Hall Ticket No | | | | | | | | | | | Question Paper Code: AECB13

INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

B.Tech IV Semester End Examinations (Regular), November – 2020

Regulation: IARE–R18

ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

Time: 2 Hours **(ECE)** **Max Marks: 70**

Answer any Four Questions from Part A
Answer any Five Questions from Part B

PART – A

1. Write a short note on conduction current, convection current and relaxation time. **[5M]**
2. State and explain Ampere's circuit law. **[5M]**
3. State and prove Poynting theorem. **[5M]**
4. Find the parameters of lossless transmission line. **[5M]**
5. Explain the principle of short circuited termination of transmission line. **[5M]**
6. Write about the reflection and refraction of an oblique incidence. **[5M]**
7. State Faraday's law and write the expression for Maxwell's equation of time varying fields. **[5M]**
8. What is the second Maxwell's equation? Give the relation between E & V? **[5M]**

PART – B

9. Determine the capacitance of a parallel plate capacitor of area S separated by a distance d. Take ϵ as its permittivity. **[10M]**
10. The parallel plates of a capacitor are separated by a distance 'd' having potentials V_0 and 0 respectively.Find the instantaneous potential of the parallel plate. **[10M]**
11. Find the torque developed by a small circular loop of radius 'b' carrying a current 'I' in a uniform magnetic field of flux density B. **[10M]**
12. Explain the procedure to determine the inductance of an inductor. **[10M]**
13. Determine the expressions for reflection coefficient and transmission coefficient for a normal incidence.in a plane dielectric boundary **[10M]**
14. A uniform plane wave with E = $E_x a_x$ propagates in a lossless medium(ϵ_r= 4, μ_r = 1, σ = 0)in the +z-direction. Assume that E is sinusoidal with a frequency(100 MHz) and has a maximum value of $+10^{-4}$V/m at t=0 and z=1/8m. Find magnetic field intensity. **[10M]**
15. Find the inductance, resistance and conductance per unit length of the 100Ω distortion less transmission line of attenuation constant 0.01dB/m. Take Capacitance = 0.2nF/m **[10M]**
16. Find the attenuation constant of a lossy transmission line with distributed parameters R, L, G and C. **[10M]**
17. Write the procedure for double stub matching using Smith chart as an admittance chart. **[10M]**
18. A 50 Ωtransmission line is connected to a load Z_L=35-j47.5Ω.Find the position of the short circuited stub required for impedance matching. **[10M]**

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