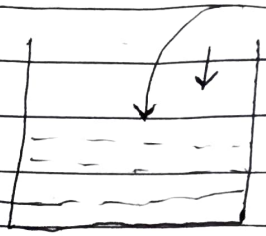
B.Sc Part – I

3/7/21

BROWNIAN MOTION

A very small particle immersed in a liquid exhibits random type of motion known as Brownian motion



* Let a particle be suspended in a liquid

$$F = F_{in} + F_{ex}$$

1) Viscous drag $= 6\pi\eta r V$

on the particle moving with velocity V

2) Force due to all external influence of the surrounding

$$F_{vis} = -\alpha V$$

$$-\alpha \dot{x} \qquad V = \frac{dx}{} = \dot{x}$$

$$F_{net} = F_{vis} + F'$$

$$-\alpha \dot{x} + F'$$

According to Newton IInd law

$$F = ma \qquad a = \frac{d^2x}{dt^2}$$

$$F = m\frac{d^2x}{dt^2} \quad \text{——} (2)$$

$$m\frac{d^2x}{dt^2} = \alpha\dot{x} + F' \quad \text{——} (3)$$

Multiple both side (x)

$$m\frac{d^2x}{dt^2} = -\alpha\dot{x}x + F'x \quad \text{——} (4)$$