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5E3110-Q

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B. Tech. (Sem. V) (Main/Back) Examination, December - 2011
Electronics & Communication
5EC3 Telecommunication Engg.

Time : 3 Hours] [Maximum Marks : 80
[Min. Passing Marks : 24

Instructions to Candidates :

*Attempt any **five questions** selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL 2. NIL

UNIT - I

1 (a) Prove that a finite transmission line terminated in its characteristic impedance behaves as a infinite transmission line. 8

(b) A transmission line has the following per unit length parameters, R = 5Ω, L = 0.1 μH, C = 300 pF, G = 0.01 mho. Calculate the propagation constant and characteristic impedance of the line at 500 MHz, obtain the same parameters for the lossless line. 8

OR

1 (a) Impedance measurements made on a 0.25 km field quad cable at 1600 Hz under open and short circuit conditions gave $Z_{oc} = 2460 \angle -86.3^{\circ}$ and $Z_{sc} = 215 \angle 14^{\circ}$ Ω results. Calculate Z_o, α, β and line parameters per unit length of line. 8

(b) Describe the types of losses that may occur with high frequency transmission lines. 8

UNIT - II

2 (a) What is stubs ? Describe the single and double stubs phenomena in transmission line. 8

(b) A lossless transmission line with characteristic impedance 75 Ω and of electrical length 0.3λ is terminated with load impedance of (40 + j20) Ω. Determine the reflection coefficient of load, SWR of line and input impedance of the line. 8

OR

2 (a) Derive the relationship between standing wave ratio and the reflection coefficient. 8

(b) Describe the properties and application of Smith chart used in transmission line. 8

UNIT - III

3 (a) Derive the characteristic impedance and propagation constant of bridge-T phase equalizer network. 8

(b) Design a minimum loss attenuator to match between 70 Ω and 50 Ω line. Determine the value of loss produced by the network. 8

OR

3 (a) Design m-derived T-type low pass filter to work into load of 500 Ω and cut-off frequency at 4 kHz and peak attenuation at 4.5 kHz.

8

(b) For band pass filter show that series and shunt arm resonant frequency is the geometric mean of two cut-off frequencies 'f_1' and 'f_2' deciding pass band.

8

UNIT - IV

4 (a) Draw and explain the signalling tones used in telephone.

8

(b) A four wire circuit has an overall loss of 1 dB and the balance return loss at each end is 6 dB. Find, the singing point, stability margin and attenuation of talker and listener echo.

8

OR

4 (a) Draw and explain the working of electronic telephone system.

8

(b) Compare TDM and FDM, suggest which multiplexing system being used in general and why ?

8

UNIT - V

5 (a) Describe trunking diagram of 10,000 line exchange.

8

(b) Compare single stage and multistage switching network used in communication system. 8

OR

5 (a) Write short note on Stored Program Control. 8

(b) Describe the EPABX system used for communication system. 8