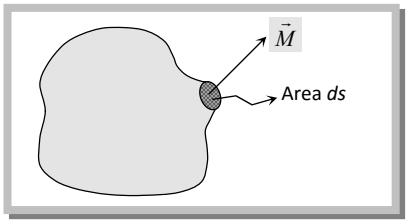
Electric Flux.

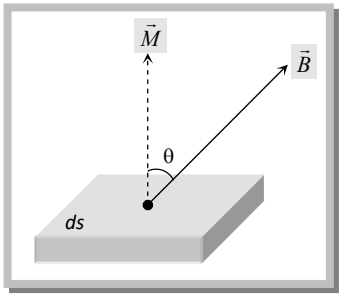
(1) **Area vector:** In many cases, it is convenient to treat area of a surface as a vector. The length of the vector represents the magnitude of the area and its direction is along the outward drawn normal to the area.



(2) **Electric flux:** The electric flux linked with any surface in an electric field is basically a measure of total number of lines of forces passing normally through the surface. **or**

Electric flux through an elementary area $\vec{ds}$ is defined as the scalar product of area of field i.e. $d\phi = \vec{E} \cdot \vec{ds} = E\,ds\,\cos\theta$

Hence flux from complete area (S) $\phi = \int E\,ds\cos\theta$ = ES cosθ



If θ = 0°, i.e. surface area is perpendicular to the electric field, so flux linked with it will be max.

i.e. ϕ_{max} = E ds and ifθ = 90°, ϕ_{min} = 0

(3) **Unit and Dimensional Formula**

S.I. unit – (volt × m) or $\frac{N-C}{m^2}$

It's Dimensional formula – ($ML^3T^{-3}A^{-1}$)

(4) **Types:**For a closed body outward flux is taken to be positive, while inward flux is to be negative