

D 42172

(Pages : 2)

Name.....

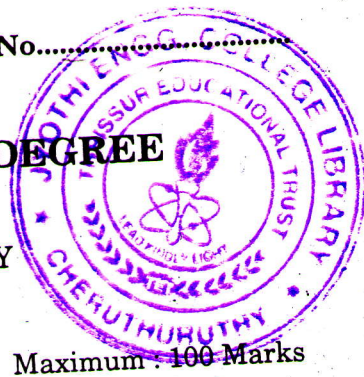
Reg. No.....

**FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, DECEMBER 2007**

EE 04 502 - ELECTROMAGNETIC FIELD THEORY

(2004 admissions)

Maximum : 100 Marks



Time : Three Hours

Answer all the questions.

- I. (a) State and prove Divergence Theorem.
(b) A spherical capacitor consists of an inner conducting sphere of radius 'a' and outer conductor with a spherical inner wall of radius 'b'. The space in between is filled with a dielectric of permittivity ϵ . Determine the capacitance.
(c) Write Biot-Savart's law. Give the expression in case of steady current.
(d) Write the concept of electromagnetic induction.
(e) What is meant by displacement current? Explain.
(f) Write the concept of circular polarization.
(g) Derive wave equations in vacuum.
(h) Write the laws of reflection and refraction. (8 × 5 = 40 marks)
- II. (a) (i) Determine the electric field intensity of an infinitely long, straight, line charge of a uniform density λ in the air.
(ii) Write Gauss law. (10 + 5 = 15 marks)
- Or
- (b) Obtain a formula for the electric field intensity on the axis of a circular disk of radius 'a' that carries a uniform surface charge density σ . (15 marks)
- III. (a) Discuss the boundary conditions for magnetostatic fields.
(b) Derive the expression for magnetic energy. (15 marks)
- Or

Turn over

IV. (a) Derive the wave equations for a conducting medium.

Or

(b) State and derive Poynting theorem.

V. (a) Discuss the concept of stub matching with an example.

(15 marks)

Or

(b) (i) Derive the expression for Brewster's angle.

(ii) Define Group velocity and Standing wave ratio.

(8 + 7 = 15 marks)

[4 × 15 = 60 marks]