

HAMILTONIAN AND PANCYCLIC GRAPHS IN THE CLASS OF SELF-CENTERED GRAPHS WITH RADIUS TWO

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Abstract

The paper deals with Hamiltonian and pancyclic graphs in the class of all self-centered graphs of radius 2. For both of the two considered classes of graphs we have done the following. For a given number n of vertices, we have found an upper bound of the minimum size of such graphs. For $n \leq 12$ we have found the exact values of the minimum size. On the other hand, the exact value of the maximum size has been found for every n . Moreover, we have shown that such a graph (of order n and) of size m exists for every m between the minimum and the maximum size. For $n \leq 10$ we have found all nonisomorphic graphs of the minimum size, and for $n = 11$ only for Hamiltonian graphs.

Keywords: self-centered graph with radius 2, Hamiltonian graph, pancyclic graph, size of graph.

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REFERENCES

- [1] J. Akiyama, K. Ando and D. Avis, *Miscellaneous properties of equi-eccentric graphs*, in: Convexity and Graph Theory, Proceedings of the Conference on Convexity and Graph Theory (Jerusalem, 1981), M. Rosenfeld and J. Zaks (Ed(s)), (North-Holland Math. Stud. 87, North-Holland, Amsterdam, 1984) 13–23.
doi:10.1016/S0304-0208(08)72802-0
- [2] F. Buckley, *Self-centered graphs with a given radius*, Congr. Numer. **23** (1979) 211–215.

- [3] F. Buckley and F. Harary, Distance in Graphs (Addison-Wesley Publishing Company, Redwood City, CA, 1990).

- [4] J.L. Gross, J. Yellen and P. Zhang, Handbook of Graph Theory (CRC Press, 2014).

- [5] A. Haviar, P. Hrnčiar and G. Monoszová, *Eccentric sequences and cycles in graphs*, Acta Univ. M. Belii Ser. Math. **11** (2004) 7–25.

- [6] P. Hrnčiar, *On cycles in graphs with specified radius and diameter*, Acta Univ. M. Belii Ser. Math. **20** (2012) 7–10.

- [7] P. Hrnčiar and G. Monoszová, *Minimal two-valued eccentric sequences*, Int. J. Pure Appl. Math. **84** (2013) 139–152.
- [8] D. Palumbíny, *Sul numero minimo degli spigoli di un singramma di raggio e diametro eguali a due*, Ist. Lombardo Accad. Sci. Lett. Rend. A **106** (1972) 704–712, in Italian.

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