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Abstract

Acquired Immune Defciency Syndrome (AIDS) is a disease or continuum condition which is due to Human Immunodefciency Virus (HIV) infection. One in fve people are infected with HIV are not aware of the infection. Early detection of the infection helps the infected people to take medications to avoid future consequences and reduce the risk of transmitting the disease. Reverse transcriptase inhibitors (RTIs) were the frst available drug and were considered a principal kind of medication available to treat HIV patients. These drugs are still successful, effective, and are considered to have imperative solutions for treating HIV when joined with different medications. Investigating effect of this branch of the drugs on HIV and model this interaction has a great of importance to control AIDS.

This need can be addressed by the control system engineering which uses control theory to estimate and design a system. Since Stability is the most signifcant requirement of the system, and a system of instability cannot be expected for a particular transient reaction or steady state error specifcation then objective which is needed to be a6 ⁎ M e

***Corresponding authors:** Aydin Azizi, Department of Engineering, German University of Technology, Muscat, Oman, Tel: 968 22 061111; E-mail: aydin.azizi@gutech.edu.com

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[illegible] [27].

Feedback system

C[illegible] [28]. [illegible] [29]. [illegible] [30]. [illegible]

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[illegible] 27 :

[illegible]:

$$(\ )=(\ -\ )^{-1}\ (0)+(\ -\ )^{-1}\ (\ ) \quad (3)$$

[illegible]:

$$(\ )=\ (\ )+\ (\ ) \quad (4)$$

State space representation

[illegible]

F [illegible] 27 [illegible] 34 [illegible] 35,36 [illegible] 27 [illegible] 29 [illegible] A [illegible] 37,38 [illegible] 39 . E [illegible] 40 .

Routh-Hurwitz method

[illegible] 27 [illegible] 27 . A [illegible] 41 [illegible] 42 .

[illegible] 29 . C [illegible] 43 .

Root locus

[illegible] 27 [illegible] (C) [illegible] (C) [illegible] 44 [illegible]

[illegible] C [illegible] 45 .

[illegible] C [illegible] B [illegible]

Results and Discussion

[illegible] ( ) [illegible] ( ) [illegible] A [illegible]

B [illegible] ( ) [illegible] 27 :

$$\_\_ = \ - \ - \beta \quad (5)$$

$$\_\_ = \beta \ - \mu\ ^{*} \quad (6)$$

[illegible] ( ) [illegible] 27 :

[illegible]

$$\_\_ = \_\_ = \_\_ = 0 \quad (7)$$

[illegible] :

[illegible]

$$_2 = (1- \; _1)\beta \quad -\mu \quad ^* \qquad (10)$$

$$_2 = (1- \; _1)\beta \quad -\mu \quad ^* \qquad (11)$$

$$_3 = (1- \; _2) \quad ^* - \qquad (12)$$

$$\begin{bmatrix} \frac{\partial \; _1}{\partial} & \frac{\partial \; _1}{\partial \; ^*} & \frac{\partial \; _1}{\partial} \\ \frac{\partial \; _2}{} & \frac{\partial \; _2}{^*} & \frac{\partial \; _2}{} \\ \frac{\; _3}{} & \frac{\; _3}{^*} & \frac{\; _3}{} \end{bmatrix} \quad | \begin{bmatrix} \frac{\partial \; _1}{\partial \; _1} & \frac{\partial \; _1}{\partial \; _2} \\ \frac{\; _2}{\; _1} & \frac{\; _2}{\; _2} \\ \frac{\; _3}{\; _1} & \frac{\; _3}{\; _2} \end{bmatrix}$$

8. Carrington