

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –III Examination Dec. - 2011

Subject code: 732701

Date: 08/12/2011

Subject Name: Smart Antenna for Wireless Communication

Time: 10.30 am – 01.00 pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q-1 (a)** Explain in brief special types of Antenna. 7
- (b)** The radial component of the radiated power density of an infinitesimal linear dipole of length $l \ll \lambda$ is given by 7
- $$W_{av} = \hat{a}_r A_0 \sin^2 \theta / r^2 \quad (\text{W/m}^2)$$
- Where A_0 is the peak value of the power density, θ is the usual spherical coordinate and $\hat{a}_r$ is radial unit vector. Determine the maximum directivity of the antenna.
- Q-2 (a)** Compare Fixed Beam forming and Switched beam forming networks 7
- (b)** Explain Small Scale fading, and Large Scale Path Loss. 7
- OR**
- Q-2 (a)** Explain : (i) Antenna Efficiency (ii) Beam Efficiency. 7
- (b)** Write short note on Wideband Smart antenna System. 7
- Q-3 (a)** (i) The Vector Channel Impulse Response and the Spatial Signature. 4
- (ii) Key benefits of Smart Antenna 3
- (b)** Draw and Explain Linear Equally Spaced (LES) Antenna Array system. 7
- OR**
- Q-3 (b)** Explain Spatial Diversity Combining and Sectoring for Smart Antennas. 7
- Q-4 (a)** Explain downloading beamforming techniques for CDMA. 7
- (b)** A vector based Approach for Range and Capacity Analysis Using Smart Antennas. 7
- OR**
- Q-4 (a)** Draw architecture of coherent combining array Receiver for CDMA system and Explain it. 7
- (b)** Reverse Channel Performance of Multi-cell Systems with Spatial Filtering at the Base Station. 7
- Q-5 (a)** Explain General Model for TDOA Estimation. 7
- (b)** Explain: (i) True ranging PL Systems, (ii) Elliptical PL Systems, 7
- OR**
- Q-5 (a)** Explain Cross correlation method for TDOA Estimation. 7
- (b)** Explain: (i) Hyperbolic PL Systems, (ii) Direction finding PL System. 7
