Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech**
PET6J012

6th Semester Regular / Back Examination 2018-19
ANTENNAS AND WAVE PROPAGATION
BRANCH : ECE, ETC
Max Marks : 100
Time : 3 Hours
Q.CODE : F742

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right hand margin indicate marks.

Part- I

Q1 **Only Short Answer Type Questions (Answer All-10)** **(2 x 10)**

a) Compare electric scalar potential and magnetic vector potential.
b) What is Pattern Multiplication?
c) Give the value for radiation resistance of a center-fed half wave dipole.
d) What are the drawbacks of lens antenna?
e) What are the effects of earth curvature on tropospheric propagation?
f) Why log periodic antenna is named so far?
g) What is meant by faraday rotation?
h) What are the features of micro strip antenna?
i) Draw E and H plane radiation pattern of a dipole.
j) Differentiate virtual height from actual height.

Part- II

Q2 **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(6 x 8)**

a) Define the following parameters and their dependence on antenna performance.
a. Radiation pattern
b. Input impedance
c. Polarization
b) With necessary illustrations explain the radiation characteristics of Yagi Uda antenna.
c) a. Explain the ground wave propagation of radio waves.
b. Write notes on faraday rotation.
d) Derive the total power radiated by half wave dipole.
e) How does a log periodic antenna provide a large bandwidth of operation?
f) Explain the principle of operation and applications of loop antenna.
g) Write short notes on
a. Binomial arrays
b. Phased arrays
h) Explain the retarded vector potential in detail.
i) Explain in detail the design aspects of Rectangular Microstip Patch Antenna.
j) Describe how the radiation pattern and Radiation resistance of a given antenna can be measured experimentally.
k) Explain the following terms with diagram
a. Duct propagation
b. Critical frequency
c. Skip Zone
l) Explain the effect of Earth's Magnetic Field on Radio wave Propagation

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Derive the expression for array factor of a linear array of four isotropic element spaced $\lambda/_2$ apart fed with signals of equal amplitude and phase. Obtain the direction of maxima and minima. **(16)**

Q4 Derive the expression for the far field pattern of an array of 2 – isotropic point sources **(16)**
a) Equal amplitude and phase
b) Equal amplitude and opposite phase

Q5 Discuss the geometry of parabolic reflector and the significance of $f/_D$ ratio, Explain its feed configuration. **(16)**

Q6 Draw and explain the function of Helical antenna and various modes of radiation. Highlight some of its applications. **(16)**