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**E Reg. No. :**

**Question Paper Code: 51P22**

M.E. DEGREE EXAMINATION, NOV 2017

First Semester

Communication Systems

15PCM102-ADVANCED RADIATION SYSTEMS

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

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| --- | --- | --- | --- | --- |
| 1. | (a) | Explain current distribution of mobile phone antenna. | CO1- U | (20) |
|  |  | Or |  |  |
|  | (b) | State and derive Lorentz reciprocity theorem for the receiving antennas. | CO1- U | (20) |
|  |  |  |  |  |
| 2. | (a) | Compute the far electric filed component using Fourier transform technique, for an antenna, assuming aperture dimensions and aperture distributions are known. | CO2- U | (20) |
|  |  | Or |  |  |
|  | (b) | Explain the working of a Slot antenna. Derive an expression for input impedance of a slot antenna. | CO2- U | (20) |
|  |  |  |  |  |
| 3. | (a) | Derive an expression for steering vector of phased array antenna. Explain its significance. Give an account of beam forming networks for phased array antenna. | CO3- App | (20) |
|  |  | Or |  |  |
|  | (b) | Derive an expression for the far filed of a continuous array of point sources of uniform amplitude and phase. Describe and prove mathematically for finding directions of pattern nulls of the array. | CO3- App | (20) |
|  |  |  |  |  |
| 4. | (a) | Derive an expression for input impedance of a rectangular & circular patch antenna. | CO4- Ana | (20) |
|  |  | Or |  |  |
|  | (b) | Design a rectangular Microstrip antenna using a substrate with dielectric constant of 2.2, h = 0.1588 cm so as to resonate at 2.45 GHZ | CO4- Ana | (20) |
|  |  |  |  |  |
| 5. | (a) | Is current distribution measurement important in an antenna? Justify. How it is being measured? Explain it through an experiment setup. | CO5- U | (20) |
|  |  | Or |  |  |
|  | (b) | Draw a neat block diagram for antenna radiation pattern & gain measurement. Explain the procedure in detail. | CO5- U | (20) |
|  |  |  |  |  |