expansion of the Universe is
- a) going on at a constant rate.
 - b) slowing down as a result of the gravity of everything in it.
 - c) accelerating for some unknown reason.**
 - d) cycling over time between positive and negative rates.