COURSE CODE: 18M1WEC331   MAX. MARKS: 15

COURSE NAME: Computational Electromagnetics

COURSE CREDITS: 3   MAX. TIME: One Hr

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

1. Calculate the ratio of Circular waveguide cross sectional area to rectangular waveguide cross sectional area for TE modes. Assume that TE dominant mode of rectangular waveguide has equal cut off frequency as that of TE dominant mode of circular waveguide.   [CO-1; 3 Marks]

2. Derive the expressions of Electric and Magnetic field components for TM mode in circular waveguide.   [CO-1; 5 Marks]

3. Calculate the total number of modes in of propagation for frequencies below 20GHz with the guide radius of 1 cm.   [CO-1; 3 Marks]

4. When a dominant mode is propagating in an air filled rectangular waveguide, the guide wavelength for a frequency of 9000 MHz is 4 cm. Calculate the breadth of the waveguide.   [CO-1; 2 Marks]

5. Draw the method of excitation of following modes inside a circular waveguide:

   TE_{11}, TE_{21}, TE_{22}, TM_{01}, TM_{11}, TM_{21} and TM_{22} [CO-1; 2 Marks]