P4–Exam.–09–269

Con. 3075–09.

VR–5388

(3 Hours) [Total Marks : 100]

N.B. : (1) Question No. **1** is **compulsory**.

(2) Attempt any **four** of remaining **six** questions.

(3) Assume **suitable data** if **needed**.

(4) Support your answer with **neat sketches**.

1. Write briefly about :—

    (a) Radiation resistance   3

    (b) Directivity   3

    (c) Antenna resolution   4

    (d) Rhombic antenna   4

    (e) Critical frequency   3

    (f) Antenna arrays   3

2. (a) Derive an expression for near field and for field equation of short electric dipole.   10

    (b) An antenna has a field pattern given by $E(\theta) = \cos\theta \, \cos2\theta$ for $0 < \theta < 90°$ 10
Find — 1) Half power beamwidth.
         2) First Null beamwidth.

3. (a) Describe space wave propogation and derive relation for maximum distance   12
between transmitting and recieving antenna. Earth is assumed to be flat.

    (b) Explain ducting effect. Under what conditions this effect takes place.   8

4. (a) What is array factor ?   5

    (b) Explain pattern multiplication. Draw the radiation for an array of two parallel, half   10
wavelength space short dipoles using pattern multiplication.

    (c) Explain briefly about parasitic array.   5

5. (a) Explain working of log periodic antenna. Write down practical application of the   10
antennas.

    (b) What do you mean by fading ? How it can be minimized ?   5

    (c) Discuss behaviours of loop antenna and sketch its field pattern.   5

6. (a) Describe parabolic reflector and its use of microwave frequencies. Discuss   10
Cassegrain method of feeding parabolic reflectors.

    (b) Explain structure of microstip antenna. Discuss its feed mechanisms and   10
application.

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7. Write technical **notes** on :—

    (a) Sleeve dupole

    (b) Biconical antenna

    (c) Friss Transmission formula

    (d) Formation of layer in Ionosphere.

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