

H. The S_n Groups

S_4	E	S_4	C_2	S_4^3			
A	1	1	1	1	R_z	$x^2 + y^2, z^2$	$xyz, z(x^2 - y^2)$
B	1	-1	1	-1	z	$x^2 - y^2, xy$	z^3
E	$\begin{Bmatrix} 1 & i & -1 & -i \\ 1 & -i & -1 & i \end{Bmatrix}$				$(x, y), (R_x, R_y)$	(xz, yz)	$(xz^2, yz^2), [x(x^2 - 3y^2), y(3x^2 - y^2)]$

S_6	E	C_3	C_3^2	i	S_6^5	S_6	$S_6 = C_3 \times C_2$	$\varepsilon = \exp(2\pi i/3)$
A_g	1	1	1	1	1	1	R_z	$x^2 + y^2, z^2$
E_g	$\begin{Bmatrix} 1 & \varepsilon & \varepsilon^* & 1 & \varepsilon & \varepsilon^* \\ 1 & \varepsilon^* & \varepsilon & 1 & \varepsilon^* & \varepsilon \end{Bmatrix}$						(R_x, R_y)	$(x^2 - y^2, xy),$ (xz, yz)
A_u	1	1	1	-1	-1	-1	z	$z^3, x(x^2 - 3y^2), y(3x^2 - y^2)$
E_u	$\begin{Bmatrix} 1 & \varepsilon & \varepsilon^* & -1 & -\varepsilon & -\varepsilon^* \\ 1 & \varepsilon^* & \varepsilon & -1 & -\varepsilon^* & -\varepsilon \end{Bmatrix}$						(x, y)	$(xz^2, yz^2), [xyz, z(x^2 - y^2)]$

S_8	E	C_8	C_4	S_8^3	C_2	S_8^5	C_4^3	S_8^7	$\varepsilon = \exp(2\pi i/8)$
A	1	1	1	1	1	1	1	1	R_z
B	1	-1	1	-1	1	-1	1	-1	z
E_1	$\begin{Bmatrix} 1 & \varepsilon & i & -\varepsilon^* & -1 & -\varepsilon & -i & \varepsilon^* \\ 1 & \varepsilon^* & -i & -\varepsilon & -1 & -\varepsilon^* & i & \varepsilon \end{Bmatrix}$								$(x, y),$ (R_x, R_y)
E_2	$\begin{Bmatrix} 1 & i & -1 & -i & 1 & i & -1 & -i \\ 1 & -i & -1 & i & 1 & -i & -1 & i \end{Bmatrix}$								$(x^2 - y^2, xy)$
E_3	$\begin{Bmatrix} 1 & -\varepsilon^* & -i & \varepsilon & -1 & \varepsilon^* & i & -\varepsilon \\ 1 & -\varepsilon & i & \varepsilon^* & -1 & \varepsilon & -i & -\varepsilon^* \end{Bmatrix}$								(xz, yz)