P3637

APR-15/ENGG.-122
T.E. (Electronics & Telecommunication) (In Sem - Semester - II)
ANTENNA AND WAVE PROPAGATION
(2012 Pattern)

Time : 1 Hour]   *[Max. Marks : 30*

Instructions to the candidates:
1)   *Solve any three questions (Q1 OR Q2, Q3 OR Q4 and Q5 OR Q6).*
2)   *Figures to the right indicate full marks.*
3)   *Assume suitable data wherever necessary.*

Q1) a)   What is polarization & Explain polarized wave and unpolarized wave.**[4]**

   b)   A uniform plane wave with 25v/m electric field is normally incident on an infinitely thick slab of material of dielectric constant 5. Find electric and magnetic fields inside the slab surface. How much power penetrates the material slab?   **[6]**

OR

Q2) a)   State poynting theorem for time varying Electromagnetic wave.   **[5]**

   b)   Write Maxwell's Equation in phasor form of time varying Electromagnetic wave.   **[5]**

Q3) a)   Explain in detail factors affecting the performance of Wireless Channel.**[6]**

   b)   Two planes 15 km apart are in radio communication. The transmitting plane delivers 500 watt. Its antenna gain being 10 in the direction of other plane, Power observed is 2 microwatts by the receiving antenna of the second plane. Find the effective area.   **[4]**

OR

Q4) a)   With reference of sky wave define,   **[6]**

   i)   Virtual height

   ii)   Critical frequency

   iii) MUF

   b)   Derive the friss transmission equation for free space propagation.   **[4]**

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Q5) a) Explain radiation mechanism of antenna. **[4]**

   b) A lossless antenna has input impedance of 75Ω, maximum effective aperture of 2.147 (m^2) at a operating frequency of 100 MHz. Antenna is connected to 50Ω transmission line. Find directivity of the antenna assuming no polarization loss. **[6]**

OR

Q6) a) Explain the following term with respect to antenna. **[5]**

   i) Gain

   ii) Radiation intensity

   iii) Radiation power density

   b) Derive vector potential 'F' for an magnetic current source 'M'. **[5]**

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