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Overview - Electromagnetic Waves

1. What are electromagnetic waves, em spectrum
2. What is Del operator
3. What is field, scalar field, vector field
4. Define gradient of a scalar field and its significance
5. Define divergence of a vector field n its significance
6. Define curl of a vector field n its significance
7. Relationship of electric field and electric potential ($\vec{E} = -\vec{\nabla} V$, ie gradient of scalar potential)
8. Gauss Divergence theorem and Stoke's Theorem (proof not required)
9. Equation of continuity (proof not required, only statement)
10. Maxwell Equations in integral form
11. Differential form of (i) Gauss law of electrostatics (ii) Gauss Law of magnetostatics (iii) Faraday's laws of electromagnetic induction (iv) Ampere Circuital law (steady currents and time varying currents)
12. Write Maxwell equations in differential form and give their significance
13. What is $\vec{D}$, its significance
14. What is displacement current density and cause of its origin
15. Maxwell's electromagnetic wave equation - non conducting medium and for vacuum
16. Energy stored in capacitor, energy stored in inductor, energy density, intensity of em waves (formulas only, no derivation or detail)
17. Poynting vector - definition, units, significance, mathematical expression
18. Transverse nature of em waves
19. Polarization of em waves (in brief and applications only)

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