

5E3110-Q

Roll No. : _____

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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, $R = 5 \Omega$, $L = 0.1 \mu H$, $C = 300 \text{ pF}$, $G = 0.01 \text{ mho}$. 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 $Z_{sc} = 215 \angle 14^\circ \Omega$ results. Calculate Z_0 , 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.

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UNIT - II

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

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

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OR

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

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

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UNIT - III

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

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

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OR

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

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- (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.

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UNIT - IV

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

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- (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.

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OR

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

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

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UNIT - V

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

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

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OR

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

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

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