## Exercises(2-12):

- Let $P$ and $Q$ be two normal p-subgroups of a finite group $G$. Show that $PQ$ is a normal p-subgroup of $G$.
- Determine whether $(\mathrm{Z}_{125}, +_{125})$ is a p-group.
- Determine whether $(\mathrm{Z}_{121}, +_{121})$ is a p-group.
- Determine whether $(\mathrm{Z}_{41}, +_{41})$ is a p-group.
- Determine whether $(\mathrm{Z}_{16}, +_{16})$ is a p-group.
- Determine whether $(\mathrm{Z}_{625}, +_{625})$ is a p-group.
- Determine whether $(\mathrm{Z}_{185}, +_{185})$ is a p-group.
- Determine whether $(\mathrm{Z}_{128}, +_{128})$ is a p-group.
- Determine whether $(\mathrm{Z}_{256}, +_{256})$ is a p-group.
- Determine whether $(\mathrm{Z}_{100}, +_{100})$ is a p-group.
- Show that $\mathrm{G}_{\ell} = \{\pm 1, \pm i, \pm j, \pm k\}, \cdot)$ is a p-group.