2021 Ph H1 Q12

Section: Our Dynamic Universe
Topic: The Expanding Universe

A student makes the following statements about the Universe:

I. Velocities and distances of galaxies support the theory of the expanding Universe.
II. A galaxy's mass can be estimated from the orbital speeds of its stars.
III. Dark matter is inferred from the accelerating expansion of the Universe.

Which statements are correct?

Evaluation:

- ✅ **I:** True — Hubble's Law is based on galaxy velocities and distances
- ✅ **II:** True — orbital motion is used to estimate galaxy mass
- ❌ **III:** False — accelerating expansion is evidence for **dark energy**, not dark matter

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Final Answer:

B

Revision Tips:

- Galaxy velocities and redshifts → support expansion (Hubble's Law)
- Galaxy mass is estimated from star orbits using Newtonian physics
- **Dark matter** explains missing mass in galaxies
- **Dark energy** explains the accelerated expansion of space

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