

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 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 beam solid angle and directivity of an antenna	9
	b) Draw the equivalent circuit of a receiver antenna	6
2	a) Derive expression for far field pattern of a half wave dipole antenna and find position of Nulls and BWFN.	10
	b) Explain any one method of gain measurement of an antenna	5
3	a) A transmitter antenna transmits 10watt power at 100Mhz with efficiency 80%. The gain of the transmitter antenna is 3. The receiver antenna is at a distance 5km from transmitter which is identical to transmitter. The effective length of receiver antenna is 0.3λ . Calculate	8
	a) The power density at the receiver antenna	
	b) Electric field intensity at the receiver antenna.	
	c) The power received by the receiver antenna.	
	d) The voltage induced at the input terminal of the antenna	
	b) Explain the concept of retarded potential	7
4	Plot the radiation pattern of a 4 element linear broadside array with isotropic point sources with spacing $d = \frac{\lambda}{4}$. Find BWFN of the array,	15
5	a) With necessary equations explain the principle of beam steering	10
	b) Explain binomial array	5
6	a) Explain the working of a rhombic antenna	10
	b) Explain the principle of pattern multiplication	5

- 7 Explain rectangular micro strip patch antenna and explain its design steps. 20
- 8 Derive expression for effective refractive index, critical frequency, maximum usable frequency and skip distance (assuming flat earth's surface) for sky wave propagation 20
- 9 a) Explain normal mode and axial mode helical antenna (10)
- b) Derive expression for line of sight distance for space wave propagation (10) assuming effective radius of earth,
