1003-14-904 **Tanush Tony Shaska*** (`tshaska@uidaho.edu`), 1678 Appaloosa, Moscow, ID 83843. *Genus 2 Curves that Admit a Degree 5 Map to an Elliptic Curve.*

We continue our study of genus 2 curves C that admit a cover $C \to E$ to a genus 1 curve E of prime degree n. These curves C form an irreducible 2-dimensional subvariety $\mathcal{L}_n$ of the moduli space $\mathcal{M}_2$ of genus 2 curves. Here we study the case $n = 5$. This extends earlier work for degree 2 and 3, aimed at illuminating the theory for general n.

We compute a normal form for the curves in the locus $\mathcal{L}_5$ and its three distinguished subloci. Further, we compute the equation of the elliptic subcover in all cases, give a birational parameterization of the subloci of $\mathcal{L}_5$ as subvarieties of $\mathcal{M}_2$ and classify all curves in these loci which have extra automorphisms. (Received September 30, 2004)