

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(OLD) EXAMINATION – WINTER 2022****Subject Code:161003****Date:13-12-2022****Subject Name:Antenna and Wave Propagation****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1 (a)** Explain following antenna parameters: **07**
 i. Radiation resistance ii. Antenna efficiency iii. Directivity iv. Gain
- (b)** Derive the expression of Friss transmission formula for radio link. **07**
- Q.2 (a)** Derive the formula of radiation resistance for dipole antenna. **07**
(b) Write a short note on Antenna Radiation Pattern with necessary figure. **07**
- OR**
- (b)** What is Hertzian dipole? Write the relation between a current element and an electric dipole writing suitable expressions. **07**
- Q.3 (a)** Explain following with respect to linear arrays: **07**
 i. Schelkunoff theorem ii. Discuss Dolph–Tchebysheff distribution
- (b)** Why smart antenna is called so? Explain in detail the concept of smart antenna with appropriate diagrams. **07**
- OR**
- Q.3 (a)** List out various antennas for special applications. Explain any one in brief. **07**
(b) List out various methods of antenna gain measurement. Describe any one in brief. **07**
- Q.4 (a)** Explain different types of Reflector antennas. **07**
(b) Explain Yagi Uda antenna in detail. **07**
- OR**
- Q.4 (a)** Discuss two Modes of Helical antenna. Enlist the design step for any one mode with the help of necessary formula. **07**
(b) Explain Babibet's principal for slot antenna. **07**
- Q.5 (a)** Explain Ground Wave Propagation in Detail. **07**
(b) Explain (i) Skip Distance (ii) Critical Frequency (iii) MUF **07**
- OR**
- Q.5 (a)** Discuss feed Methods of Microstrip Patch antenna. **07**
(b) Write a detailed note on role of ionosphere in sky wave propagation. **07**
