

solved problems

3

$$1) \begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} & & \\ & & \\ & & \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$

eigenvalues are  
eigenvalues of

$$\lambda_1 = 2$$

$$\lambda_2 = 4$$

$$\lambda_3 = 6$$

Draw  $x_1(t)$ , (approximate graph is required)

$$2) \begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} & & \\ & & \\ & & \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$

eigenvalues are

$$\lambda_1 = -2$$

$$\lambda_2 = 3 + 4i$$

$$\lambda_3 = 3 - 4i$$

Draw  $x_1(t)$  (approximate graph is required)

$$3) \begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \\ \dot{x}_4 \end{bmatrix} = \begin{bmatrix} & & & \\ & & & \\ & & & \\ & & & \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix}$$

$$\lambda_1 = 3i$$

$$\lambda_2 = -3i$$

$$\lambda_3 = 10i$$

$$\lambda_4 = -10i$$

Draw  $x_1(t)$

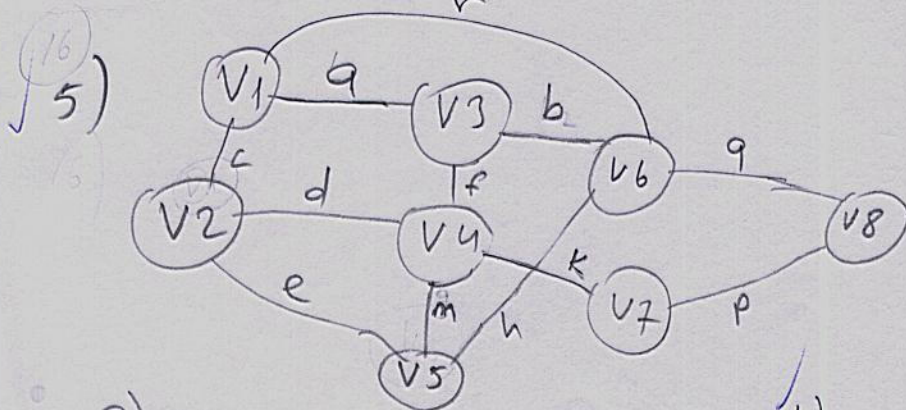
$$4) \begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \\ \dot{x}_4 \end{bmatrix} = \begin{bmatrix} & & & \\ & & & \\ & & & \\ & & & \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix}$$

$$\lambda_1 = -1 + 3i$$

$$\lambda_2 = -1 - 3i$$

$$\lambda_3 = -2 + 10i$$

$$\lambda_4 = -2 - 10i$$



a) ass

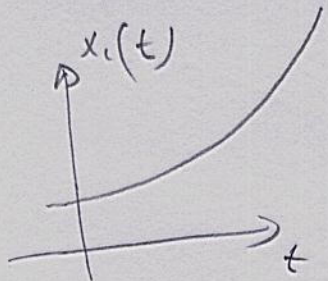
a) assume that all  
length are equal, and  
find the shortest path  
from  $V_1$  to  $V_7$

b)  $a=10$   $b=20$   $c=15$   $d=25$   $e=10$   
 $f=18$   $m=8$   $h=12$   $k=20$   $p=5$

minimum length calculate shortest  
between  $V_1 \rightarrow V_8$   $V_1 \rightarrow V_7$

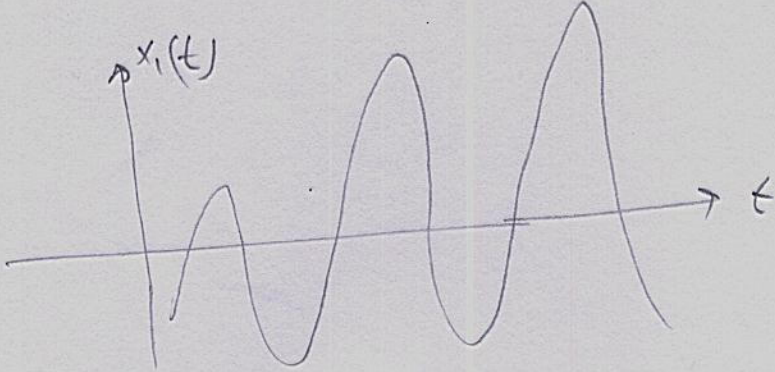


1)

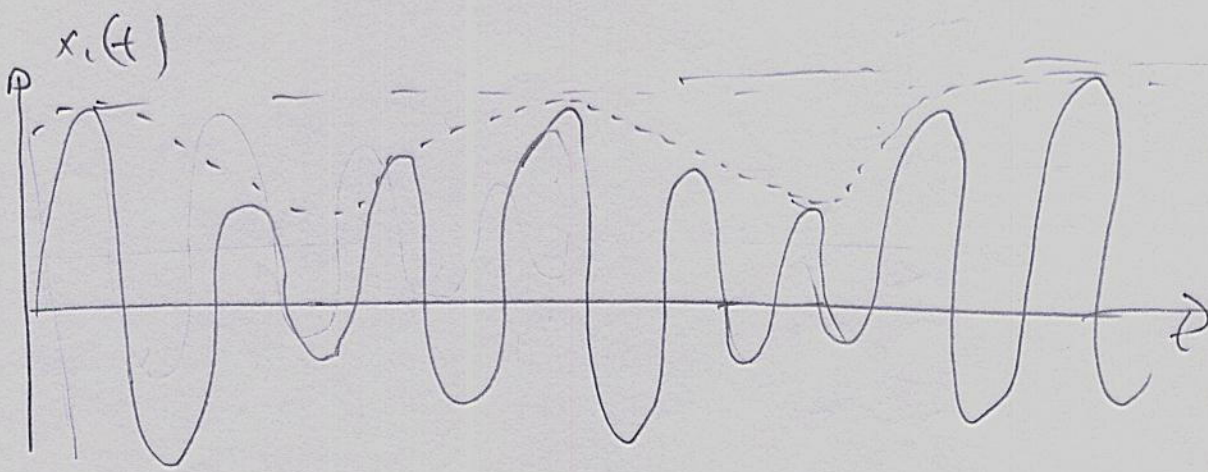


$$\begin{aligned}\lambda_1 &= 2 \\ \lambda_2 &= 4 \\ \lambda_3 &= 6\end{aligned}$$

2)



3)



4)

