Electronic Journal of Linear Algebra ISSN 1081-3810
A publication of the International Linear Algebra Society
Volume 16, pp. 183-186, July 2007

ELA
http://math.technion.ac.il/iic/ela

MINIMUM RANK OF A TREE OVER AN ARBITRARY FIELD*

NATHAN L. CHENETTE[†], SEAN V. DROMS[‡], LESLIE HOGBEN[§], RANA MIKKELSON[¶], AND OLGA PRYPOROVA[¶]

Abstract. For a field F and graph G of order n, the minimum rank of G over F is defined to be the smallest possible rank over all symmetric matrices $A \in F^{n\times n}$ whose (i, j)th entry (for $i \neq j$) is nonzero whenever $\{i, j\}$ is an edge in G and is zero otherwise. It is shown that the minimum rank of a tree is independent of the field.

Key words. Minimum rank, Tree, Graph, Field, Path, Symmetric matrix.

AMS subject classifications. 05C50, 15A18.

*Received by the editors 3 August 2006. Accepted for publication 27 June 2007. Handling Editor: Bryan L. Shader.

[†]Department of Mathematics, Harvey Mudd College, Claremont, CA 91711, USA (nchenette@hmc.edu). Research supported by NSF grant DMS 0353880.

[‡]Department of Mathematics, University of Mary Washington, Fredericksburg, VA 22401, USA (seandroms@gmail.com). Research supported by NSF grant DMS 0353880.

[§]Department of Mathematics, Iowa State University, Ames, IA 50011, USA (lhogben@iastate.edu). Research partially supported by NSF grant DMS 0353880.

[¶]Department of Mathematics, Iowa State University, Ames, IA 50011, USA (ranam@iastate.edu, olgav@iastate.edu).