Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019
Course Code: EC306
Course Name: Antenna & Wave Propagation

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any two full questions, each carries 15 marks

Marks

1 a) Define Radiation resistance, HPBW, and effective length of an antenna   (7)

   b) Derive the expressions for far field pattern Electric and Magnetic fields of a short dipole excited with constant current. Derive expression for directivity of the short dipole antenna.   (8)

2 a) Explain antenna temperature.   (8)

   b) Derive reciprocity theorem for antennas.   (7)

3 a) Explain the procedure involved in the radiation gain measurement of antenna   (8)

   b) Explain how the input impedance of an antenna is measured.   (7)

PART B
Answer any two full questions, each carries 15 marks

4   Derive expression for array factor of N isotropic sources for end-fire array. Derive expression for major lobe, minor lobes and Nulls of the array.   15

5   a)Design a 5 element Dolph-Chebyshev array with peak side lobe level 19.5dB   (10)

   b) Explain the working of V antenna   (5)

6 a) Explain the working of a parabolic dish antenna. Write down the expression for gain, HPBW and BWFN   (7)

   b) Explain the working of a rhombic antenna and it uses.   (8)

PART C
Answer any two full questions, each carries 20 marks

7 (a) Explain the working of a log periodic dipole array and explain it's design steps.   (15)

   b) Explain ground wave propagation   (5)

8 a) Explain axial mode helical antenna. Write down the expression for gain ,HPBW,BWFN and radiation resistance of axial mode helical antenna.   (12)

   b) Neglecting the effect of earth's magnetic field derive expression for refractive index of ionosphere.   (8)

9   Derive expression for line of sight distance and received field strength for space wave propagation   (20)