

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (OLD) - EXAMINATION – SUMMER 2018

Subject Code:161003

Date:28/04/2018

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 explain the following terms for an antenna **08**
- (i) Polarization
 - (ii) Directive Gain and Directivity
 - (iii) Effective Aperture and Effective Length
 - (iv) Antenna Impedance
- (b)** Answer the following **06**
- (i) The transmitting and receiving antennas are operating at 6 GHz with gain of 30 and 20 db respectively. The distance between antennas is 100m and input power is 200 W. Find the power delivered to the load. Assume loss is zero.
 - (ii) What is an antenna pattern? Explain its various types in brief.
- Q.2 (a)** Derive the maxima, minima and half power point directions if two point sources are fed with currents equal in magnitude and phase. **07**
- (b)** Define uniform linear array. Compare the end fire and broadside linear array. **07**
- OR**
- (b)** Explain the various types of loop antenna. What are its applications? **07**
- Q.3 (a)** What is parasitic element? Explain the design of Yagi-Uda antenna. **07**
- (b)** What is non resonance antenna? Explain the design of rhombic antenna and enlist advantages and disadvantages of this antenna. **07**
- OR**
- Q.3 (a)** With help of graphical pattern multiplication principal find the radiation pattern of eight isotropic elements spaced by $\lambda/2$ distance with equal amplitude and phase of feeding current. **07**
- (b)** Explain the various feeding mechanism of parabolic dish antenna. What is its application? **07**
- Q.4 (a)** What is rumsey's principle? Explain the design and working of log periodic antenna. **07**
- (b)** Explain the transmission, radiation and propagation of electromagnetic waves. **07**
- OR**
- Q.4 (a)** Explain the structure, radiation mode and application of various types of horn antenna. **07**
- (b)** What is fermat's principle? Explain the E-plane and H-plane metal plate lens antenna. **07**

- Q.5 (a)** Define and explain the following terms for radio wave propagation. **07**
(i) Radio Horizon (ii) Tropospheric Propagation (iii) Virtual Height
- (b)** Explain antenna polarization measurement methods. **07**
- OR**
- Q.5 (a)** Define and explain the following terms for radio wave propagation. **07**
(i) Sky Wave Propagation (ii) MUF and Critical Frequency
- (b)** Write Short note on : **07**
(i) Phase Measurement (ii) Plasma Antenna
