

# International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2015

## A Study on Lucky Edge Labeling

A. Aishwarya

Department of Mathematics, Bharath University, Chennai, Tamil Nadu, India

**ABSTRACT:** In this paper the lucky edge labeling of Helm graph, Flower graph and Double Star graph are studied and the lucky numbers are found for these graphs.

**KEYWORDS:** Lucky edge labeling, lucky number, Helm graph, Flower graph and Double Star graph.

### I. INTRODUCTION

All the graph considered in this paper are simple and undirected graphs. For the basic definitions of graph theory refer to [1,3]. For study on labeling of graphs refer to [4]. For the definitions of Lucky edge labeling, lucky number and lucky edge labeled graph see[2].

The helm  $H_n$  is the graph obtained from a wheel  $W_n$  by attaching a pendant edge to each rim vertex. The flower  $F_n$  is the graph obtained from a helm  $H_n$  by joining each pendant vertex to the apex of the helm. Double star  $K_{1,n,n}$  is a tree obtained from the star  $K_{1,n}$  by adding a new pendant edge of the existing  $n$  pendant vertices. It has  $2n+1$  vertices and  $2n$  edges.[3,6,9]

### II. MAIN RESULTS

#### **Theorem 2.1: -**

The lucky number of Helm graph  $H_n$  is  $\eta(H_n) = 2n + 1$ .

#### **Proof:**

Let the apex vertex be  $v$  and let the other vertices joined to the apex vertex be  $v_1, v_2, \dots, v_n$ . Let the vertices joined to the vertices  $v_i$ 's be  $u_i$ 's.

Label the vertex  $v$  with label 1.[5] Let the vertices  $v_i$ 's be assigned the labels  $i+1$ . Label the vertex  $u_2$  and  $u_n$  with labels 3 and the other  $u_i$ 's be assigned the labels 2. This induces a lucky edge labeling of Helm graph  $H_n$  and the lucky number of  $H_n$  is given by  $\eta(H_n) = 2n + 1$ .

# International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2015

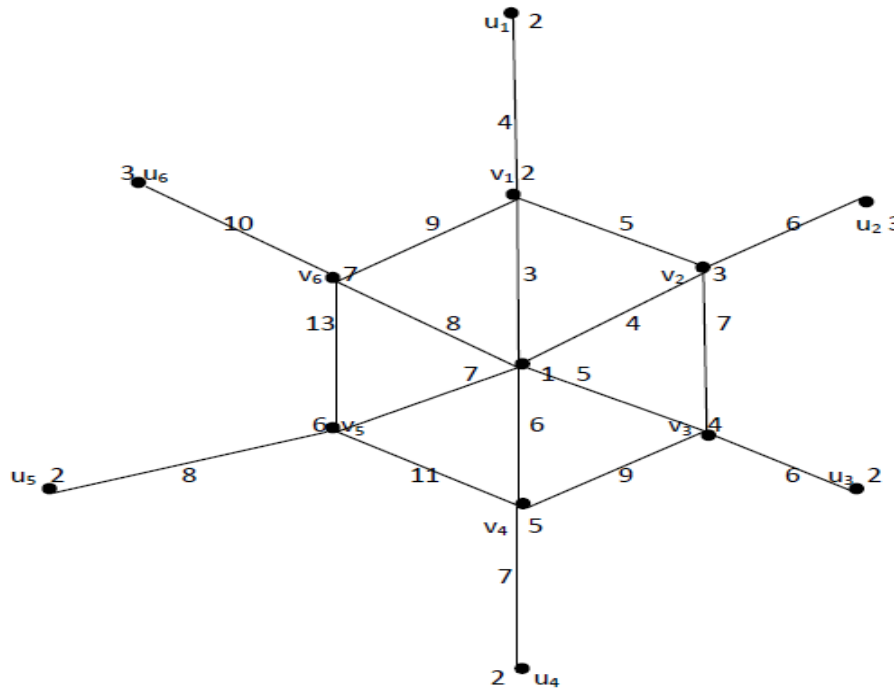


Fig. 1 :  $\eta(H_6) = 13$ .

**Theorem 2.2:** -

The lucky edge labeling of Flower graph  $Fl_n$  is given by  $\eta(Fl_n) = 3n + 2$ .

**Proof:**

Let the apex vertex be  $v$  and let the vertices attached to  $v$  be  $v_1, v_2, \dots, v_n$ . The pendent vertices attached to  $v_i$  be  $u_i$  ( $i = 1$  to  $n$ ) and these pendent vertices are joined to the apex vertex  $v$ .

Label the apex vertex  $v$  as 1 and the vertices  $v_i$  be assigned the labels  $i+1$  ( $i = 1$  to  $n$ ). Assign the labels to  $u_i$  as  $(n+1) + i$ ,  $i = 1$  to  $n$ [6].

This induces a lucky edge labeling of the Flower graph  $Fl_n$  and the lucky number of  $Fl_n$  is given by  $\eta(Fl_n) = 3n + 2$ .

## International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2015

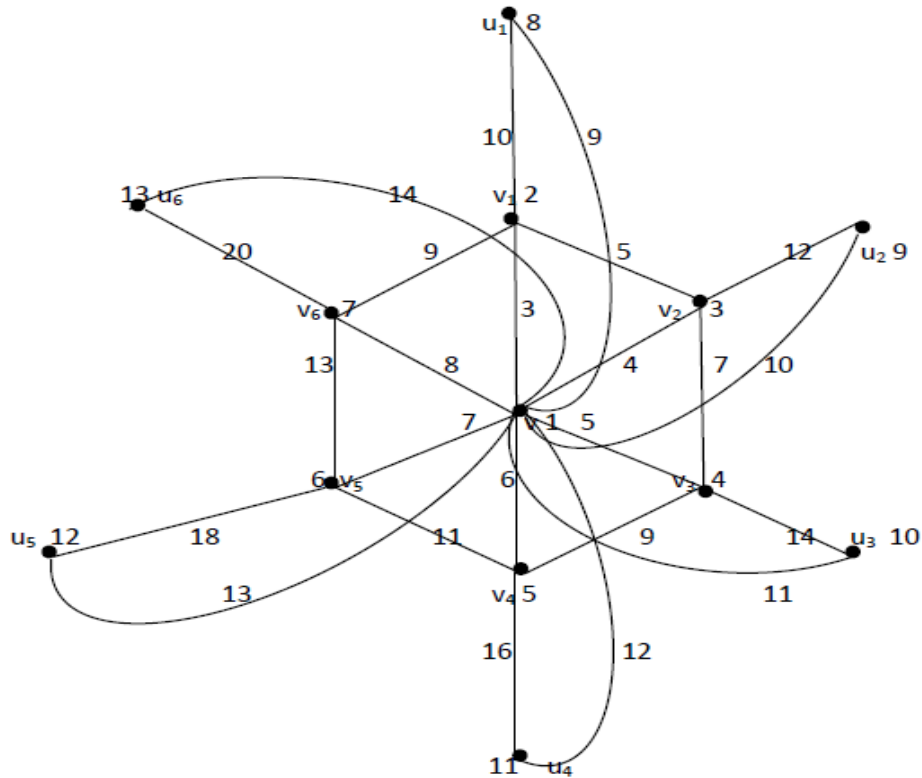


Fig. 2 :  $\eta(FI_6) = 20$ .

**Theorem 2.3:-**

The lucky number of double star graph  $K_{1,n,n}$  is  $\eta(K_{1,n,n}) = n + 2$ .

**Proof:**

Let the root vertex be  $v$ . Let the vertices adjacent to  $v$  be  $v_1, v_2, \dots, v_n$  and the  $n$  pendent vertices joined to  $v_i$  be  $u_i$  ( $i = 1$  to  $n$ )[7].

Labeling of  $K_{1,n,n}$  is as follows:-

Label the root vertex  $v$  with label 1 and  $v_i$  be assigned label  $i$  ( $i = 1$  to  $n$ ). Assign label 2 to all the pendent vertices  $u_i$  [8] ( $i = 1$  to  $n$ ). This induces a lucky edge labeling of  $K_{1,n,n}$  and the lucky number of  $K_{1,n,n}$  is  $\eta(K_{1,n,n}) = n + 2$ .

# International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 3, March 2015

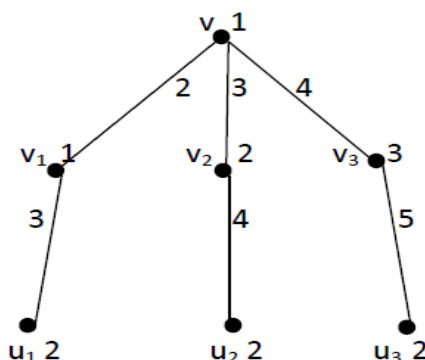


Fig. 3 :  $\eta(K_{1,3,3}) = 5$ .

### III. CONCLUSION

In this paper the lucky edge labeling of three types of graphs namely Helm graph, Flower graph and Double Star graph are discussed and this can be further studied for various other types of graphs as labeling grows rapidly in its importance of its various applications.

### REFERENCES

- [1]. Douglas B. West, Introduction to Graph Theory - Second edition, Published by Prentice Hall, 2001.
- [2]. Leena Sankari S., Masthan K.M.K., Aravindha Babu N., Bhattacharjee T., Elumalai M., "Apoptosis in cancer - an update", Asian Pacific Journal of Cancer Prevention, ISSN : 1513-7368, 13(10) (2012) PP. 4873-4878.
- [3]. Dr. A. Nellai Murugan, R. Maria Irudhaya Aspin Chitra, "Lucky Edge Labeling of  $P_n$ ,  $C_n$  and Corona of  $P_n$ ,  $C_n$ ", IJSIMR, Volume 2, Issue 8, August 2014, pp. 710-718.
- [4]. Subhashree A.R., Parameaswari P.J., Shanthi B., Revathy C., Parijatham B.O., "The reference intervals for the haematological parameters in healthy adult population of Chennai, Southern India", Journal of Clinical and Diagnostic Research, ISSN : 0973 - 709X, 6(10) (2012), PP. 1675-1680.
- [5]. Harary, Graph theory, Narosa Publishing House, New Delhi.
- [6]. Ramaswamy S., Sengottuvelu S., Haja Sherief S.H., Jaikumar S., Saravanan R., Prasadkumar C., Sivakumar T., "Gastroprotective activity of ethanolic extract of *Trachyspermum ammi* fruit", International Journal of Pharma and Bio Sciences, ISSN : 0975-6299, 1(1) (2010) Art-no.17.
- [7]. J.A. Gallian, "A dynamic survey of Graph Labeling", The electronic Journal of Combinatorics 16 (2009) #DS6.
- [8]. Kumar S.S., Karrunakaran C.M., Rao M.R.K., Balasubramanian M.P., "Inhibitory effects of *Indigofera aspalathoides* on 20-methylcholanthrene-induced chemical carcinogenesis in rats", Journal of Carcinogenesis, ISSN : 1477-3163, 10(1) (2011) Art.no.1.
- [9]. Kumaravel A., Meetei O.N., "An application of non-uniform cellular automata for efficient cryptography", 2013 IEEE Conference on Information and Communication Technologies, ICT 2013, ISSN : 1681-8016, (2013) pp.1200-1205.