Code: EC5T2

III B.Tech - I Semester – Regular/Supplementary Examinations October 2017

TRANSMISSION LINES AND WAVE GUIDES
(ELECTRONICS AND COMMUNICATION ENGINEERING)

Duration: 3 hours   Max. Marks: 70

PART – A

Answer **all** the questions.   All questions carry equal marks

11x 2 = 22 M

1.
   a) Define characteristic Impedance of a two wire Transmission line.
   b) What is Skin effect of a material?
   c) Define Standing waves.
   d) Mention the relation between input impedance of an open and short circuited line and its characteristic Impedance.
   e) All the outer circles of the Smith represents same information of a transmission line what is it?
   f) If I move on the smith chart from Psc to Poc vice versa what will be length of the line I can cover (where Psc : point of Short circuit and Poc: point of open circuit)?
   g) What exactly mode represents in a rectangular wave guide?
   h) What is the significance of Equation of continuity in Maxwell's equations?

i) The resonance frequency of cavity depends on what factors?

j) What is the mode of propagation of Electromagnetic wave in micro strip and strip lines?

k) Mention the expression for the Cutoff frequency of the circular wave guide.

PART – B

Answer any **THREE** questions. All questions carry equal marks.

$$3 \times 16 = 48 \text{ M}$$

2.a) What is the equivalent circuit for the Two wire transmission line? And find its general solution for voltage and current.

10 M

b) A 15Km long transmission line has 75% of its sending end voltage at 10Km from the sending end, what will be the voltage value (% of sending end voltage) at 15 Km from the sending end ?

6 M

3.a) Develop the relation between average power and reflection coefficient on a finite length transmission line.

8 M

b) A certain line of 2m long has Z_0 =60+j40 Ω and it is terminated by its load of 20+j50 Ω find its input impedance, reflection coefficient and standing wave ratio.

8 M

4.a) What are the Different applications of Smith Chart?   8 M

  b) Explain working mechanism of Impedance matching by
     using Quarter wave transformer.   8 M

5.a) What is the Maxwell's contribution to ampere's law ? List
     all the Maxwell's equations both in Integral and
     differential form.   8 M

  b) Compare TE and TM mode of Propagation inside a
     rectangular Waveguides.   8 M

6.a) Define Cavity, Quality factor, dominant mode and its cutoff
     frequency .   8 M

  b) Compare Waveguides and Cavity Resonators.   8 M