3. The equation of continuity is

(a) $\nabla \cdot \vec{J} = -\frac{\partial \vec{E}}{\partial t}$ (b) $\nabla \times \vec{J} = -\frac{\partial \mu}{\partial t}$

(c) $\nabla \times \vec{J} = \frac{\partial \vec{E}}{\partial t}$ (d) $\nabla \cdot \vec{J} = -\frac{d\rho}{\partial t}$.

4. The relation connecting $\vec{E}, V$ and $\vec{A}$ is

(a) $\vec{E} = \nabla V - \frac{\partial \vec{A}}{\partial t}$ (b) $\vec{E} = -\nabla V + \frac{\partial \vec{A}}{\partial t}$

(c) $\vec{E} = -\nabla V - \frac{\partial \vec{A}}{\partial t}$ (d) $\vec{E} = \nabla V + \frac{\partial \vec{A}}{\partial t}$.

5. Maxwell's equations are valid under all conditions except one and that is that they do not

(a) Apply to non-linear media

(b) Apply to non-isotropic media

(c) Apply to non-homogeneous media

(d) Apply to media which move with respect to system of coordinates.

6. $\sqrt{\mu/\varepsilon}$ has the dimensions of

(a) An inductance (b) A capacitance

(c) An impedance (d) An electric field.

7. An array in which the maximum field direction is along the array is

(a) Broadside array (b) End fire array

(c) Yagi antennas (d) Loop antennas.

8. The region of anomalous dispersion coincides with the region of

(a) Minimum absorption

(b) Minimum amplitude

(c) Maximum absorption

(d) Maximum reflection.

9. The Lorentz force law in relativistic notation is given by

(a) $K^{\mu} = q F^{\mu\nu}$ (b) $K^{\mu} = \eta_{\nu} F^{\mu\nu}$

(c) $F^{\mu} = q \eta_{\nu} K^{\mu\nu}$ (d) $K^{\mu} = q \eta_{\nu} F^{\mu\nu}$.

10. The Lorentz gauge condition is

(a) $\nabla \times \vec{A} = -\varepsilon \mu \frac{\partial r}{\partial t}$ (b) $\nabla \times \vec{A} = -\frac{1}{\varepsilon\mu} \frac{\partial r}{\partial t}$

(c) $\nabla \cdot \vec{A} = -\varepsilon \mu \frac{\partial r}{\partial t}$ (d) $\nabla \cdot \vec{A} = \frac{1}{\varepsilon \mu} \frac{\partial r}{\partial t}$.