

F. The D_{nd} Groups

D_{2d}	E	$2S_4$	C_2	$2C_2'$	$2\sigma_d$	(x axis coincident with C_2')				
A_1	1	1	1	1	1	R_z	$x^2 + y^2, z^2$	xyz		
A_2	1	1	1	-1	-1					
B_1	1	-1	1	1	-1				$x^2 - y^2$	$z(x^2 - y^2)$
B_2	1	-1	1	-1	1				xy	z^3
E	2	0	-2	0	0				$(x, y), (R_x, R_y)$	(xz, yz)

D_{3d}	E	$2C_3$	$3C_2$	i	$2S_6$	$3\sigma_d$	(x axis coincident with C_2)				
A_{1g}	1	1	1	1	1	1	R_z	$x^2 + y^2, z^2$			
A_{2g}	1	1	-1	1	1	-1					
E_g	2	-1	0	2	-1	0				(R_x, R_y)	$(x^2 - y^2, xy); (xz, yz)$
A_{1u}	1	1	1	-1	-1	-1				z	$x(x^2 - 3y^2)$
A_{2u}	1	1	-1	-1	-1	1					
E_u	2	-1	0	-2	1	0	(x, y)	$(xz^2, yz^2), [xyz, z(x^2 - y^2)]$			

D_{4d}	E	$2S_8$	$2C_4$	$2S_8^3$	C_2	$4C_2'$	$4\sigma_d$	(x axis coincident with C_2')			
A_1	1	1	1	1	1	1	1	R_z	$x^2 + y^2, z^2$		
A_2	1	1	1	1	1	-1	-1				
B_1	1	-1	1	-1	1	1	-1				
B_2	1	-1	1	-1	1	-1	1				z
E_1	2	$\sqrt{2}$	0	$-\sqrt{2}$	-2	0	0				(x, y)
E_2	2	0	-2	0	2	0	0	(R_x, R_y)	(xz^2, yz^2)	$[xyz, z(x^2 - y^2)]$	
E_3	2	$-\sqrt{2}$	0	$\sqrt{2}$	-2	0	0	(R_x, R_y)	(xz, yz)	$[x(x^2 - 3y^2), y(3x^2 - y^2)]$	

D_{5d}	E	$2C_5$	$2C_5^2$	$5C_2$	i	$2S_{10}^3$	$2S_{10}$	$5\sigma_d$	(x axis coincident with C_2)				
A_{1g}	1	1	1	1	1	1	1	1	R_z	$x^2 + y^2, z^2$			
A_{2g}	1	1	1	-1	1	1	1	-1					
E_{1g}	2	$2 \cos 72^\circ$	$2 \cos 144^\circ$	0	2	$2 \cos 72^\circ$	$2 \cos 144^\circ$	0				(R_x, R_y)	(xz, yz)
E_{2g}	2	$2 \cos 144^\circ$	$2 \cos 72^\circ$	0	2	$2 \cos 144^\circ$	$2 \cos 72^\circ$	0				(x, y)	$(x^2 - y^2, xy)$
A_{1u}	1	1	1	1	-1	-1	-1	-1				z	z^3
A_{2u}	1	1	1	-1	-1	-1	-1	1	(x, y)	(xz^2, yz^2)			
E_{1u}	2	$2 \cos 72^\circ$	$2 \cos 144^\circ$	0	-2	$-2 \cos 72^\circ$	$-2 \cos 144^\circ$	0	(x, y)	$[xyz, z(x^2 - y^2)]$			
E_{2u}	2	$2 \cos 144^\circ$	$2 \cos 72^\circ$	0	-2	$-2 \cos 144^\circ$	$-2 \cos 72^\circ$	0	(x, y)	$[x(x^2 - 3y^2), y(3x^2 - y^2)]$			

D_{6d}	E	$2S_{12}$	$2C_6$	$2S_4$	$2C_3$	$2S_{12}^5$	C_2	$6C_2'$	$6\sigma_d$	(x axis coincident with C_2')			
A_1	1	1	1	1	1	1	1	1	1	R_z	$x^2 + y^2, z^2$		
A_2	1	1	1	1	1	1	1	-1	-1				
B_1	1	-1	1	-1	1	-1	1	1	-1				
B_2	1	-1	1	-1	1	-1	1	-1	1				z
E_1	2	$\sqrt{3}$	1	0	-1	$-\sqrt{3}$	-2	0	0				(x, y)
E_2	2	1	-1	-2	-1	1	2	0	0	(R_x, R_y)	(xz^2, yz^2)	$[x(x^2 - 3y^2), y(3x^2 - y^2)]$	
E_3	2	0	-2	0	2	0	-2	0	0	(R_x, R_y)	(xz, yz)	$[xyz, z(x^2 - y^2)]$	
E_4	2	-1	-1	2	-1	-1	2	0	0	(R_x, R_y)	(xz, yz)	$[xyz, z(x^2 - y^2)]$	
E_5	2	$-\sqrt{3}$	1	0	-1	$\sqrt{3}$	-2	0	0	(R_x, R_y)	(xz, yz)	$[xyz, z(x^2 - y^2)]$	