National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Extremal problem for graphs with modular p-group symmetry
Speaker	: Kirti Sahu
Supervisor	: Prof. Ranjit Mehatari
Venue	: Seminar Room (Department of Mathematics)
Date and Time	: 23 Sep 2025 (11:00 am)
Abstract	: For a finite group G, define α(G) as the minimum number of vertices among all graphs Γ such that Aut Γ ~= G. For any p prime, all p-groups of order p n having cyclic subgroups of order p^n − 1 have been completely classified. Several authors have already investigated some of these families of groups in order to find vertex-minimal graphs. Here we consider a family of groups called modular p-groups, for an odd prime p and n ≥ 3. A modular p-group is defined as Modn(p) = a^(p^{n−1})= 1, b^p = 1, ba = a^((p^{n−2})+1) b. We compute the order of vertex-minimal graphs with Modn(p)-symmetry. The fixing number of a graph Γ is defined as the smallest number of vertices in V (Γ) that, when fixed, makes Aut Γ trivial. This concept has been extended to finite groups by Gibbons and Laison. For a finite group G, the fixing set is defined as the set of all fixing numbers of graphs having automorphism groups isomorphic to G. We show that any graph Γ whose automorphism group is a modular p-group has the fixing number 1. As a result, the modular p-group's fixing set becomes {1}. Keywords: Automorphism group, p-group, vertex-minimal graph, fixing number, fixing set