Total No. of Questions :6]

SEAT No. :

P55

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T.E/Insem./APR-60
T.E. (E&TC)
304190 : ANTENNA & WAVE PROPAGATION
(2012 Pattern) (Semester - II)

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

Instructions to the candidates:

1) ***Answer any one Question out of Q1 or Q2, Q3 or Q4, Q5 or Q6.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume Suitable data, if necessary.***

Q1) a) State the Maxwell's equation for static & time varying EM fields satisfying different laws of Electromagnetics **[4]**

b) Derive the expression for attenuation constant, phase constant, propagation constant for a good conductor. **[6]**

OR

Q2) a) Explain linear, circular and elliptical polarization. **[6]**

b) In a non-magnetic medium with intrinsic impedance 99 ohms and E=4 sin $\left(2\pi^{*}\ 10^{7}t-0.8x\right)a_{z}$ v/m. Find; **[4]**

i) Time average power carried by wave

ii) The total power crossing 100 cm^2 of plane $3x+y=10$.

Q3) a) Explain in detail with neat sketches, **[6]**

i) Ground wave propagation.

ii) Sky wave propagation

P.T.O.

b) Calculate the skip distance for flat earth with MUF of 10mhz. If a wave is reflected from a height of 300km where maximum value of refractive index is 0.8 Calculate the skip distance for flat earth with MUF of 10MHz.if a wave is reflected from a height of 300km where maximum value of refractive index is 0.8. **[4]**

OR

Q4) a) Explain in detail the characteristics of the different ionized regions of ionosphere. **[5]**

b) Explain the effect of earth's magnetic field on Ionospheric propagation. **[5]**

Q5) a) Define & explain following Antenna parameters **[6]**

i) Antenna Aperture

ii) Effective Length

iii) Efficiency of antenna

b) An antenna has loss resistance 10 ohms, power gain of 20 and directivity 22. Calculate its radiation resistance. **[4]**

OR

Q6) a) Define & explain following Antenna parameters **[6]**

i) Directivity

ii) Radiation Resistance

iii) Directive Gain

b) The radiation intensity of an antenna is given by

$$U(\theta,\Phi)=(\cos\theta)^4(Sin2\Phi)^2 \; for 0\le\theta\le\frac{\pi}{2} and 0\le\Phi\le 2\pi$$

(i.e. upper half space only). Find power radiated and directivity. **[4]**