Dr Naveen

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-2 EXAMINATION- Oct 2019

B.Tech 7th Semester

COURSE CODE: 16B1WEC831 MAX. MARKS: 25

COURSE NAME: Antenna & Wave Propagation

COURSE CREDITS: 3 MAX. TIME: 1.5 Hr.

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

1. What is the need of antenna arrays? How distance among antenna elements, relative amplitude and phase can control the radiation pattern of hertz dipole antenna array. [CO-3, 4; 5 Marks]
2. Derive and explain antenna reciprocity theorem. What are the limitations of this theorem? [CO-1, 2; 5 Marks]
3. Plot the radiation patterns for:
   (i) Array of two elements with equal amplitude and same phase.
   (i) Array of two elements with equal amplitude and opposite phase.
   [CO-1, 4; 5 Marks]
4. A Z-oriented Hertz dipole of length 10 cm is excited with a sinusoidal current of amplitude 20 A and Frequency 10 MHz. Find the instantaneous electric field at a distance of 1 meter along the x-axis at 1 micro second. Also, find the orientation of Electric field. [CO-2,4; 5 Marks]
5. What is the maximum power received at a distance of 0.5 km over a free space 1 GHz circuit consisting of a transmitting antenna with a 25 dB gain and a receiving antenna with a 20 dB gain? The gain is with respect to lossless isotropic source. The transmitting antenna input is 150W. [CO-3,4; 5 Marks]