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| <b>5E5023</b>  | Roll No | <b>5E5023</b> | Total No of Pages: <b>4</b> |
| <p><b>B. Tech V Sem. (Main/Back) Exam. Nov-Dec. 2015</b><br/> <b>Electronics &amp; Communication Engineering</b><br/> <b>5EC3A Telecommunication Engineering</b></p> |         |               |                             |

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks Main: 26**

**Min. Passing Marks Back: 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.*

1. NIL

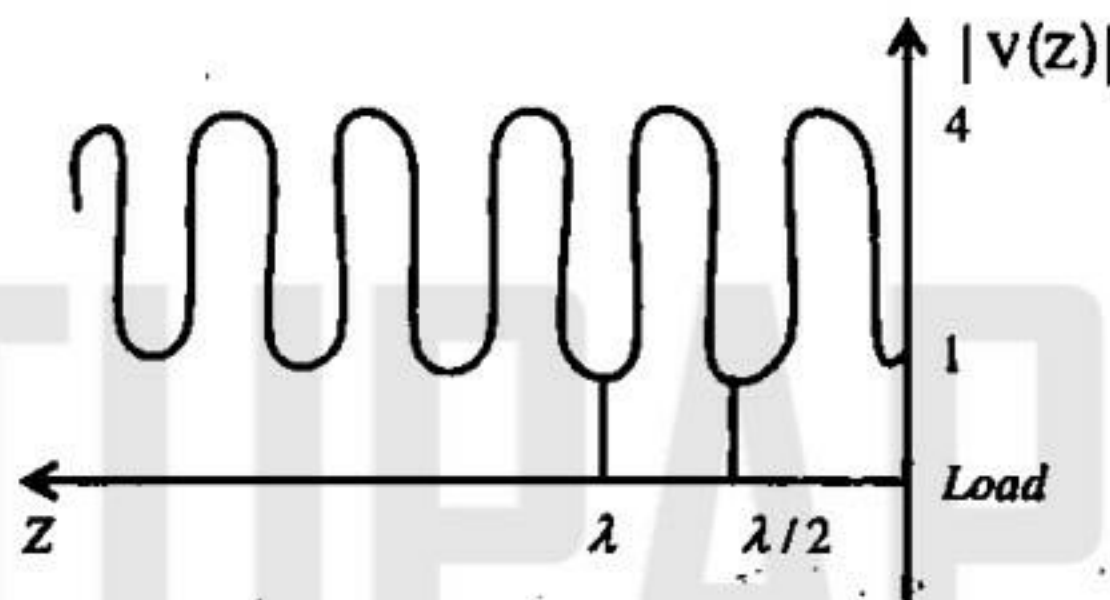
2. NIL

### UNIT-I

Q.1 (a) Voltage standing wave pattern in a lossless transmission line with characteristics impedance  $50\Omega$  and a resistive load is shown in figure.

Calculate the value of load resistance and reflection coefficient.

[8]



(b) What is the meaning of standing wave patterns? Explain it for lossless transmission line and for transmission line with attenuation.

[8]

OR

Q.1 (a) Explain the characteristics of transmission line at Radio frequencies and calculate the characteristic impedance. [8]

(b) A 20 km long transmission line operating at 500MHz has following primary constants  $R=0.5\Omega/m$ ,  $L=250nH/m$ ,  $C=100Pf/m$ ,  $G=10^{-6}S/m$ . All constants are assumed to be independent of frequency.

Calculate characteristic impedance, attenuation coefficient ( $\alpha$ ) and phase coefficient ( $\beta$ ) for the line. [8]

UNIT-II

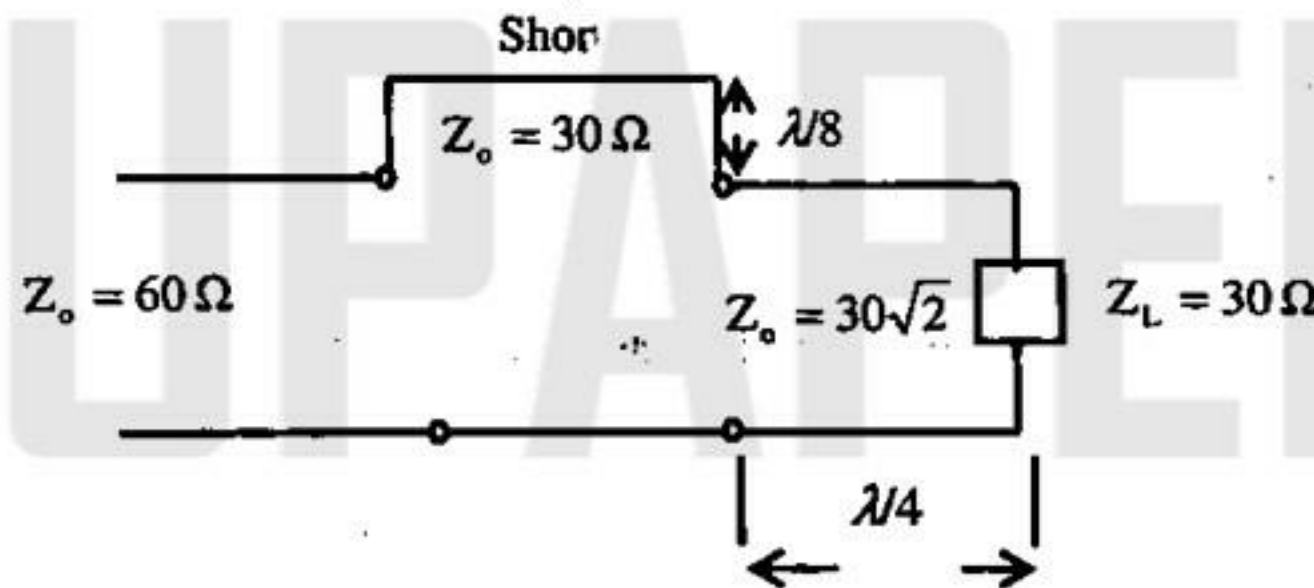
Q.2 (a) What do you mean by matching of transmission line? Explain the method of single and double stub matching with neat diagram. [9]

(b) An open wire R.F. transmission line (loss free) has a  $Z_o = 600\Omega$ , is connected to resistive load of  $100\Omega$ . Find the position and length of short circuited stub, if frequency is 150 MHz. [7]

OR

Q.2 (a) Draw a block diagram of a setup for measurement of attenuation and insertion loss of transmission line and explain briefly. [10]

(b) In the circuit shows all the transmission line section are lossless. Calculate the VSWR for the  $60\Omega$  line [6]



### UNIT-III

- Q.3 (a) Draw a 'T' and ' $\pi$ ' section of a prototype high pass filter and explain the parameters ' $\alpha$ ' and ' $\beta$ '. [10]
- (b) Design a 'T' and ' $\pi$ ' section constant 'K' high pass filter having cut off frequency of 10KHz with impedance  $R_o = 500\Omega$ . Find the - [6]
- (i) Characteristics impedance and phase constant at 20KHz
- (ii) Attenuation at 5KHz

OR

- Q.3 (a) Explain a symmetrical lattice attenuator. Write its design equations in terms of characteristics impedance and attenuation factor. [8]
- (b) Calculate the elements value of a  $\pi$ -type attenuator to be inserted between  $500\Omega$  impedance for an attenuation of 50dB. [8]

### UNIT-IV

- Q.4 (a) What are the main sources of "NEXT" and "FEXT" in telephone systems? How they are controlled? Explain in detail. [8]
- (b) Explain the working of two wire and four wire repeaters and compare both of them. [8]

OR

- Q.4 (a) Determine -
- (i) Lost traffic and
- (ii) Grade of service provided by five switches arranged in full availability group when traffic offered in 0.9 traffic units. [8]
- (b) With the help of neat diagram explain the working of echo cancellers. [8]

**UNIT-V**

Q.5 Write short notes on any two -

[8×2=16]

- (a) STS and TST switching
- (b) EPABX and SPC Digital telephone exchange.
- (c) Signaling in telephone systems.

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