Exam.Code:0928
Sub. Code: 33657

2015

B.E. (Electronics and Communication Engineering)

Fourth Semester

EC-408: Electromagnetic Theory

Time allowed: 3 Hours Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit. Use standard notations for derivation.*

x-x-x

I. Attempt the following:-

a) What is SWR?

b) Define Dominant and Degenerative modes.

c) Calculate the width of a waveguide for propagation frequency of 10Ghz.

d) Define current density. Write the relation between current and current density.

e) Define Group Velocity.

f) Differentiate between wave impedance and characteristic impedance.

g) What is Skin depth.

h) State boundary conditions.

i) State Biot Savart Law.

j) Write the formula for cut off wavelength for circular waveguide. (10x1)

UNIT - I

II. a) Discuss the reflection of a EM wave at the surface of perfect conductor .

b) Derive wave equation? State and explain Poynting Theorem and Average Poynting Vector. (5+5)

III. a) Write Maxwell's equations in free space and harmonically varying fields.

b) Derive the relationship for skin depth. (6+4)

IV. a) State Ampere's circuital law and explain any two applications of Ampere's circuital law.

b) Derive the equation to show that curl of magnetic field intensity in equal to current density. (5+5)

P.T.O.

UNIT - II

V. Derive the Field components when wave is propagating in rectangular waveguide with TE mode of propagation. (10)

VI. a) Why TEM waves cannot propagate in waveguides?

b) Derive transmission line Equation. (4+6)

VII. a) The interior of a 6.6 cm × 5 cm rectangular waveguide is completely filled with a dielectric of $\in r$= 4. Calculate the wavelength of free space wave that can be propagated in the TE11 mode. Also calculate the wavelength of dominant mode?

b) Explain Q of a rectangular cavity resonator. (7+3)

x-x-x