**Karunya University**

**(Karunya Institute of Technology and Sciences)**

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examinations – June 2016**

**Subject Title: TRANSMISSION LINES AND WAVEGUIDES Time : 3 hours**

**Subject Code: 14EC2007 Maximum Marks: 100**

**Answer ALL questions (5 x 20 = 100 Marks)**

1. A generator of 1.0V, 1000 cycles, and supplies power to a 100 mile open wire line terminated in 200Ω resistance. The line parameters are: R = 10.4 Ω/mile, L = 0.00367 H/mile, G = 0.8 × 10-6 mho/mile, C = 0.00835 μf/mile

Calculate

a. Characteristic Impedance Z0

b. Propagation Constant γ

c. Magnitude of Reflection co-efficient

d. Sending end current

e. Receiving end current

f. Input Power

g. Delivered power

h. Power Efficiency

**(OR)**

2. a. Derive the condition for a distortion less transmission line. (10)

b. Analyze the waveform distortion present in an ordinary telephone cable. (10)

3. Discuss how impedance matching is done using transmission line sections.

**(OR)**

4. Discuss in detail how impedance is matched in a transmission line using single stub matching. Derive the expressions for

a. Length of the stub

b. Position of the stub

5. Derive the general field solutions of Waves Between Parallel Planes of Perfect Conductors.

**(OR)**

6. Let us assume that, between parallel conducting plates, the E field and H field are perpendicular to each other and both of them are perpendicular to the direction of propagation also. Which type of electromagnetic wave is this? Find the following for this electromagnetic wave if air is the dielectric medium between the parallel conducting plates.

a. Propagation constant, γ

b. Phase constant, β

c. Velocity of propagation,

d. Cutoff frequency,fc

e. Wave Impedance

7. Discuss about the attenuation factor of TE and TM Waves in Parallel Waveguide.

**(OR)**

8. Discuss about transverse electric waves in a rectangular waveguide.

**Compulsory:**

9. a. Why TEM mode does not exist in a rectangular waveguide? (4)

b. Discuss about (16)

i. Rectangular Cavity Resonator

ii. Circular Cavity Resonator

iii. Microstrip Lines

iv. Coplanar waveguides