# D25

## B.Tech. EXAMINATION, May 2019

(Fourth Semester)

(B. Scheme) (Main & Re-appear)

(ECE)

ECE212B

FIELD AND WAVES

*Time :* 3 *Hours*] [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

**Note** : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.



### Unit IV

**7.** (a) Derive the expressions for input impedance and standing wave ratio of transmission lines. **9**

(b) Explain open and short circuit lines. **6**

**8.** (a) Describe briefly about Reflection Coefficient and Transmission Coefficient. **10**

(b) Explain Smith's chart and its application. **5**

## Unit I

**1.** (a) Determine the divergence and curl of the vector $\vec{A} = xa_x + y^2 a_y + y^2 a_z$. **5**

(b) Derive the expression for electric field intensity due to a circular surface charge. **6**

(c) Define dipole moment. **4**

**2.** (a) Apply Gauss's law to an :

(i) Infinite line charge

(ii) Infinite sheet of charge. **9**

(b) Electric field us conservative field. Justify. **6**

## Unit II

**3.** (a) Derive an espression for energy density in a magnetic field. **7**

(b) Derive the expression for magnetic flux density and magnetic field intensity due to an infinitely long conductor. **8**



**4.** Give short notes on the following :

(a) Magnetic Vector Potential

(b) Biot-Savart's Law

(c) Ampere's Law of Force. **20**

## Unit III

**5.** (a) Derive Maxwell equation in point and integral forms. **11**

(b) Write down the magnetic boundary conditions. **4**

**6.** (a) Calculate the intrinsic impedance, the propagation constant and the wave velocity for a conducting medium in which $\sigma$ = 58 ms/m, $\mu_r$ = 1 at a frequency of $f$ = 100 MHz. **10**

(b) Write the wave equations in a conducting medium. **5**