**Full PDF DMGT Page** 

## EDGE-CONNECTIVITY AND EDGES OF EVEN FACTORS OF GRAPHS

## NASTARAN HAGHPARAST AND DARIUSH KIANI

Department of Mathematics and Computer Sciences Amirkabir University of Technology, Tehran, Iran

> e-mail: nhaghparast@aut.ac.ir dkiani@aut.ac.ir

## Abstract

An even factor of a graph is a spanning subgraph in which each vertex has a positive even degree. Jackson and Yoshimoto showed that if G is a 3-edge-connected graph with  $|G| \ge 5$  and v is a vertex with degree 3, then G has an even factor F containing two given edges incident with v in which each component has order at least 5. We prove that this theorem is satisfied for each pair of adjacent edges. Also, we show that each 3-edge-connected graph has an even factor F containing two given edges e and f such that every component containing neither e nor f has order at least 5. But we construct infinitely many 3-edge-connected graphs that do not have an even factor F containing two arbitrary prescribed edges in which each component has order at least 5.

**Keywords:** 3-edge-connected graph, 2-edge-connected graph, even factor, component.

2010 Mathematics Subject Classification: 05C70, 05C45.

## References

- J.A. Bondy and U.S.R. Murty, Graph Theory with Applications (North-Holland, NewYork-Amsterdam-Oxford, 1982).
- [2] N. Haghparast and D. Kiani, Even factor of bridgeless graphs containing two specified edges (2017), Czechoslovak Math. J., submitted.
- B. Jackson and K. Yoshimoto, Even subgraphs of bridgeless graphs and 2-factors of line graphs, Discrete Math. 307 (2007) 2775–2785.
   doi:10.1016/j.disc.2006.11.023

- B. Jackson and K. Yoshimoto, Spanning even subgraphs of 3-edge-connected graphs, J. Graph Theory 62 (2009) 37–47. doi:10.1002/jgt.20386
- [5] F. Jaeger, A note on sub-Eulerian graphs, J. Graph Theory 3 (1979) 91–93. doi:10.1002/jgt.3190030110
- M. Kano, C. Lee and K. Suzuki, Path and cycle factors of cubic bipartite graphs, Discuss. Math. Graph Theory 28 (2008) 551–556. doi:10.7151/dmgt.1426
- [7] H.-J. Lai, Eulerian subgraphs containing given edges, Discrete Math. 230 (2001) 63–69.
  doi:10.1016/S0012-365X(00)00070-4

Received 28 April 2017 Revised 28 August 2017 Accepted 28 August 2017