Q.P. Code : 588001

(3 Hours) **[Total Marks 80]**

N.B. 1) Question No.1 is Compulsory.
2) Solve any three questions from the remaining.
3) Assume suitable data wherever necessary and justify the assumption.
4) Draw suitable diagrams wherever required.

1. a) Compare Binomal filter and chebyshev filter . **5**
b) What is reactive near field. Explain its importance in communication and its applications. **5**
c) Compare Broadside and Endfire array. **5**
d) Find the gain of an antenna when physical aperture is 5 m^2 at 2 GHz with efficiency 70%. **5**

2. a) Design a composit high pass filter by image parameter method with the following specification. **10**
$R_o = 75\ \Omega$, $f_c = 50$ MHz, $f_\infty = 48$ MHz.
b) Design a LPF whose input and output ports are matched to 50Ω impedance with cut off frequency of 3 GHz, equi ripple of 0.5 dB and rejection of atleast 40 dB at approx twice the cut off frequency. **10**

3. a) Derive friss transmission formula state its significance in wireless communicaiton. What is maximum power received at a distance of 0.75 km over free space for 1GHz frequency. The system consist of transmitting antenna with 3dB gain and receiving antenna with 17dB gain and antenna is fed with 200 W power. **10**
b) Derive radiation resistance of small dipole. Explain its significance. **10**

4. a) Find the radiation pattern for an array of 4 elements fed with same amplitude and opposite phase. Find its HPBW and BWFN. **10**
b) Draw the structure of microstrip antenna. Discuss its characteristics, limitations and applications. **10**

5. a) Describe parabolic reflector antenna and its different feeding methods. **10**
b) Explain important features of loop antenna. Discuss use of loop antenna in radio direction finding. **10**

6. Write short notes on : **20**
a) RF field effect transistor
b) Binomial array
c) RF behavior of resistor and capacitor
d) Helical antenna

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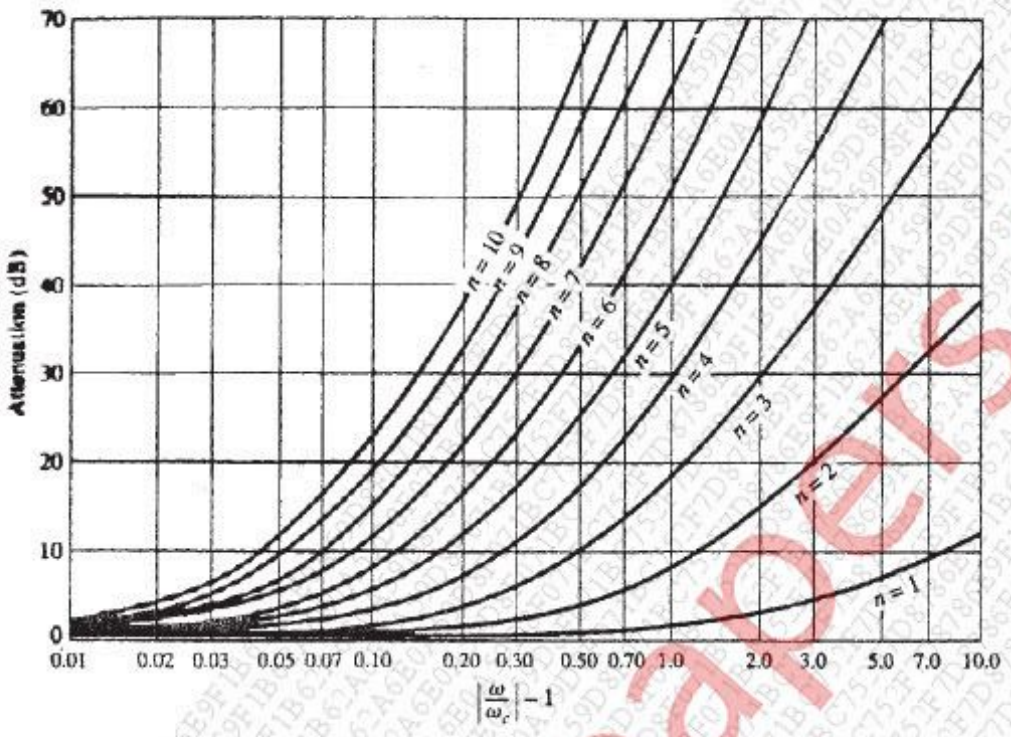

Attenuation versus normalized frequency for equal-ripper filter prototypes.

(a) 0.5 dB ripple level.