A Study of Extra Special p-group

DISSERTATION

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ABSTRACT

In this dissertation we have discussed extra special p -group. A finite non- abelian p-group is called extra special p-group if its center is exactly equal to its commutator subgroup. Here we have discussed extra special p-groups and we have find that every non-abelian group of order p^3 is extra special p-group. In particular if $p = 2$ then we have two extra special p-groups one is dihedral group D_4 and another is Hamiltonian group Q_8.

Here we have also discussed that if G is non-abelian group of order p^3, then $Z(G)$ has order p. We have thoroughly discussed the following theorem:

Let G be a finite extra special group. Then it is central product of non-abelian groups of order p^3. In particular G is of order p^{2m+1} for some m.

To prove above theorem we have gone through solvability and nilpotency in groups, Frattini subgroups, and different type of bilinear forms.

Conclusion

- ✓ We have solved extra Special p-group of order p^3, where p is even prime discussed, we have find that one is Q_8 and second is D_4 .
- ✓ We have proved that every non-abelian group of order p^3 is extra special p-group.
- ✓ We have proved that G be a finite extra special group, then it is central product of non-abelian groups of order p^3. In particular G is of order p^{2m+1} for some m.