



B.Tech III Year I Semester Supplementary Examinations, December 2021

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES
(Electronics and Communication Engineering)

Maximum Marks: 70

Date: 23.12.2021 Duration: 3 hours

Part-A

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 Define the term charge. What are the different types of charges?
- 2 Write the Maxwell's two equations for electrostatic fields?
- 3 State Biot-savart's law.
- 4 State Maxwell's equations for loss less or non-conducting medium.
- 5 Define the term "Uniform plane waves."
- 6 Define Electromagnetic waves.
- 7 List the different types of transmission lines.
- 8 How does group velocity vary when compared to phase velocity?
- 9 Define reflection coefficient.
- 10 What is single stub matching?

Part-B

Answer All the following questions.

(5X10M=50Marks)

11. What are the different types of current densities and define them? (10M)
OR
12. a). Define Electric potential and Derive the relationship between Electric field and Electric potential? (5M)
b). Derive the "Poisson's and Laplace's" equation and mention their applications? (5M)
13. Explain Biot-Savart's law and find magnetic field intensity in infinite line current distribution? (10M)
OR
- 14 a). What is the inconsistency of Ampere's law? (5M)
b). Give the word statement for all Maxwell's equations? (5M)
15. State and Prove the Poynting theorem? (10M)
OR
- 16 a). Obtain the wave reflection by perfect conductor with normal incidence. What is Brewster angle? (5M)
b). What is polarization? Explain different types of polarization? (5M)

17. Derive and explain the condition for minimum attenuation? (10M)

OR

18. Derive secondary constants of Transmission line? (10M)

19.a). Write short notes on UHF lines as circuit elements? (5M)

b). If a transmission line of characteristic impedance is 50 ohms is terminated in complex impedance $25+j100 \Omega$. Find the reflection coefficient and VSWR of the line? (5M)

OR

20. Explain reflection coefficient and VSWR of a transmission line? (10M)