AS-201: ENGINEERING PHYSICS - II Assignment – 03

1. Write differential and integral form of Maxwell's equations and explain physical significance of each equation.

2. Derive Maxwell's equations. Explain the physical significance of each equation.

3. Explain the concept of displacement current and show how it led to the modification of Ampere's law.

4. Show that EM waves in free space travel with speed of light.

5. Write down Maxwell's equations in free space and using these equations derive wave equations for both electric and magnetic fields.

6. Write down Maxwell's equations in non-conducting medium and using these equations, derive wave equations for both electric and magnetic fields.

7. Write down Maxwell's equations in conducting medium and using these equations derive wave equations for both electric and magnetic fields.

8. Deduce wave equation for EM waves in conducting medium.

9. What is skin depth? Show that for poor conductors, skin depth is independent of frequency of the wave.

10. Derive Poynting theorem and explain its physical significance.