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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST - 2 EXAMINATION - 2026

B.Tech-VI Semester (ECE)

COURSE CODE(CREDITS): 18B1WEC742(3) MAX. MARKS: 25

COURSE NAME: Antenna and Wave Propagation

COURSE INSTRUCTOR: Salman Raju Talluri MAX. TIME: 1 Hour 30 Min.

Note: (a) All questions are compulsory. (b) The candidate is allowed to make suitable numeric assumptions wherever required for solving problems. (c) Use of calculator is allowed.

Q.No	Question	CO	Marks
Q.1	Explain the single step and double step procedure(using potentials) for computing fields radiated by electric and magnetic sources. Why do we prefer two step procedure over the single step procedure?	CO-2	4
Q.2	Derive the expression for H_ϕ for infinitesimal dipole antenna. Draw neat digrams indicting the current distribution and geometry of the antenna.	CO-2	4
Q.3	The far-field radiation of a half-wavelength dipole antenna is given by $$E_\theta \approx j\eta \frac{I_0 e^{-jkr}}{2\pi r}\left[\frac{\cos\left(\frac{\pi}{2}\cos\theta\right)}{\sin\theta}\right]$$ Determine the radiation intensity U of the antenna and determine its total power radiated in order to find out the directivity.	CO-2	4
Q.4	What do you mean by pattern multiplication theorem? What is the significance of it?	CO-3	4
Q.5	Give the mathematical expression for current distribution on a finite length dipole antenna. Using this expression, draw the current distribution for a short dipole antenna, half wavelength dipole antenna and a dipole antenna with a length of 2λ	CO-3	4
Q.6	Give the properties of the given objects for comparison purpose. a. Perfect Electrical Conductor and Perfect Magnetic Conductor. b. Free space characteristics. c. Aperture antenna and and Dipole antenna.	CO-1	5