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B Sc - I

CONSTRAINTS →

The limitation on the motion of the system are called constraints. A constrained motion is a motion which can not proceed arbitrarily in any manner.

Type of constraints

(1) Holonomic constraints →

constraints can be expressed in the form of equations connecting the co-ordinates of the particles at time 't' then the constraints are called holonomic constraints.

i.e $F(r_1, r_2 \text{ --- } r_N, t) = 0$

Ex → The motion of the bob of a simple pendulum.

(2) Non-holonomic constraints →

constraints can not be expressed in the form of equation (dependent of velocity)

$f(a_1, r_1, \text{ --- } t) \geq 0$

May involve in equalities

May involve non integrable differential equations

Ex- $\frac{d\theta}{dt} = \text{constant}$

(not can expressed in equation form)

(i). Motion of a particle on the surface of sphere which radius (a)

then $|r| \geq a$

$\boxed{r - a \geq 0}$

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