

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- Feb 2019

B.Tech 8th Semester

COURSE CODE: 13B1WEC832

MAX. MARKS: 15

COURSE NAME: Modern Antennas

COURSE CREDITS: 3

MAX. TIME: 1 Hr.

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

1. Derive the expressions for the near and far field components of Hertz dipole? Calculate the radiation resistance and total power radiated by this antenna. [CO-1,2; 4 Marks]
2. Define antenna reciprocity theorem. What are the limitations of this theorem? [CO-1; 2 Marks]
3. Define antenna directive gain and power gain. What is the significance of power gain? [CO-1; 2 Marks]
4. Define antenna directivity, effective aperture and radiation resistance. [CO-1; 3 Marks]
5. 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; 2 Marks]
6. 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-1; 2 Marks]