is invariably very high in the entire frequency range.

6·2. THE MAXWELL'S EQUATIONS (Differential Form) ;

We shall now state in differential form, the four equations of Maxwell :

(i) $\nabla \cdot \mathbf{D} = \rho$ → results by the application of Gauss theorem to electrostatics. **D** is the electric displacement in coulombs/meter^2 and ρ is the free charge density in coulombs/meter^3.

(ii) $\nabla \cdot \mathbf{B} = 0$ → results by the application of Gauss theorem to magnetic field. **B** is the magnetic induction in weber/meter^2.

(iii) $\nabla \times \mathbf{E} = -\dfrac{\partial \mathbf{B}}{\partial t}$ → results by Faraday's and Lenz's law of electromagnetic induction. **E** is the electric intensity in volts/meter.

(iv) $\nabla \times \mathbf{H} = \mathbf{J} + \dfrac{\partial \mathbf{D}}{\partial t}$ → results by Maxwell's modification of Ampere's law in a circuital form for

Maxwells Equations (Differential form)

Based on

① $\vec{\nabla}.\vec{D} = \rho$ [Gauss's law for electrostatics

(ii) $\vec{\nabla}.\vec{B} = 0$ [Gauss's law for Magnetosatic

(iii) $\vec{\nabla}\times\vec{E} = -\frac{\partial\vec{B}}{\partial t}$ [Faraday's law (EMMI)

(iv) $\vec{\nabla}\times\vec{H} = \vec{J} + \frac{\partial\vec{D}}{\partial t}$ [Modified Amperi's. Circuital law]

Maxwells Equations (Integral form

① $\oint_S \vec{D}.\vec{ds} = \int_v \rho\, dv$

(ii) $\oint_S \vec{B}.\vec{ds} = 0$

(iii) $\oint_l \vec{E}.\vec{ds} = -\frac{d}{dt}\oint_S \vec{B}.\vec{ds}$

(iv) $\int_l \vec{H}.\vec{dl} = \oint_S \left(\vec{J} + \frac{\partial\vec{D}}{\partial t}\right).\vec{ds}$