

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE – SEMESTER – VI (NEW).EXAMINATION – WINTER 2016**

**Subject Code: 2161003****Date: 24/10/2016****Subject Name: Antenna & Wave Propagation****Time: 10:30 AM to 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) Define and discuss the following parameters / terms with help of necessary formula: **07**  
 i) Radiation patterns  
 ii) Beam Area  
 iii) Directivity
- (b) Explain radio Communication link between transmitting antenna and receiving antenna **07**
- Q.2** (a) An Isotropic antenna is radiating in free space. At a distance of 100 meter from the antenna the total electric field ( $E_{\theta}$ ) is measure to be 5 V/m. Find the power density and the power radiated. **07**
- (b) Derive the expression for the radiation resistance of half-wave dipole. **07**
- OR**
- (b) Explain different method for Antenna feeding. **07**
- Q.3** (a) Explain the experimental setup for the antenna phase measurement. **07**
- (b) Explain long distance communication by tropospheric scattering. **07**
- OR**
- Q.3** (a) Explain the experimental setup for the antenna gain measurement **07**
- (b) Write a short note : Plasma Antenna. **07**
- Q.4** (a) What do you mean by frequency independent antenna? Explain the condition for the frequency independent antenna. **07**
- (b) Write a short note on lens antenna. **07**
- OR**
- Q.4** (a) State and explain babinet's principal with example. **07**
- (b) Explain different types of reflector Antennas. **07**
- Q.5** (a) Which are the various forms of antenna array? Explain their technical feature with ideal radiation pattern. **07**
- (b) Obtain the expression for the far field of circular loop antenna. **07**
- OR**
- Q.5** (a) Explain the principal of pattern multiplication for the antenna array. **07**
- (b) Write a short note on smart antenna. **07**

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