

2007-CALICUT UNIVERSITY
B. TECH V SEMESTER DEGREE EXAMINATION
ELECTROMAGNETIC FIELD
(ELECTRICAL AND ELECTRONIC ENGINEERING)

TIME-3HOUR
MARKS-100

ANSWER FULL QUESTIONS

SECTION A 8*5=40 MARKS

- I. (a) Derive an expression for energy stored in a magnetic field.
- (b) Derive the capacitance of an Isolated sphere. Explain the steps.
- (c) What is a magnetic dipole ? Explain with a sketch.
- (d) Explain the types of transmission lines and their applications.-
- (e) What are plane waves, uniform plane waves and plane wave front ? Explain.
- (f) Differentiate Elliptical from circular polarization. Explain their significance.
- (g) Derive standard wave equations from Maxwell's equations.
- (h) explain the concept of brewster angle.obtain an expression for it

SECTION B 4*15=60 MARKS

- (ii)(a) (i) Derive the potential frictions for sinusoidal oscillations.
- (ii) State and derive stokes theorem and divergence theorem.
Or
(M (iy Define Dipole. Obtain an expression for the resultant potential and electric field.
- (8 marks) (ii) Expla in spherical to Cartesian co-ordinates transformation. Obtain the relation.

III. (a) (ty Derive an expression for Inductance of solenoid.

(iiV Derive expressions for conduction current and displacement current densities. $r >$

Or

^ '(b) (i) Derive an expression for Inductance of toroid. •

(ii) Differentiate Self Inductance from Mutual Inductance.

IV. (a) State and derive poynting theorem. Also derive poynting vector for time varying fields. Explain its applications.

Or

(b) (i) Derive an equation that would describe an ellipse for elliptical polarization,

(ii) Obtain Maxwell's equations in differential form.

V. (a) (i) Derive the equations of smith chart.

(ii) Explain the potential apphcations of Smith chart.

Or

(b) (i) Compare the characteristics of co-axial line with 2 wire transmission line,

(ii) Define and explain the significances of:

1 Phase velocity.

2 Group velocity.

3 Characteristic Impedance.