JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- Oct 2018

Ph.D 1st Semester

Dr. Naveen Jaglan

COURSE CODE: 18M1WEC331 MAX. MARKS: 25

COURSE NAME: Computational Electromagnetics

COURSE CREDITS: 3 MAX. TIME: One Hr 30 Min

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

1. A TE_{11} mode is propagating through a circular waveguide. The radius of the guide is 5 cm and the guide contains air dielectrics:

   (a) Determine the cut-off frequency.

   (b) Determine the wavelength λ_g in the guide for an operating frequency of 3 GHz.

   (c) Determine the wave impedance Z_g in the guide. (CO-1, 2 Marks)

2. What is Finite Differencing Method (FDM). Explain in detail forward, backward and central differencing. (CO-2, 5 Marks)

3. What is Berenger's PML. How it is designed to absorb EM waves? (CO-2, 5 Marks)

4. What are Maxwell's FDTD and FDFD systems? Explain their advantages and disadvantages? (CO-3, 5 Marks)

5. Discuss different Boundary conditions used in Computational Electromagnetics. (CO-3, 4 Marks)

6. Show the top view and side view of the behavior of electric and magnetic fields with in a rectangular waveguide for dominant mode. (CO-1, 2 Marks)

7. Explain why TEM waves does not exist in parallel plane waveguides but exists in rectangular waveguides? (CO-1, 2 Marks)