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Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Sixth semester B.Tech degree examinations (S), September 2020

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)	With a neat diagram of the experimental setup, explain how radiation pattern measurement of anantenna is carried out.	(10)
	b)	Explain antenna field zones	(5)
2	a)	Derive expressions for the Far Field components and Radiation Resistance of a short dipole antenna.	(12)
	b)	Calculate the effective aperture of a short dipole antenna operating at 100 MHz.	(3)
3	a)	State and Prove Reciprocity Theorem.	(7)
	b)	The radiation intensity of the major lobe of an antenna is represented by	(8)

$$U = A_0 Cos\theta, \quad 0 < \theta < \frac{\pi}{2}, \quad 0 < \Phi < 2\pi$$

Find the maximum directivity?

PART B

Answer any two full questions, each carries 15 marks

4	a)	Explain the working of a rhombic antenna and its applications.	(8)
	b)	Explain the working of V antenna.	(7)
5	a)	Design a Dolph –Tschebyscheff array of 10 elements with spacing of d = λ/2 between the elements and major to minor lobe ratio is 26 dB.	(15)
6	a)	Derive expression for directions of pattern maxima, pattern minima and HPBW for a endfire array of 'n' elements.	(10)
	b)	With neat diagrams explain the principle of operation of a Horn antenna.	(5)

PART C

Answer any two full questions, each carries 20 marks

7	a)	With detailed diagrams explain the structure and modes of operation of helical antenna.	(12)
	b)	Explain duct propagation.	(8)
8	a)	Define Critical frequency and Maximum usable frequency.	(5)

    b)   With the help of neat diagrams explain the principle of operation of Log   (10) PeriodicAntenna.

    c)   Explain Tropospheric scatter propagation.   (5)

9 a)   Design a rectangular microstrip antenna using a dielectric substrate with   (15) dielectric constant of 2.2, h = 0.1588 cm so as to resonate at 10 GHz.

    b)   What is fading. Explain the diversity techniques adopted in wave propagation.   (5)

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