JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-1 EXAMINATION -SEPTEMBER 2018

Ph.D 1st Semester (PMS)

COURSE CODE: 15P1WPH215   MAX. MARKS: 15

COURSE NAME: MICROSTRIP ANTENNA DESIGN

COURSE CREDITS: 03   MAX. TIME: 1 Hr

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

1. The radiation intensity of an antenna is given by $U(\theta, \emptyset) = cos^4\theta sin^2\emptyset$ for $0 \le \theta \le \frac{\pi}{2}$ and $0 \le \emptyset \le 2\pi$ (in the upper half). It is zero in the lower half. Find directivity (dimensionless and in dB) and HPBW in degrees.

                                 (3)

2. What is antenna polarization and derive the relation for linear and elliptical polarization in antennas. Also explain under which conditions the circular polarization is achieved?

                                 (4)

3. Prove that Poynting vector is directly responsible for radiation power density.

                                 (2)

4. An antenna has maximum effective aperture of 2.1 square meter at its operating frequency of 100 MHz with no conduction and dielectric losses. The input impedance of the antenna is 75 ohms, it is connected to 50 ohm transmission line. Find the directivity of the antenna system

                                 (3)

5. For an X band rectangular horn with aperture dimensions of 5 cm and 7.1 cm, find its maximum effective aperture in square cm when the isotropic gain is (i) 14.8 dB at 8.2 GHz, (ii) 16.5 dB at 10.3 GHz, (iii) 18 dB at 12.4 GHz

                                 (3)