For an excellent grade you have to get minimum of 9 questions accepted of each set, for a 'good' - at least 7, and for 'passed' - 5 questions.

Group product. Conjugacy class. Solvability.

Problem 2.1: Show that if $G = N \rtimes H$ then $G/N \simeq H$.

Problem 2.2: Describe conjugacy classes of $O(2)$

Problem 2.3: Show that any subgroup of index 2 is normal.

Problem 2.4: Show that center $Z(G)$ of G is an abelian invariant subgroup of G.

Defenition 2.1. *Let p be a prime number. A p-group is a group whose order is some natural power of p.*

Problem 2.5: Show that center of p-group is non-trivial..

Problem 2.6: Show that all Sylow p-subgroups are conjugate to each other

Problem 2.7: Show that each element is represented in only one conjugacy class with identity element forming its own class.

Problem 2.8: Show that p^2-group is abelian.

Problem 2.9: Let $G = \langle a, b | ab = b^m a, ba = ab^n, m, n \in \mathbb{Z} \rangle$. Show that G is solvable.

Problem 2.10: Show that for $n \neq 6$ there's no outer automorphism of S_n. Construct the outer automorphism for $n = 6$.