Unit-V

Travelling Wave

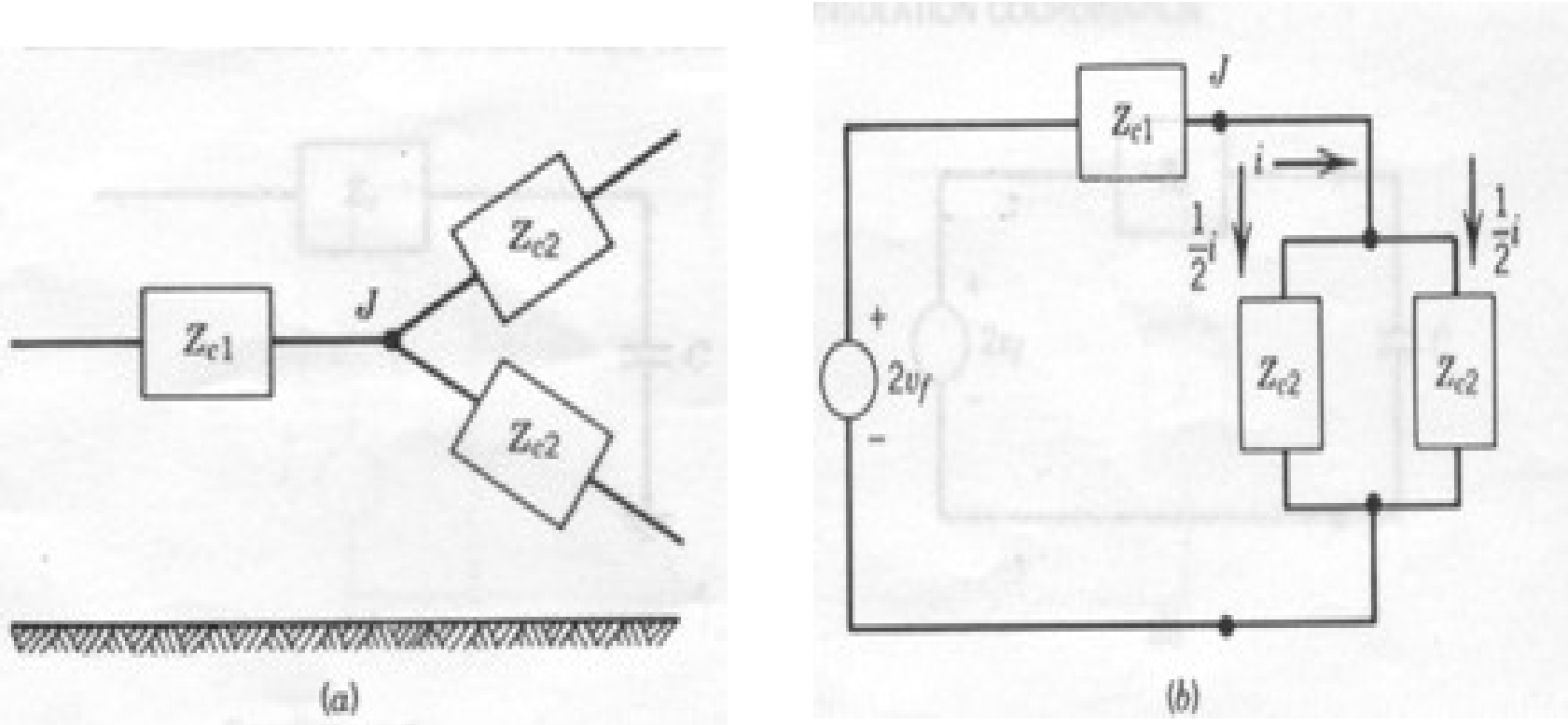
Junction of Several Line

Example:

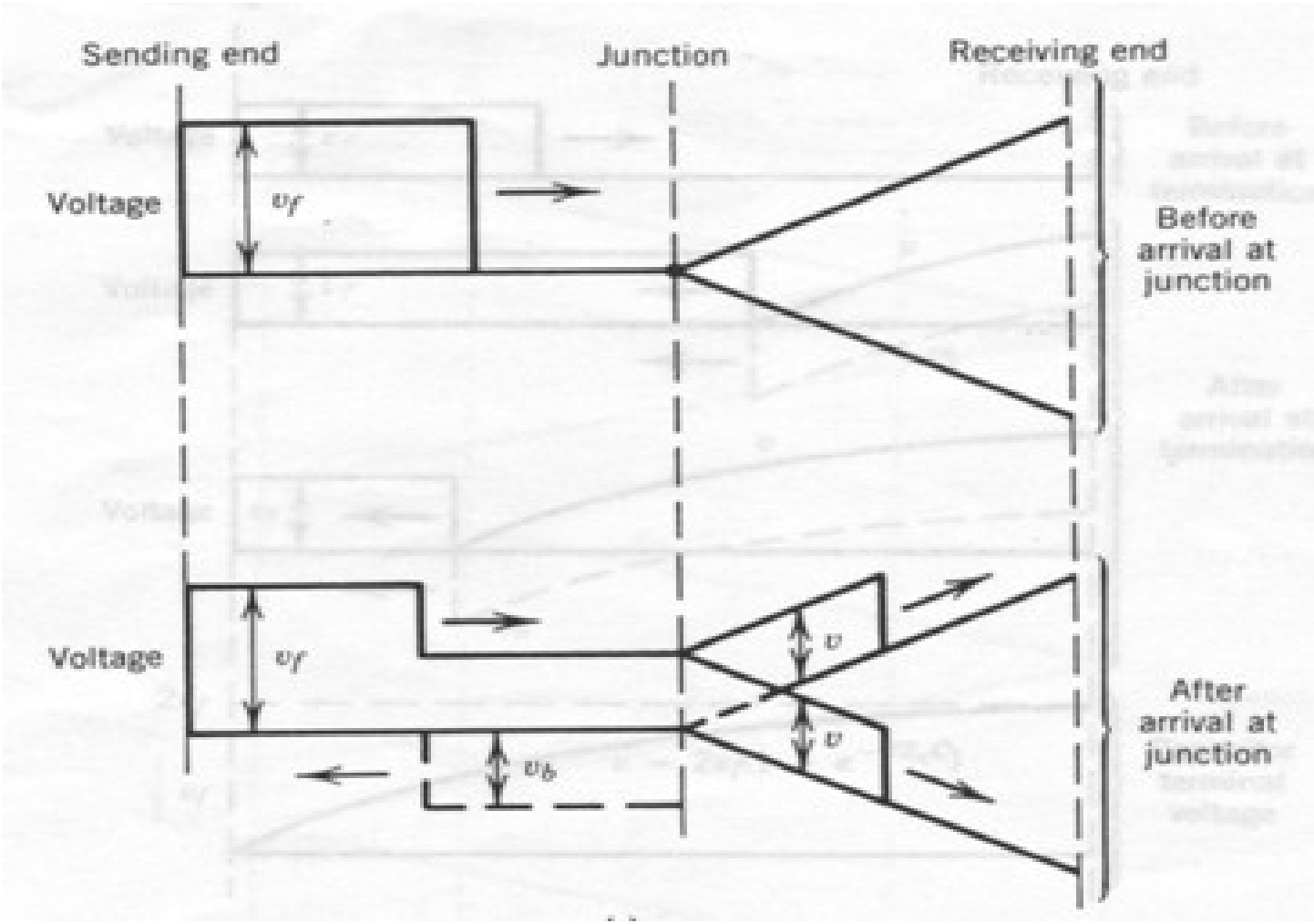
$$v = \frac{2v_f}{Z_{c1} + Z_{c2}/2} \frac{Z_{c2}}{2}$$

$$v = \frac{2Z_{c1}}{Z_{c1} + Z_{c2}/2} i_f$$

$$i_f = \frac{2v_f}{Z_{c1} + Z_{c2}/2}$$



Travelling voltage wave encountering line bifurcation (a) system, (b) Equivalent circuit



Travelling voltage wave reflected and transmitted at junction of three lines

Effect of cable on Surge

- The reflected wave at a junction

$$e_r = \frac{2Z_2}{Z_1 + Z_2} e_f$$

- Characteristics Impedance of a line Z_1= 200-500 ohm
- Characteristics Impedance of a cable Z_2= 30-50 ohm

Contd…

- If line is terminated with cable

  $e_t = 60/330 * e_f$

- If line is terminated with line

  $e_t = 600/330 * e_f$

- The transmitted wave is much lesser than in case of line terminated with cable.

Bewley Lattice Diagram

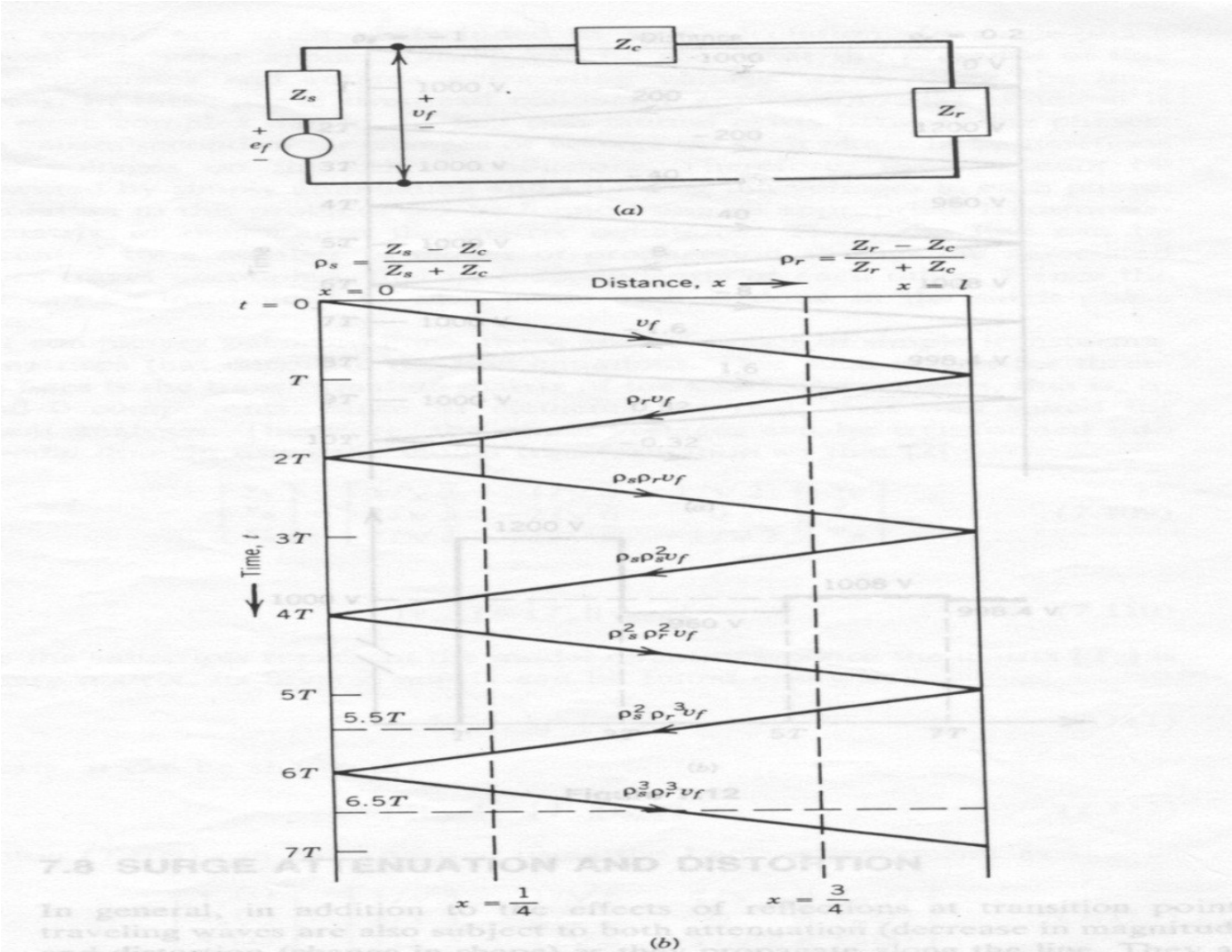
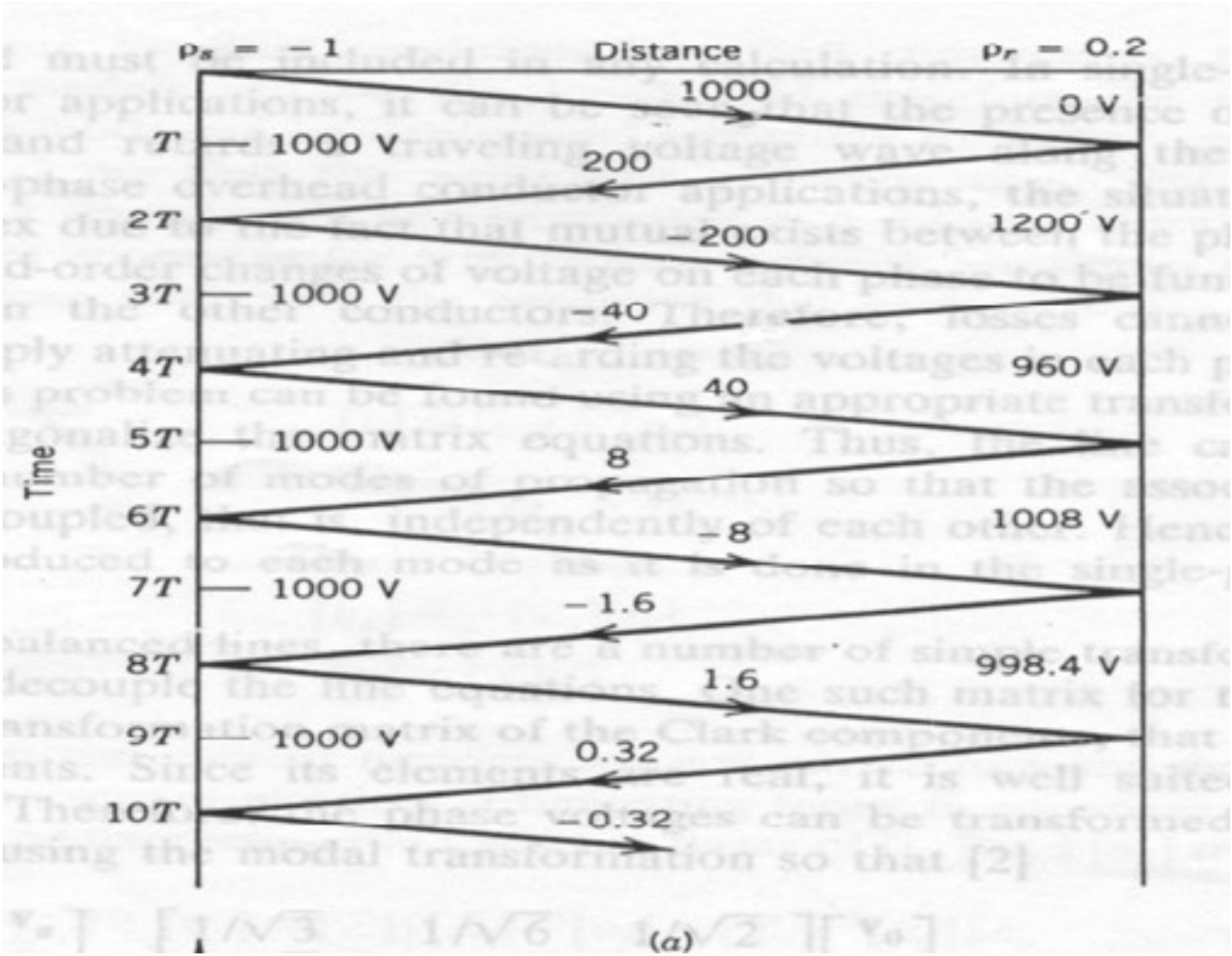
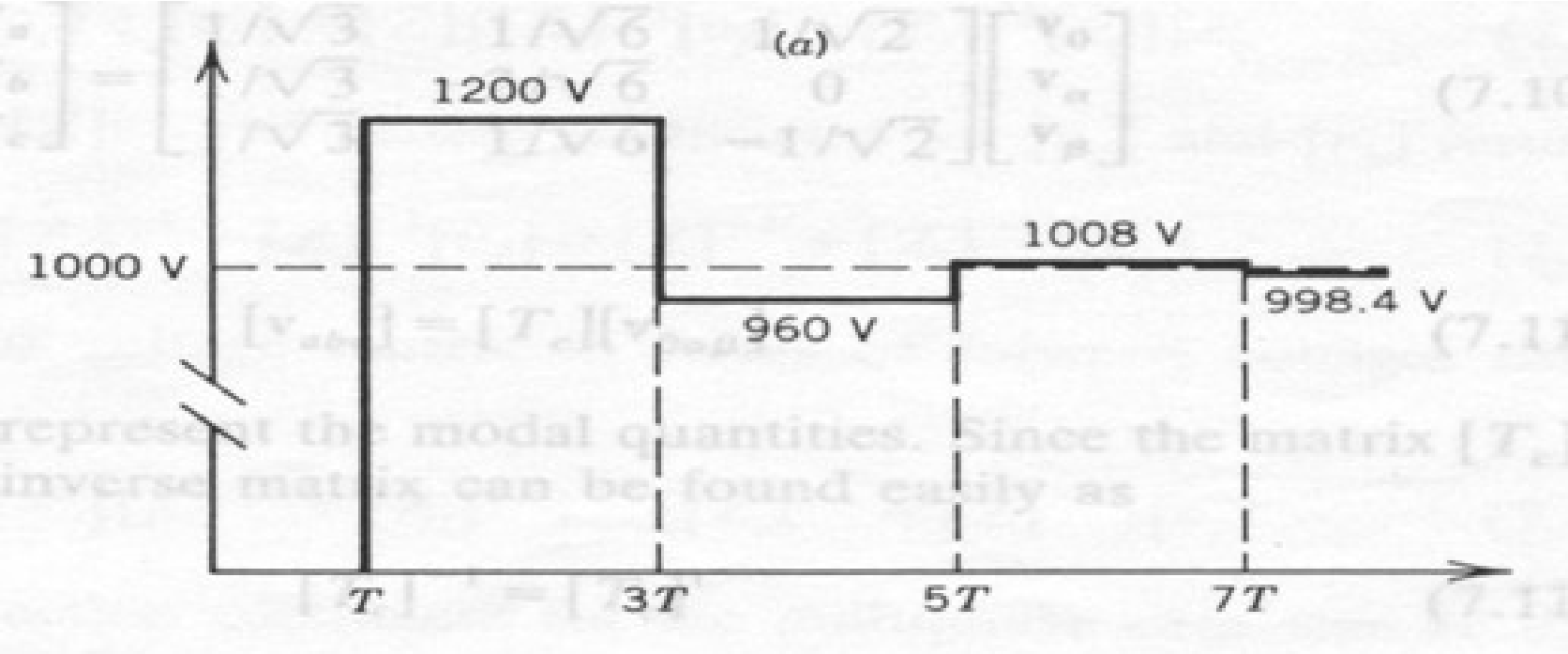


Figure 7.11. Bewley lattice diagram: (*a*) circuit diagram; (*b*) lattice diagram.


$\rho_s = -1$
Distance
$\rho_r = 0.2$
Time
T
2T
3T
4T
5T
6T
7T
8T
9T
10T
1000 V
1000 V
1000 V
1000 V
1000
0 V
200
1200 V
−200
−40
960 V
40
8
1008 V
−8
−1.6
998.4 V
1.6
0.32
−0.32
(a)


(a)
1200 V
1000 V
1008 V
998.4 V
960 V
T
3T
5T
7T

Thanks