Reg. No. : ....

Name : ....

Sixth Semester B.Tech. Degree Examination, May 2013
(2008 Scheme)
Branch : Electronics & Communication
08.605 : ANTENNA AND WAVE PROPAGATION (T)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **4** marks.

1. Define the terms :

   a) antenna efficiency

   b) effective area

2. What is retarded potential ?

3. Derive an expression for effective height of an antenna.

4. What is pattern multiplication ?

5. Differentiate between uniform linear array and bilinear array.

6. Why log periodic antenna is called frequency independent antenna ?

7. What is Secant law ?

8. What is the significance of virtual height ?

9. What is duct propagation ?

10. Derive the expression for LOS distance.

PART – B

Answer **2** questions from **each** Module. **Each** question carries **10** marks.

Module – I

11. Derive expression for radiation resistance of halfwave dipole.

12. a) State and prove reciprocity theorem.

    b) Calculate the effective length of a $\lambda/2$ antenna given $A_{em} = 0.13\lambda^2$.

13. Describe the method for the measurement of radiation pattern and gain of an antenna.

Module – II

14. Derive expressions for radiation pattern of endfire array with n vertical dipoles and sketch the radiation pattern for $n = 4$, $d = \lambda/2$.

15. Draw the diagram of helical antenna and explain the different modes of radiation.

16. Sketch the radiation pattern of 8 antenna elements with $d = \lambda/2$ and fed in phase.

Module – III

17. Explain the different modes of propagation.

18. Derive the expression for refractive index of ionosphere.

19. a) Explain on VHF and UHF mobile radio propagation.

    b) A radiowave is incident on a layer of ionosphere at an angle of 30 degrees with the vertical. If the critical frequency is 1.2 MHz, what is MUF ?