where 0, 1iff $K \xrightarrow[\alpha]{nfd} R_1 \in N$ and $K \xrightarrow[\alpha]{nfd} R_1$ is not a partial α-nfd.

*Example 4:*Let us assume a relation schema R_1= (A_1, B_1, C_1,D_1) and a set of nfds $N = \{A \xrightarrow[0.75]{nfd} B, A \xrightarrow[0.8]{nfd} C, A \xrightarrow[0.7]{nfd} D\}$ ofR_1. Find a neutrosophickey of R_1.

Solution:

Given $A \xrightarrow[0.75]{nfd} B$ .....(1), $A \xrightarrow[0.8]{nfd} C$ .... (2), $A \xrightarrow[0.7]{nfd} D$ .....(3)

Applying α-nfd union rule on (1) and (2), we get $A \xrightarrow[0.75]{nfd} BC$ -------- (4)

Again, applying α-nfd union rule on (3) and (4), we get $A \xrightarrow[0.7]{nfd} BCD$ -------- (5)

Also, $A \xrightarrow[1]{nfd} A$ is trivial ---- (6)

Thus from (5) and (6) using α -nfd union rule, we get $A \xrightarrow[0.7]{nfd} ABCD$ that is $A \xrightarrow[0.7]{nfd} R_1$ which implies that A is a neutrosophic key of R_1at 0.7-level of choice.

IV. CONCLUSION

In this paper, we have shown an extension of the classical relational database model with the concepts of neutrosophic set theory, a generalized version of vague sets. We mainly focused on the study of functional dependency in neutrosophic relational database. For this purpose, we have introduced a new kind of neutrosophic functional dependency (called α-nfd) based on the idea of α-equality of tuples and similarity measure of neutrosophic sets. We also expressed the neutrosophic inference rules and defined partial α-nfd and neutrosophic key.

The work may be extended to study Multivalued Dependency and Normalization using α-nfd which constitute an important part of a relational database design.

REFERENCES

[1] F. Smarandache, "First International Conference on Neutrosophy, Neutrosophic Probability, Set, and Logic", *University of New Mexico*, Vol. 1, No. 3, 2001.

[2] F. Zhao, Z. M. Ma and L. Yan, "A Vague Relational Model and Algebra", *Fourth International Conference on Fuzzy Systems and Knowledge Discovery (FSKD2007)*, Vol. 1, pp. 81-85, 2007.

[3] F. Zhao and Z. M. Ma, "Vague Query Based on Vague Relational Model", *Springer- Verlag Berlin Heidelberg, AISC 61*, pp. 229-238, 2009.

[4] Deli and S. Broumi, "Neutrosophic soft relations and some properties", *Annals of Fuzzy Mathematics and Informatics*, Vol. 9, No. 1, pp. 169–182, 2015.

[5] J. Mishra and S. Ghosh, "A New Functional Dependency in a Vague Relational Database Model", *International Journal of Computer Applications* , Vol. 39, No. 8, pp. 29-33, 2012.

[6] J. Mishra , S. Ghosh, "A Vague Multivalued Data Dependency", *International Journal of Fuzzy Information and Engineering, Springer*, Vol. 5, No. 4, pp. 459-473,2013.

[7] J. Mishra and S. Ghosh, "Uncertain Query Processing using Vague Sets or Fuzzy Set: Which one isBetter?",*International Journal of Computers, Communications and Control (IJCCC)*, Vol. 9, No. 6, pp. 730-740, 2014.

[8] M. Arora and R. Biswas, "Deployment of Neutrosophic technology to retrieve answers for queries posed in natural language", *in 3rd International Conference on Computer Science and Information Technology (ICCSIT 2010)*, Vol. 3, pp. 435-439, 2010.

[9] M. Arora, R. Biswas and U.S. Pandy, "Neutrosophic Relational Database Decomposition", *International Journal of Advanced Computer Science and Applications*, Vol. 2, No. 8, pp.121-125, 2011.

[10] S. Broumi, "Generalized Neutrosophic Soft Set", *International Journal of Computer Science, Engineering and Information Technology*, Vol. 3, No. 2, pp. 17–30, 2013.

[11] S. De and J. Mishra "Handle Inconsistent Data using New Method of Neutrosophic Logic for Proper Outcome", *International Journal of Science , technology and Management*,Vol. 6, No. 2, pp. 383-387, 2017.

[12] S. De and J. Mishra "Query Processing of Inconsistent Data using NeutrosophicSet", *IEEE International Conference on Computing Communication and Automation*, Vol. 10, No. 6, pp. 120-124, 2016.

[13] S. De and J. Mishra "Compare Different Similarity Measure Formula Based Imprecise Query on Neutrosophic Data", *International Conference on Advanced Computing and Intelligent Engineering*, Vol.5, No.12, pp. 330-334, 2016.

[14] S. De and J. Mishra "Inconsistent Data Processing Using Vague Set and Neutrosophic Set for Justifying Better Outcome", *IEEE International Conference on Inventive Communication and Computational Technologies*, Vol.7, No. 4, pp. 26-30, 2017.

[15] S. De and J. Mishra "Processing of Inconsistent Neutrosophic Data and Selecting Primary Key from the Relation" *International Conference on Inventive Computing and Informatics*, Vol.6, No. 7, pp. 245-250, 2017.

[16] W. L. Gau and D. J. Buehrer, "Vague Sets", *IEEE Trans. Syst. Man, Cybernetics*, Vol. 23, No. 2, pp.610- 614,1993.