ON DETERMINATION OF THE MINIMUM GENUS OF COMPACT RIEMANN SURFACES ADMITTING A CLASS OF METACYCLIC AUTOMORPHISM GROUPS

Kuntala Patra and Dipankar Sarma[*]

Department of Mathematics
Gauhati University, Guwahati-781014, India

[*]Department of Mathematics
Jawaharlal Nehru College, Boko-781123, India

Abstract: Every finite group can be represented as a group of automorphisms of a compact Riemann surface of genus $g \geq 2$. It is of interest to determine the minimum genus of the Riemann surface on which a given finite group acts as a group of automorphisms.

1. Introduction

In this paper we find the minimum genus of the surface of which the group $G = D_m \times C_p$, where m is an odd integer greater than one and p is any odd prime, is a group of automorphisms. The minimum value of the genus g of a compact Riemann surface having G, as it's group of automorphisms is obtained as

(i) $g = 1 - m\dfrac{p+1}{2} + m\left(p - \dfrac{p}{pq_1}\right)$, if $(p, m) = 1$;

(ii) $g = 1 - m\dfrac{p+1}{2} + m\left(p - \dfrac{p}{q_1}\right)$, if $(p, m) \neq 1$;

(iii) $g = 4$, if $p = m = 3$;

where m has the prime decomposition

$$m = q_1^{r_1} q_2^{r_2} q_3^{r_3} \cdots q_l^{r_l}; \quad r_i > 0, \quad q_1 < q_2 < \cdots < q_l, \ q_i \geq 3.$$

Groups of automorphisms of compact Riemann surfaces constituted a glamorous topic of research during the last decade of the 20th century and for its