GLOBAL EXISTENCE AND BOUNDEDNESS RESULTS FOR SOLUTIONS OF SPECIFIC THIRD ORDER NONLINEAR VECTOR DIFFERENTIAL EQUATIONS

Timur AYHAN[1], **Cemil TUNC**[2]

[1] *Siirt University, Siirt, Turkey*
[2] *Yuzuncu Yil University, Van, Turkey*

MSC 2000: 34C10

Abstract

We give criteria for the global existence and boundedness of all solutions of a kind of third order nonlinear ordinary vector differential equations of the form:

$$\left(q\left(t\right)\left(p\left(t\right)X^{'}\right)^{'}\right)^{'}+F\left(X,X^{'}\right)X^{''}+G\left(X^{'}\right)X^{'}+H\left(X\right)=R\left(t,X,X^{'},X^{''}\right)$$

By means of the Lyapunov second (direct) method, we obtain a new result on the subject and give an example for the illustration of the topic. Our result includes and generalizes some earlier results in the literature.

Keywords: Global existence,Lyapunov function,boundedness,third order.

References

[1] A. M. A., Abou-El-Ela, Boundedness of the solutions of certain third-order vector differential equations, *Annals of Differential Equations,* 1(2), (1985), 127-139.

[2] A. U., Afuwape, Further ultimate boundedness results for a third-order nonlinear system of differential equations, *Unione Matematica Italiana Bollettino C. Serie VI,* 4(1), (1985), 347-361.

[3] C., Tunc, On the boundedness and periodicity of the solutions of a certain vector differential equation of third-order, *Applied Mathematics and Mechanics* (English edn.), 20(2), (1999), 163-170.

[1]First Author's e-mail: tayhan002@gmail.com
[2]Second Author's e-mail: cemtunc@yahoo.com