Exam.Code:0929
Sub. Code: 33666

2076

B.E. (Electronics and Communication Engineering)

Fifth Semester

EC-503: Antennas and Wave Propagation

Time allowed: 3 Hours Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

Q.1a) Define directivity. How is it different from gain?

b) What is a **BALUN**? Enlist its types.

c) What is top loading in antennas? Why is it used?

d) What is surface wave propagation?

e) What is fading? How is it caused? (5×2)

UNIT - I

Q.2a) Explain the concept of antenna arrays. How does spacing affect the radiation pattern? What are the advantages and disadvantages of using antenna arrays? (6)

b) What is antenna efficiency? Discuss the factors affecting antenna efficiency. (4)

Q.3a) What are "broadside" and " end fire " arrays? (4)

b) What is the Dolph-Chebyshev distribution for linear broadside arrays. Show that it is the optimum distribution for obtaining beam width for given side lobe level and vice versa. (6)

Q.4 a) Distinguish between antenna bandwidth and antenna beam-width. (4)

b) Derive an expression for radiated power for infinitely small element carrying alternating current. (6)

UNIT - II

Q.5a) Compare surface wave, sky wave, and space wave propagation. (4)

b) How the field pattern of a receiving antenna is experimentally found? Give a block diagram and explain. Is the reciprocity principle used? (6)

Q.6a) Write short note on (6)

(i) Whip Antenna

(ii) Rhombic antenna

b) Discuss tropospheric propagation in detail. (4)

Q.7 State and discuss the conditions of total reflection of radio waves from the ionosphere. Prove that the skip distance D for a given frequency is given by (10)

$$D = 2h \{(f/f_c)^2-1\}^{1/2}$$

x-x-x