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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- Sep 2019

Ph.D. 1st Semester

COURSE CODE: 18M1WEC331   MAX. MARKS: 15

COURSE NAME: Computational Electromagnetics

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. An air-filled circular waveguide has a radius of 2 cm and is to carry energy at a frequency of 10 GHz. Find all the TE_{np} and TM_{np} for which energy transmission is possible.

    [CO-1; 4 Marks]

2. Calculate the total no. of modes of propagation for frequencies below 20 GHz with guide radius of 1 cm.   [CO-1; 3 Marks]

3. Calculate the ratio of circular waveguide cross-sectional area to Rectangular waveguide cross-section. Assuming that both these waveguides have similar or equal cutoff frequencies or wavelength for TE modes.   [CO-1; 5 Marks]

4. An air-filled RWG of inside dimensions 7*3.5 cm operates in the dominant mode:

    (a) Find the cut-off frequency.

    (b) Determine the phase velocity of the wave in the guide of 3.5 GHz.

    (c) Determine the guided wavelength at the same frequency.

    [CO-1; 3 Marks]