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B.E./B.Tech.(Full-Time)DEGREE END SEMESTER EXAMINATIONS,NOV/DEC2011

ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH

THIRD SEMESTER

**EC 271 – ELECTROMAGNETIC FIELDS AND WAVES**

(REGULATIONS 2004)

**Duration: 3 Hours** **Max.marks: 100**

**Answer ALL questions**

**PART-A** **(10x2=20Marks)**

1.State Stoke's theorem.

2.Write the Laplacian in cylindrical co-ordinates.

3.Write the right handed screw rule.

4.Define MMF.

5.Compare energy flow and power flow.

6.Give the three relations for electric energy density.

7.List Maxwell's equations.

8.Write the equation for conduction current.

9.What is meant by Polarization?

10.Define surface impedance.

**PART-B** **(5X16=80 Marks)**

11.State and prove Gauss's law. Explain any two applications. **(16)**

12(a)(i)State and prove Ampere's law. **(6)**

(ii)Describe about the force between two current elements. **(10)**

**OR**

12.(b)(i) Derive the expression for Biot-Savart law. **(8)**

(ii) Discuss briefly on magnetic flux density and magnetic field intensity. **(8)**

13.(a)Derive the boundary conditions for E and H fields respectively. **(16)**

**OR**

13.(b)Explain the capacitance with reference to multi-conductor systems. **(16)**

14.(a)(i) Distinguish between circuit theory and field theory. **(8)**

(ii) Distinguish between self inductance and mutual inductance. **(8)**

**OR**

14.(b)(i)How is Poynting theorem useful for time-varying fields? **(10)**

(ii)State and prove Faraday's law. **(6)**

15.(a) Write the mathematical substantiation of the cases for reflection of a plane wave at normal incidence. **(16)**

**OR**

15.(b) Derive wave equations and give the illustration for plane waves in perfect conductors. **(16)**

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