

PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Winter 2022 - 23 Examination

Semester: 7**Subject Code: 203107427****Subject Name: Antennas and Propagation****Date: 06/10/2022****Time: 10:30am to 1:00pm****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (All are compulsory) (Each of one mark)**(15)**

1. Which of the following statements is false regarding smart antenna for 802.11 applications?
 - a) Coverage area is increased
 - b) Signal paths are reduced
 - c) Probability of collisions is increased
 - d) Interference is reduced
2. Which of the following is known as Non Radiative region?
 - a) Far field region
 - b) Near field region
 - c) Radiative Field
 - d) Reactive Field
3. Log periodic antenna uses which range of frequencies.
 - a) VHF and UHF
 - b) VHF and SHF
 - c) MF and VHF
 - d) HF and VHF
4. Which of the following statement is false?
 - a) LPDA is a frequency independent antenna
 - b) In LPDA the lengths of the dipoles increases from the apex of the feed line toward other end
 - c) The included angle varies as the length of the dipole changes from the apex of feed line
 - d) The spacing between adjacent dipoles and their lengths are in same ratio
5. What is the radiation pattern of a Yagi-Uda antenna?
 - a) Broad-side
 - b) End-fire
 - c) Collinear
 - d) Both Broadside and End-fire
6. Sky wave propagation reflects the frequencies _____ .
7. In order to get more number of channels in TV reception, we prefer Yagi-Uda than LPDA. State True or False
8. Near field is also known as inductive field. State True or False.
9. Communication through LOS can be increased by decreasing the height of antenna. State True or False.

10. In Smart antennas, signal to interference ratio is low. State True or False.
11. State Hyugen's principle.
12. Explain the term: Duct propagation.
13. What is Babinet's principle in antenna?
14. What is the basic concept of reflector antenna?
15. What is use of Woodward-Lawson method in antenna array?

Q.2 Answer the following questions. (Attempt any three) **(15)**

- A) What are the specific features of troposcatter propagation?
- B) Explain the terms : (1) Beam Solid Angle, (2) Antenna Temperature, (3) Reciprocity of antenna.
- C) What is the maximum effective aperture and gain of a microwave antenna with directivity of 900 operating at 8 GHz?
- D) Compare flat reflector and corner reflector.

Q.3 A) Explain features, types of feeding structure and application on Micro-strip antenna. **(07)**

B) Compare End-fire and broadside array of antenna. **(08)**

OR

B) Derive Friis transmission formula. **(08)**

Q.4 A) Discuss the construction and design of a Yagi-Uda array **(07)**

OR

A) Define the following parameters and their dependence an antenna performance **(07)**

- Radiation pattern
- Input Impedance
- Polarization.

B) A join dipole of $\lambda/2$ long? If it has loss resistance of 2Ω , **(08)**

calculate : (i) Directivity, (ii) Gain, (iii) Effective Aperture, (iv) Beam Solid Angle and (v) Radiation Resistance.