Code No: RT31045 **R13** SET - 1

III B. Tech I Semester Supplementary Examinations, October/November - 2018

ANTENNA AND WAVE PROPAGATION

(Electronics and Communication Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **Three** Questions from **Part-B**

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PART –A

1.	a)	Estimate radiation intensity if power density is $A_o \sin\theta$?	[3M]
	b)	Estimate the retarded time in antenna field propagation at a radial distance 6λ?	[3M]
	c)	Draw the configuration of 16 elements in linear, planar and circular Array structure?	[4M]
	d)	Define resonant and non-resonant radiators?	[4M]
	e)	Discuss about importance of F/D ratio in parabolic antenna?	[4M]
	f)	Define path loss in FRIIS Transmission formula?	[4M]

PART -B

2.	a)	Explain the working principle of a single wire antenna?	[8M]
	b)	Define effective height (h_{eff}) of an antenna? Discuss h_{eff} for half wave Dipole and short dipole antenna?	[8M]
3.	a)	Using basic equations, prove that R_{rad} of a half wave dipole is 73Ω?	[8M]
	b)	Find the radiation resistance of a loop antenna(i) single turn (ii) Number of turns =10 of diameter 0.5 m and operating at 1 MHz .	[8M]
4.	a)	Derive the array factor of N-element isotropic linear uniform distributed Antenna?	[8M]
	b)	An array contains 10 isotropic radiators with an inter element spacing of 0.5λ. It is required to produce broadside and end-fire beams i) Find Null-to-Null beam width and half-power beam width in degrees. ii) Find the directivity of both forms of arrays.	[8M]
5.	a)	Design and explain the working principle of a microstrip antenna?	[8M]
	b)	Explain the working principle of a helical antenna in normal mode?	[8M]
6.	a)	List out different types of Familiar reflector antennas? Explain any one of the antenna?	[8M]
	b)	Explain the Gain Measurement 3-antenna method?	[8M]
7.	a)	A transmitter operating at a frequency of 2 MHz is required to provide a ground wave field strength of 0.5 mV/m at a distance 10 km. A short Vertical transmitting antenna has an efficiency of 50% .The conductivity of the ground is 5×10^{-5} (mho) / cm and its relative permittivity is 10. Find the transmitter power required.	[8M]
	b)	Derive the LOS distance in space wave propagation?	[8M]

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