

Closed book, closed notes. Clearly circle ("O") the one choice that you think is most definitely correct. Cross out ("X") only one choice that you think is definitely incorrect.

1. [4.0 points.] Most of the stars in the Milky Way cannot be seen from Earth because of:
 - (A) expanding space.
 - (B) dark matter.
 - (C) interstellar gas and dust.
 - (D) the finite speed of light.

2. [4.0 points.] Dark matter in the Milky Way is located:
 - (A) in supergiant cores.
 - (B) between the spiral arms.
 - (C) above and below the disk, in the halo.
 - (D) inside the central supermassive black hole.

3. [4.0 points.] Evidence that the Milky Way is shaped like a flat disk is:
 - (A) Earth's precession.
 - (B) other disk-shaped galaxies.
 - (C) distant stars dimmer than nearby stars.
 - (D) observations from dark sky locations.

4. [4.0 points.] Gravitational interactions within the disk, or with passing galaxies may explain how _____ in the Milky Way.
 - (A) density waves start.
 - (B) dark matter formed.
 - (C) branches and spurs form.
 - (D) metal-poor stars become metal-rich.

5. [4.0 points.] Evidence that the Milky Way became thinner and flatter as it evolved is that halo stars _____ than disk stars.
 - (A) are cooler.
 - (B) have less metals.
 - (C) are less luminous.
 - (D) have more dark matter.

6. [4.0 points.] The iron in your blood was produced by:
 - (A) the sun.
 - (B) the very early universe.
 - (C) another star, in the past.
 - (D) heat inside Earth's core.
 - (E) (More than one of the above choices.)
 - (F) (None of the above choices.)

7. [4.0 points.] Observing the very early universe, just after the start of the big bang, is possible because of:
 - (A) space-time curvature.
 - (B) the finite speed of light.
 - (C) dark matter.
 - (D) the Doppler effect.

Name (last, first):

4-digit PIN:

Quiz 7

Questions (8)-(10) are continued on the back of this page.

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This quiz continues from questions (1)-(7) on the other side of this page.

8. [4.0 points.] Distant galaxies seem to recede in every direction from the Milky Way because of:
- (A) look-back time.
 - (B) gravitational forces.
 - (C) the finite speed of light.
 - (D) expanding space.
9. [4.0 points.] Evidence that the universe has no center of expansion is that:
- (A) the speed of light is finite.
 - (B) the night sky is dark, and not blindingly bright.
 - (C) matter and antimatter can annihilate into energy.
 - (D) galaxy redshifts are proportional to galaxy distances.
10. [4.0 points.] Tracing the present-day recession of galaxies backwards in time is evidence for:
- (A) a high-density, high-temperature early universe.
 - (B) a closed universe that will expand and collapse again.
 - (C) the origin of dark matter.
 - (D) the location of the center of the universe.

