Code No.: 6338

## FACULTY OF ENGINEERING

## B.E (III/IV Year) (ECE) II Semester (Main) Examination, June 2010

## ANTENNAS AND PROPOGATION

Time : 3 Hours]

[Max. Marks: 75

Answer all questions of Part A. Answer five questions from Part B. Part A – (Marks 4 25)

- State the relationship between antenna gain and directivity. Antenna gain of 2.14 dB with 96% efficiency has \_\_\_\_\_\_ directivity. (3)
- 2. A thin antenna is  $\lambda/10$  long. Its loss resistance is 1.5 ohms. Find the radiation resistance. (2)
- 3. A lossless Half wave dipole with input impedance of  $73\Omega$  is to be connected to a transmission line having 50 characteristic impedance. Calculate the efficiency. (3)

4.	List the important application of Helical antenna. $\Omega$	(2)
5.	Write the excitation coefficients for 5 element linear binomial array.	(2)
6.	Explain pattern multiplication.	(3)

- 7. An antenna of 30 cm diameter is operating at 9 GHz. How nearest is the farfield of antenna is measured? (2)
- 8. Write all the precautions to be taken while conducting antenna measurements. (3)
- 9. Calculate the radio horizon distance for an antenna of height 10 meters. (2)

10. What are the conditions for Duct propagation.

## **Part B –** (Marks : 50)

11. (a)	Explain Hertzian dipole. Calculate the directivity of a Hertzian dipole.			(7)
(b)	Define	(i) effective length	(ii) effective aperture area of an antenna.	(3)

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(3)

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12. Dei	rive the equation for the magnetic vector potential for a half-wave dipole antenna.
(10	)
13. (a)	Show that the first secondary maximum is about 13.5 dB below the principal maximum in the case of an 'n' element uniform linear array. (7)
(b)	Differentiate between broadside and End fire arrays. (3)
14. (a)	With a neat sketch explain about Yagi-Uda antenna. (7)
(b)	Explain about Lens antenna. (3)
15. (a)	Derive Secant law in skywave propagation. (5)
(b)	Discuss the factors to be considered, which may effect the signal strength in space wave propagation. (5)
16. (a)	List all the precuations to be taken while conducting antenna measurements. (4)
(b)	Derive friis transmission formula. (6)
17. Wr	ite short notes on : (10)

- (i) Horn antenna
- (ii) Parabolic reflector antenna.