2019 Ph H1 Q10

Section: Our Dynamic Universe
Topic: The Expanding Universe

A student makes the following statements about the Universe:

I. Gravity acts against the expansion of the Universe
II. The rate of expansion is increasing
III. Galaxy mass can be estimated from orbital speeds of stars

Which statements are correct?

Evaluation:

- ✅ **I** – True: gravity slows expansion
- ✅ **II** – True: observations show accelerating expansion (due to dark energy)
- ✅ **III** – True: rotational speeds reveal galactic mass (esp. dark matter)

Final Answer:

E

Revision Tips:

- Gravity opposes expansion, but dark energy overcomes it
- Evidence from distant supernovae → expansion accelerating
- Orbital motion → mass estimation (e.g. via Newton's laws or Kepler's Third Law)
- All three statements are true in modern cosmology
