

Reg. No. :

--	--	--	--	--	--	--	--	--	--

Question Paper Code: 35404

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

Third Semester

Electronics and Communication Engineering

01UEC504- TRANSMISSION LINES AND WAVEGUIDES

(Regulation 2013)

Duration: Threehours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Draw the frequency response characteristics of constant K low pass filter.
2. Define decibel. Calculate the P (mW) for a gain of $-30dbm$.
3. State distortion less line and mention the condition for a distortionless line.
4. Define deflection coefficient.
5. What is need for smith chart?
6. Define SWR.
7. Define characteristic impedance.
8. Distinguish between TE and TM waves.
9. Find Q factor of a cubic cavity resonator whose surface resistance is 1×10^{-2} ohms.
10. Define resonant cavities..

PART - B (5 x 16 = 80 Marks)

11. (a) Derive the characteristic impedance and propagation constant of a symmetrical T-Network. (16)

Or

- (b) Design m-derived LPF, having $af_c = 5000\text{Hz}$ and a design impedance of $600\ \Omega$. The frequency of infinite attenuation is $1.25f_c$. (16)

12. (a) A transmission line is 2miles long operates at 10KHz and has parameters $R=30\ \Omega/\text{mile}$, $C=80\text{nF}/\text{mile}$, $L=2.2\text{mH}/\text{mile}$, and $G=20\text{nV}/\text{mile}$. Find the characteristics impedance, propagation constant, attenuation and phase shift per mile. (16)

Or

- (b) Derive the general transmission line equation for voltage and current at any point on a line. (16)

13. (a) (i) Discuss the various parameters of open wire and coaxial line at radio frequency. (8)
(ii) Explain about smith chart and its application. (8)

Or

- (b) (i) Obtain the input impedance of a Quarter wave line and Half wave line and write about its application. (8)
(ii) Illustrate the input impedance of open and short circuited dissipation-less transmission line. (8)

14. (a) (i) Derive the field expression of TM waves guided by a parallel conducting plane. (8)
(ii) Discriminate the characteristics of TEM waves. (8)

Or

- (b) Derive the expression for E and H fields, if electromagnetic wave propagates in Z -direction between two parallel plates. (16)

15. (a) Derive the field expression of TM wave propagation in rectangular waveguide stating the necessary assumption. (16)

Or

- (b) Discuss in detail about attenuation of TE mode in cylindrical waveguide. (16)