South East Asian J. of Mathematics and Mathematical Sciences
Vol. 18, No. 1 (2022), pp. 27-34

ISSN (Online): 2582-0850

ISSN (Print): 0972-7752

ON NON-HOMOGENEOUS QUINARY QUINTIC EQUATION $(x^4 - y^4) = 125(z^2 - w^2)p^3$

Vijayasankar A., Sharadha Kumar and Gopalan M. A.*

Department of Mathematics,
National College (Autonomous),
Tiruchirappalli - 620001, Tamil Nadu, INDIA

E-mail : avsankar@yahoo.com, sharadhak12@gmail.com

*Department of Mathematics,
Shrimati Indira Gandhi College,
Tiruchirappalli - 620002, Tamil Nadu, INDIA

E-mail : mayilgopalan@gmail.com

(**Received:** *Mar. 13, 2021* **Accepted:** *Mar. 27, 2022* **Published:** *Apr. 30, 2022)*

Abstract: The quinary quintic non-homogeneous diophantine equation represented by $(x^4-y^4) = 125(z^2-w^2)p^3$ is analyzed for its patterns of non-zero distinct integral solutions and some properties among the solutions are also illustrated.

Keywords and Phrases: Non-homogeneous quintic equation, quintic equation with five unknowns, integral solutions.

2020 Mathematics Subject Classification: 11D41.

1. Introduction

The theory of Diophantine equations offers a rich variety of fascinating problems [1, 2, 8, 9]. Particularly,in [3, 4] quintic equations with three unknowns are studied for their integral solutions. In [5] quintic equations with four unknowns for their non-zero integer solutions. [6, 7] analyze quintic equations with five unknowns for their non-zero integer solutions. This communication concerns with yet another interesting non-homogeneous quintic equation with five unknowns given by $(x^4 - y^4) = 125(z^2 - w^2)p^3$ for finding its infinitely many non-zero distinct integer solutions and some properties among the solutions are also illustrated.