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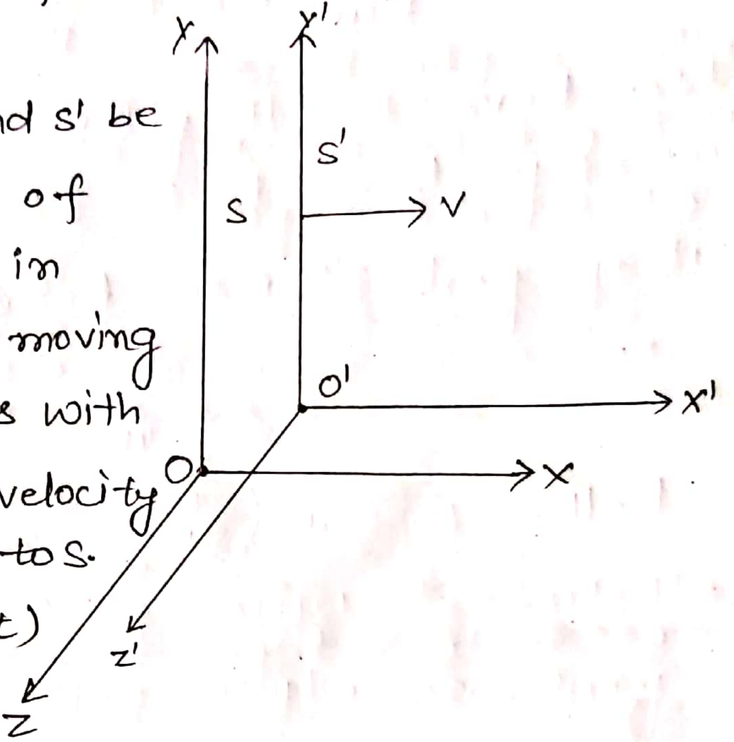
B.Sc (Part-I) Hons

Galilean Transformation Equation:-



Let s and s' be two frames of references, in which s' is moving along x-axis with a constant velocity v relative to s. Let (x, y, z, t) be the space and time co-ordinates of an event for an observer on the frame s, and (x', y', z', t') be the co-ordinates of the same event for an observer on the frame s'. Let the time be counted frame the instant when the origin o and o' momentarily coincide. we have to see how are the measurements x, y, z, t related to x', y', z', t'.

According to the classical mechanics the measurement in the x-direction made in s will be smaller than that made in s' by the amount vt, which is the distance moved by s' in the x-direction.

$$\therefore x' = x - vt \quad \text{——— (1)}$$

There is no relative motion in y and z-directions, hence

$$y' = y \quad \text{——— (2)}$$

and $z' = z$ ——— (3)

In the classical ~~mechani~~ mechanics, the time intervals measured in diffrent frames of refrence in relative motion are the same, and So

$$t' = t \quad \text{——— (4)}$$

The set of equations (1) to (4) are the Galilean transformation equation. However, they violate both the postulates. ~~The~~