Ahmad, U.; **Husnine, S.**

Characterization of power digraphs modulo n. (English) Zbl 1249.11002

Commentat. Math. Univ. Carol. 52, No. 3, 359-367 (2011).

The authors assign to each pair of positive integers n and $k \geq 2$ a digraph $G(n,k)$ whose set of vertices is $Z_n = \{0, 1, \ldots n-1\}$ and for which there exists a directed edge from $a \in Z_n$ to $b \in Z_n$ if $a^k \equiv b \pmod{n}$. They establish necessary and sufficient conditions such that $G(n,k)$ has at least one isolated fixed point. Another necessary and sufficient condition on n and k, such that the digraph $G(n,k)$ contains exactly two components, is given. A new necessary and sufficient condition for the primality of the Fermat numbers is presented as well.

Reviewer: Michal Křížek (Praha)

MSC:

11A07 Congruences; primitive roots; residue systems
11A15 Power residues, reciprocity
05C20 Directed graphs (digraphs), tournaments
11A51 Factorization; primality

Keywords:

iteration digraph; isolated fixed point; Fermat number; regular digraph

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