Siliguri Institute of Technology
Department of _____ECE_____
1st Internal Exam – 2021 (Odd Semester)
February– 2021

Semester: 5th	**Group: A & B**
Paper Code: EC 501	**Paper Name:** Electromagnetic Waves
Full Marks: 30	**Time: 1hour**

Answer all questions:

Q1.(Aligned to CO1)

i) $\vec{\nabla}\times\vec{E}=0$ means the electric field **E** is produced by the **5X2=10**

a) Static Charge b) Moving Charge C) E.M induction d) Varying magnetic field

ii) For Conservative field which of the following equations holds good?

a) $\oint \vec{B}.ds=0$ b) $\int \vec{E}.dl=0$ c) $\int \vec{H}.dl=0$ d) $\int \vec{D}.ds=0$

iii) Point Charges Q_1=1nC and Q_2=2nC are at a distance apart. Which of the following statements are incorrect

a) The force on Q_1 is repulsive
b) The force on Q_2 is the same in magnitude as that on Q_1
c) As the distance between them decreases, the force on Q_1 increases linearly
d) The force on Q_2 is along the line joining them

iv) Displacement current can flow through

a) Capacitor b) Inductor. C) resistor d) None of these

v) Divergence of which quantity will be zero

a) **E** b) **D** c) **H** d) **B**

Q2.(Aligned to CO2) **10**

i) What is loss tangent? Derive the expression for intrinsic impedance when the wave is propagating through lossy dielectric.

OR

ii) Prove that the electromagnetic power passing through free space is given by the expression $E\times H \;\; W/m^2$

Q3. (Aligned to CO3) **10**

i) Derive the expression for: **a)** input impedance of a lossless transmission line. **b)** input impedance of a $\frac{\lambda}{4}$ transmission line.

OR

ii) a) Derive the voltage and current equation of two wire transmission line. obtain the expression for Z_0 , α *and* β of a distortion less transmission line.