

# Model for “CeCoSi”

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## General Condition

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- Basis type: 1gs
- SAMB selection:
  - Type: [Q, G]
  - Rank: [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11]
  - Irrep.: [ $A_{1g}$ ,  $A_{2g}$ ,  $B_{1g}$ ,  $B_{2g}$ ,  $E_g$ ,  $A_{1u}$ ,  $A_{2u}$ ,  $B_{1u}$ ,  $B_{2u}$ ,  $E_u$ ]
  - Spin (s): [0, 1]
- Max. neighbor: 10
- Search cell range: (-2, 3), (-2, 3), (-2, 3)
- Toroidal priority: false

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## Group and Unit Cell

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- Group: SG No. 129  $D_{4h}^7$   $P4/nmm$  [ tetragonal ]
- Associated point group: PG No. 129  $D_{4h}$  4/mmm [ tetragonal ]
- Unit cell:  
 $a = 4.05700, b = 4.05700, c = 6.98700, \alpha = 90.0, \beta = 90.0, \gamma = 90.0$
- Lattice vectors (conventional cell):  
 $\mathbf{a}_1 = [4.05700, 0.00000, 0.00000]$   
 $\mathbf{a}_2 = [0.00000, 4.05700, 0.00000]$   
 $\mathbf{a}_3 = [0.00000, 0.00000, 6.98700]$

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## Symmetry Operation

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Table 1: Symmetry operation

| # | SO    | # | SO                                 | # | SO   | # | SO   | # | SO                       |
|---|-------|---|------------------------------------|---|--|---|--|---|--------------------------|
| 1 | {1 0} | 2 | {2001  $\frac{1}{2}\frac{1}{2}0$ } | 3 | {4 <sup>+</sup> <sub>001</sub>   $\frac{1}{2}00$ } | 4 | {4 <sup>-</sup> <sub>001</sub>  0 $\frac{1}{2}0$ } | 5 | {2010 0 $\frac{1}{2}0$ } |

*continued ...*

Table 1

| #  | SO                             | #  | SO                                    | #  | SO                          | #  | SO                          | #  | SO                                    |
|----|--------------------------------|----|---------------------------------------|----|-----------------------------|----|-----------------------------|----|---------------------------------------|
| 6  | $\{2_{100} \frac{1}{2}00\}$    | 7  | $\{2_{110} \frac{1}{2}\frac{1}{2}0\}$ | 8  | $\{2_{1-10} 0\}$            | 9  | $\{-1 0\}$                  | 10 | $\{m_{001} \frac{1}{2}\frac{1}{2}0\}$ |
| 11 | $\{-4_{001}^+ \frac{1}{2}00\}$ | 12 | $\{-4_{001}^- 0\frac{1}{2}0\}$        | 13 | $\{m_{010} 0\frac{1}{2}0\}$ | 14 | $\{m_{100} \frac{1}{2}00\}$ | 15 | $\{m_{110} \frac{1}{2}\frac{1}{2}0\}$ |
| 16 | $\{m_{1-10} 0\}$               |    |                                       |    |                             |    |                             |    |                                       |

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— Harmonics —

Table 2: Harmonics

| # | symbol                    | irrep.   | rank | X      | multiplicity | component | symmetry   |
|---|---------------------------|----------|------|--------|--------------|-----------|--|
| 1 | $\mathbb{Q}_0(A_{1g})$    | $A_{1g}$ | 0    | $Q, T$ | -            | -         | 1  |
| 2 | $\mathbb{Q}_2(A_{1g})$    | $A_{1g}$ | 2    | $Q, T$ | -            | -         | $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$                                   |
| 3 | $\mathbb{Q}_4(A_{1g}, 1)$ | $A_{1g}$ | 4    | $Q, T$ | 1            | -         | $\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$     |
| 4 | $\mathbb{Q}_4(A_{1g}, 2)$ | $A_{1g}$ | 4    | $Q, T$ | 2            | -         | $-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ |
| 5 | $\mathbb{G}_0(A_{1u})$    | $A_{1u}$ | 0    | $G, M$ | -            | -         | 1  |
| 6 | $\mathbb{G}_2(A_{1u})$    | $A_{1u}$ | 2    | $G, M$ | -            | -         | $-\frac{x^2}{2} - \frac{y^2}{2} + z^2$                                   |
| 7 | $\mathbb{G}_4(A_{1u}, 1)$ | $A_{1u}$ | 4    | $G, M$ | 1            | -         | $\frac{\sqrt{21}(x^4 - 3x^2y^2 - 3x^2z^2 + y^4 - 3y^2z^2 + z^4)}{6}$     |
| 8 | $\mathbb{G}_4(A_{1u}, 2)$ | $A_{1u}$ | 4    | $G, M$ | 2            | -         | $-\frac{\sqrt{15}(x^4 - 12x^2y^2 + 6x^2z^2 + y^4 + 6y^2z^2 - 2z^4)}{12}$ |
| 9 | $\mathbb{Q}_5(A_{1u})$    | $A_{1u}$ | 5    | $Q, T$ | -            | -         | $\frac{3\sqrt{35}xyz(x-y)(x+y)}{2}$                                      |

continued ...

Table 2

| #  | symbol                  | irrep.   | rank | X      | multiplicity | component | symmetry   |
|----|-------------------------|----------|------|--------|--------------|-----------|--|
| 10 | $\mathbb{G}_1(A_{2g})$  | $A_{2g}$ | 1    | $G, M$ | -            | -         | $z$  |
| 11 | $\mathbb{G}_3(A_{2g})$  | $A_{2g}$ | 3    | $G, M$ | -            | -         | $-\frac{z(3x^2+3y^2-2z^2)}{2}$                   |
| 12 | $\mathbb{Q}_4(A_{2g})$  | $A_{2g}$ | 4    | $Q, T$ | -            | -         | $\frac{\sqrt{35}xy(x-y)(x+y)}{2}$                |
| 13 | $\mathbb{Q}_1(A_{2u})$  | $A_{2u}$ | 1    | $Q, T$ | -            | -         | $z$  |
| 14 | $\mathbb{Q}_3(A_{2u})$  | $A_{2u}$ | 3    | $Q, T$ | -            | -         | $-\frac{z(3x^2+3y^2-2z^2)}{2}$                   |
| 15 | $\mathbb{G}_4(A_{2u})$  | $A_{2u}$ | 4    | $G, M$ | -            | -         | $\frac{\sqrt{35}xy(x-y)(x+y)}{2}$                |
| 16 | $\mathbb{Q}_2(B_{1g})$  | $B_{1g}$ | 2    | $Q, T$ | -            | -         | $\frac{\sqrt{3}(x-y)(x+y)}{2}$                   |
| 17 | $\mathbb{G}_3(B_{1g})$  | $B_{1g}$ | 3    | $G, M$ | -            | -         | $\sqrt{15}xyz$                                   |
| 18 | $\mathbb{Q}_4(B_{1g})$  | $B_{1g}$ | 4    | $Q, T$ | -            | -         | $\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$     |
| 19 | $\mathbb{G}_2(B_{1u})$  | $B_{1u}$ | 2    | $G, M$ | -            | -         | $\frac{\sqrt{3}(x-y)(x+y)}{2}$                   |
| 20 | $\mathbb{Q}_3(B_{1u})$  | $B_{1u}$ | 3    | $Q, T$ | -            | -         | $\sqrt{15}xyz$                                   |
| 21 | $\mathbb{G}_4(B_{1u})$  | $B_{1u}$ | 4    | $G, M$ | -            | -         | $\frac{\sqrt{5}(x-y)(x+y)(x^2+y^2-6z^2)}{4}$     |
| 22 | $\mathbb{Q}_5(B_{1u})$  | $B_{1u}$ | 5    | $Q, T$ | -            | -         | $\frac{\sqrt{105}xyz(x^2+y^2-2z^2)}{2}$          |
| 23 | $\mathbb{Q}_2(B_{2g})$  | $B_{2g}$ | 2    | $Q, T$ | -            | -         | $\sqrt{3}xy$                                     |
| 24 | $\mathbb{G}_3(B_{2g})$  | $B_{2g}$ | 3    | $G, M$ | -            | -         | $\frac{\sqrt{15}z(x-y)(x+y)}{2}$                 |
| 25 | $\mathbb{Q}_4(B_{2g})$  | $B_{2g}$ | 4    | $Q, T$ | -            | -         | $-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$            |
| 26 | $\mathbb{G}_2(B_{2u})$  | $B_{2u}$ | 2    | $G, M$ | -            | -         | $\sqrt{3}xy$                                     |
| 27 | $\mathbb{Q}_3(B_{2u})$  | $B_{2u}$ | 3    | $Q, T$ | -            | -         | $\frac{\sqrt{15}z(x-y)(x+y)}{2}$                 |
| 28 | $\mathbb{G}_4(B_{2u})$  | $B_{2u}$ | 4    | $G, M$ | -            | -         | $-\frac{\sqrt{5}xy(x^2+y^2-6z^2)}{2}$            |
| 29 | $\mathbb{Q}_5(B_{2u})$  | $B_{2u}$ | 5    | $Q, T$ | -            | -         | $-\frac{\sqrt{105}z(x-y)(x+y)(x^2+y^2-2z^2)}{4}$ |
| 30 | $\mathbb{G}_{1,1}(E_g)$ | $E_g$    | 1    | $G, M$ | -            | 1         | $x$  |

continued ...

Table 2

| #  | symbol                     | irrep. | rank | X      | multiplicity | component | symmetry                              |
|----|----------------------------|--------|------|--------|--------------|-----------|---------------------------------------|
| 31 | $\mathbb{G}_{1,2}(E_g)$    |        |      |        |              | 2         | $-y$                                  |
| 32 | $\mathbb{Q}_{2,1}(E_g)$    | $E_g$  | 2    | $Q, T$ | -            | 1         | $\sqrt{3}yz$                          |
| 33 | $\mathbb{Q}_{2,2}(E_g)$    |        |      |        |              | 2         | $\sqrt{3}xz$                          |
| 34 | $\mathbb{G}_{3,1}(E_g, 1)$ | $E_g$  | 3    | $G, M$ | 1            | 1         | $\frac{x(2x^2-3y^2-3z^2)}{2}$         |
| 35 | $\mathbb{G}_{3,2}(E_g, 1)$ |        |      |        |              | 2         | $\frac{y(3x^2-2y^2+3z^2)}{2}$         |
| 36 | $\mathbb{G}_{3,1}(E_g, 2)$ | $E_g$  | 3    | $G, M$ | 2            | 1         | $\frac{\sqrt{15}x(y-z)(y+z)}{2}$      |
| 37 | $\mathbb{G}_{3,2}(E_g, 2)$ |        |      |        |              | 2         | $-\frac{\sqrt{15}y(x-z)(x+z)}{2}$     |
| 38 | $\mathbb{Q}_{4,1}(E_g, 1)$ | $E_g$  | 4    | $Q, T$ | 1            | 1         | $\frac{\sqrt{35}yz(y-z)(y+z)}{2}$     |
| 39 | $\mathbb{Q}_{4,2}(E_g, 1)$ |        |      |        |              | 2         | $\frac{\sqrt{35}xz(x-z)(x+z)}{2}$     |
| 40 | $\mathbb{Q}_{4,1}(E_g, 2)$ | $E_g$  | 4    | $Q, T$ | 2            | 1         | $\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$  |
| 41 | $\mathbb{Q}_{4,2}(E_g, 2)$ |        |      |        |              | 2         | $-\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$ |
| 42 | $\mathbb{Q}_{1,1}(E_u)$    | $E_u$  | 1    | $Q, T$ | -            | 1         | $x$                                   |
| 43 | $\mathbb{Q}_{1,2}(E_u)$    |        |      |        |              | 2         | $y$                                   |
| 44 | $\mathbb{G}_{2,1}(E_u)$    | $E_u$  | 2    | $G, M$ | -            | 1         | $\sqrt{3}yz$                          |
| 45 | $\mathbb{G}_{2,2}(E_u)$    |        |      |        |              | 2         | $-\sqrt{3}xz$                         |
| 46 | $\mathbb{Q}_{3,1}(E_u, 1)$ | $E_u$  | 3    | $Q, T$ | 1            | 1         | $\frac{x(2x^2-3y^2-3z^2)}{2}$         |
| 47 | $\mathbb{Q}_{3,2}(E_u, 1)$ |        |      |        |              | 2         | $-\frac{y(3x^2-2y^2+3z^2)}{2}$        |
| 48 | $\mathbb{Q}_{3,1}(E_u, 2)$ | $E_u$  | 3    | $Q, T$ | 2            | 1         | $\frac{\sqrt{15}x(y-z)(y+z)}{2}$      |
| 49 | $\mathbb{Q}_{3,2}(E_u, 2)$ |        |      |        |              | 2         | $\frac{\sqrt{15}y(x-z)(x+z)}{2}$      |
| 50 | $\mathbb{G}_{4,1}(E_u, 1)$ | $E_u$  | 4    | $G, M$ | 1            | 1         | $\frac{\sqrt{35}yz(y-z)(y+z)}{2}$     |
| 51 | $\mathbb{G}_{4,2}(E_u, 1)$ |        |      |        |              | 2         | $-\frac{\sqrt{35}xz(x-z)(x+z)}{2}$    |

continued ...

Table 2

| #  | symbol                     | irrep. | rank | X      | multiplicity | component | symmetry                             |
|----|----------------------------|--------|------|--------|--------------|-----------|--------------------------------------|
| 52 | $\mathbb{G}_{4,1}(E_u, 2)$ | $E_u$  | 4    | $G, M$ | 2            | 1         | $\frac{\sqrt{5}yz(6x^2-y^2-z^2)}{2}$ |
| 53 | $\mathbb{G}_{4,2}(E_u, 2)$ |        |      |        |              | 2         | $\frac{\sqrt{5}xz(x^2-6y^2+z^2)}{2}$ |

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Basis in full matrix

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Table 3: dimension = 36

| #  | orbital@atom(SL)                 |
|----|----------------------------------|----|----------------------------------|----|----------------------------------|----|----------------------------------|----|----------------------------------|
| 1  | $ p_x, \uparrow\rangle @Ce(1)$   | 2  | $ p_x, \downarrow\rangle @Ce(1)$ | 3  | $ p_y, \uparrow\rangle @Ce(1)$   | 4  | $ p_y, \downarrow\rangle @Ce(1)$ | 5  | $ p_z, \uparrow\rangle @Ce(1)$   |
| 6  | $ p_z, \downarrow\rangle @Ce(1)$ | 7  | $ p_x, \uparrow\rangle @Ce(2)$   | 8  | $ p_x, \downarrow\rangle @Ce(2)$ | 9  | $ p_y, \uparrow\rangle @Ce(2)$   | 10 | $ p_y, \downarrow\rangle @Ce(2)$ |
| 11 | $ p_z, \uparrow\rangle @Ce(2)$   | 12 | $ p_z, \downarrow\rangle @Ce(2)$ | 13 | $ p_x, \uparrow\rangle @Co(1)$   | 14 | $ p_x, \downarrow\rangle @Co(1)$ | 15 | $ p_y, \uparrow\rangle @Co(1)$   |
| 16 | $ p_y, \downarrow\rangle @Co(1)$ | 17 | $ p_z, \uparrow\rangle @Co(1)$   | 18 | $ p_z, \downarrow\rangle @Co(1)$ | 19 | $ p_x, \uparrow\rangle @Co(2)$   | 20 | $ p_x, \downarrow\rangle @Co(2)$ |
| 21 | $ p_y, \uparrow\rangle @Co(2)$   | 22 | $ p_y, \downarrow\rangle @Co(2)$ | 23 | $ p_z, \uparrow\rangle @Co(2)$   | 24 | $ p_z, \downarrow\rangle @Co(2)$ | 25 | $ p_x, \uparrow\rangle @Si(1)$   |
| 26 | $ p_x, \downarrow\rangle @Si(1)$ | 27 | $ p_y, \uparrow\rangle @Si(1)$   | 28 | $ p_y, \downarrow\rangle @Si(1)$ | 29 | $ p_z, \uparrow\rangle @Si(1)$   | 30 | $ p_z, \downarrow\rangle @Si(1)$ |
| 31 | $ p_x, \uparrow\rangle @Si(2)$   | 32 | $ p_x, \downarrow\rangle @Si(2)$ | 33 | $ p_y, \uparrow\rangle @Si(2)$   | 34 | $ p_y, \downarrow\rangle @Si(2)$ | 35 | $ p_z, \uparrow\rangle @Si(2)$   |
| 36 | $ p_z, \downarrow\rangle @Si(2)$ |    |                                  |    |                                  |    |                                  |    |                                  |

Table 4: Atomic basis (orbital part only)

| orbital       | definition |
|---------------|------------|
| $ p_x\rangle$ | $x$        |
| $ p_y\rangle$ | $y$        |
| $ p_z\rangle$ | $z$        |

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## SAMB

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720 (all 954) SAMBs

- 'Ce' site-cluster
- \* bra:  $\langle p_x, \uparrow |, \langle p_x, \downarrow |, \langle p_y, \uparrow |, \langle p_y, \downarrow |, \langle p_z, \uparrow |, \langle p_z, \downarrow |$
- \* ket:  $|p_x, \uparrow \rangle, |p_x, \downarrow \rangle, |p_y, \uparrow \rangle, |p_y, \downarrow \rangle, |p_z, \uparrow \rangle, |p_z, \downarrow \rangle$
- \* wyckoff: 2c

[z1]  $\mathbb{Q}_0^{(c)}(A_{1g}) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$

[z2]  $\mathbb{Q}_2^{(c)}(A_{1g}) = \mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$

[z3]  $\mathbb{Q}_2^{(1,-1;c)}(A_{1g}) = \mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$

[z4]  $\mathbb{Q}_0^{(1,1;c)}(A_{1g}) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$

[z67]  $\mathbb{Q}_1^{(c)}(A_{2u}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$

[z124]  $\mathbb{Q}_1^{(c)}(A_{2u}, b) = \mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$

[z125]  $\mathbb{Q}_1^{(1,-1;c)}(A_{2u}) = \mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$

[z184]  $\mathbb{Q}_1^{(1,1;c)}(A_{2u}) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$

$$\boxed{\text{z185}} \quad \mathbb{Q}_2^{(c)}(B_{1g}) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z244}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z245}} \quad \mathbb{Q}_3^{(c)}(B_{1u}) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z246}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z247}} \quad \mathbb{Q}_2^{(c)}(B_{2g}) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z248}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z249}} \quad \mathbb{Q}_3^{(c)}(B_{2u}) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z478}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{2u}) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z536}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z537}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z538}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z539}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z600}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z601}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z659}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z660}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z721}} \quad \mathbb{Q}_{1,1}^{(1,0;c)}(E_u) = -\frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z722}} \quad \mathbb{Q}_{1,2}^{(1,0;c)}(E_u) = -\frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z723}} \quad \mathbb{G}_0^{(1,0;c)}(A_{1u}) = \mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z724}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}) = \mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z725}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z726}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g) = \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

• 'Co' site-cluster

\* bra:  $\langle p_x, \uparrow |, \langle p_x, \downarrow |, \langle p_y, \uparrow |, \langle p_y, \downarrow |, \langle p_z, \uparrow |, \langle p_z, \downarrow |$

\* ket:  $|p_x, \uparrow \rangle, |p_x, \downarrow \rangle, |p_y, \uparrow \rangle, |p_y, \downarrow \rangle, |p_z, \uparrow \rangle, |p_z, \downarrow \rangle$

\* wyckoff: 2a

$$\boxed{\text{z5}} \quad \mathbb{Q}_0^{(c)}(A_{1g}) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z6}} \quad \mathbb{Q}_2^{(c)}(A_{1g}) = \mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z7}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}) = \mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z8}} \quad \mathbb{Q}_0^{(1,1;c)}(A_{1g}) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z68}} \quad \mathbb{Q}_5^{(c)}(A_{1u}) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_3^{(s)}(B_{2u})$$

$$\boxed{\text{z126}} \quad \mathbb{Q}_5^{(1,-1;c)}(A_{1u}) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_3^{(s)}(B_{2u})$$

$$\boxed{\text{z127}} \quad \mathbb{Q}_1^{(c)}(A_{2u}) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_3^{(s)}(B_{2u})$$

$$\boxed{\text{z186}} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_3^{(s)}(B_{2u})$$

$$\boxed{\text{z187}} \quad \mathbb{Q}_2^{(c)}(B_{1g}) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z250}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z251}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{1u}) = \mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_3^{(s)}(B_{2u})$$

$$\boxed{\text{z252}} \quad \mathbb{Q}_2^{(c)}(B_{2g}) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z253}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z254}} \quad \mathbb{Q}_3^{(c)}(B_{2u}) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_3^{(s)}(B_{2u})$$

$$\boxed{\text{z255}} \quad \mathbb{Q}_5^{(c)}(B_{2u}) = \mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_3^{(s)}(B_{2u})$$

$$\boxed{\text{z479}} \quad \mathbb{Q}_5^{(1,-1;c)}(B_{2u}) = \mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_3^{(s)}(B_{2u})$$

$$\boxed{\text{z480}} \quad \mathbb{Q}_3^{(1,1;c)}(B_{2u}) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_3^{(s)}(B_{2u})$$

$$\boxed{\text{z540}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z541}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z602}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z661}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z662}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_3^{(s)}(B_{2u})}{2}$$

$$\boxed{\text{z663}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_3^{(s)}(B_{2u})}{2}$$

$$\boxed{\text{z664}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_3^{(s)}(B_{2u})}{2}$$

$$\boxed{\text{z727}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_3^{(s)}(B_{2u})}{2}$$

$$\boxed{\text{z728}} \quad \mathbb{Q}_{3,1}^{(1,0;c)}(E_u, 1) = -\frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_3^{(s)}(B_{2u})}{2}$$

$$\boxed{\text{z729}} \quad \mathbb{Q}_{3,2}^{(1,0;c)}(E_u, 1) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_3^{(s)}(B_{2u})}{2}$$

$$\boxed{\text{z730}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}) = \mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z731}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z732}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g) = \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

• 'Si' site-cluster

- \* bra:  $\langle p_x, \uparrow |, \langle p_x, \downarrow |, \langle p_y, \uparrow |, \langle p_y, \downarrow |, \langle p_z, \uparrow |, \langle p_z, \downarrow |$
- \* ket:  $|p_x, \uparrow \rangle, |p_x, \downarrow \rangle, |p_y, \uparrow \rangle, |p_y, \downarrow \rangle, |p_z, \uparrow \rangle, |p_z, \downarrow \rangle$
- \* wyckoff: 2c

$$\boxed{\text{z9}} \quad \mathbb{Q}_0^{(c)}(A_{1g}) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z10}} \quad \mathbb{Q}_2^{(c)}(A_{1g}) = \mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z11}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}) = \mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z12}} \quad \mathbb{Q}_0^{(1,1;c)}(A_{1g}) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z69}} \quad \mathbb{Q}_1^{(c)}(A_{2u}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z128}} \quad \mathbb{Q}_1^{(c)}(A_{2u}, b) = \mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z129}} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}) = \mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z188}} \quad \mathbb{Q}_1^{(1,1;c)}(A_{2u}) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z189}} \quad \mathbb{Q}_2^{(c)}(B_{1g}) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z256}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z257}} \quad \mathbb{Q}_3^{(c)}(B_{1u}) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z258}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z259}} \quad \mathbb{Q}_2^{(c)}(B_{2g}) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z260}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z261}} \quad \mathbb{Q}_3^{(c)}(B_{2u}) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z481}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{2u}) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z542}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z543}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z544}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z545}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z603}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z604}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z665}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z666}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z733}} \quad \mathbb{Q}_{1,1}^{(1,0;c)}(E_u) = -\frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z734}} \quad \mathbb{Q}_{1,2}^{(1,0;c)}(E_u) = -\frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(s)}(A_{2u})}{2}$$

$$\boxed{\text{z735}} \quad \mathbb{G}_0^{(1,0;c)}(A_{1u}) = \mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_1^{(s)}(A_{2u})$$

$$\boxed{\text{z736}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}) = \mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_0^{(s)}(A_{1g})$$

$$\boxed{\text{z737}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

$$\boxed{\text{z738}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g) = \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(s)}(A_{1g})}{2}$$

• 'Ce'-'Co' bond-cluster

- \* bra:  $\langle p_x, \uparrow |, \langle p_x, \downarrow |, \langle p_y, \uparrow |, \langle p_y, \downarrow |, \langle p_z, \uparrow |, \langle p_z, \downarrow |$
- \* ket:  $|p_x, \uparrow \rangle, |p_x, \downarrow \rangle, |p_y, \uparrow \rangle, |p_y, \downarrow \rangle, |p_z, \uparrow \rangle, |p_z, \downarrow \rangle$
- \* wyckoff: **8a@8i**

$$\boxed{\text{z13}} \quad \mathbb{Q}_0^{(c)}(A_{1g}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z14}} \quad \mathbb{Q}_0^{(c)}(A_{1g}, b) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z15}} \quad \mathbb{Q}_2^{(c)}(A_{1g}, a) = \mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z16}} \quad \mathbb{Q}_2^{(c)}(A_{1g}, b) = \frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z17}} \quad \mathbb{Q}_2^{(c)}(A_{1g}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z18}} \quad \mathbb{Q}_0^{(1,-1;c)}(A_{1g}) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z19}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, a) = \mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z20}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, b) = \frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z21}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z22}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, d) = -\frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} - \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{5}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z23}} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{1g}, 1) = \frac{\sqrt{195}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{78} - \frac{\sqrt{13}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{195}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{78} - \frac{\sqrt{13}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} + \frac{5\sqrt{13}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{39}$$

$$\boxed{\text{z24}} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{1g}, 2) = -\frac{\sqrt{65}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{13} - \frac{\sqrt{65}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{13} + \frac{\sqrt{39}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{13}$$

$$\boxed{\text{z25}} \quad \mathbb{Q}_0^{(1,0;c)}(A_{1g}) = \frac{\sqrt{3}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z26}} \quad \mathbb{Q}_2^{(1,0;c)}(A_{1g}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z27}} \quad \mathbb{Q}_2^{(1,0;c)}(A_{1g}, b) = \mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z28}} \quad \mathbb{Q}_2^{(1,0;c)}(A_{1g}, c) = \frac{\sqrt{6}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z29}} \quad \mathbb{Q}_0^{(1,1;c)}(A_{1g}) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z30}} \quad \mathbb{Q}_2^{(1,1;c)}(A_{1g}) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z70}} \quad \mathbb{Q}_5^{(c)}(A_{1u}) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z71}} \quad \mathbb{Q}_5^{(1,-1;c)}(A_{1u}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z72}} \quad \mathbb{Q}_5^{(1,-1;c)}(A_{1u}, b) = \mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z73}} \quad \mathbb{Q}_4^{(c)}(A_{2g}) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_2^{(b)}(B_{1g})$$

$$\boxed{\text{z74}} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{2g}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_2^{(b)}(B_{1g})$$

$$\boxed{z75} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{2g}, b) = -\frac{\sqrt{15}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{8} + \frac{3\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{8} + \frac{\sqrt{15}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} - \frac{3\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} + \frac{\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{2}$$

$$\boxed{z76} \quad \mathbb{Q}_4^{(1,0;c)}(A_{2g}) = \mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_2^{(b)}(B_{1g})$$

$$\boxed{z77} \quad \mathbb{Q}_1^{(c)}(A_{2u}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})$$

$$\boxed{z78} \quad \mathbb{Q}_1^{(c)}(A_{2u}, b) = \frac{\sqrt{30}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{z79} \quad \mathbb{Q}_1^{(c)}(A_{2u}, c) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{z80} \quad \mathbb{Q}_1^{(c)}(A_{2u}, d) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{z81} \quad \mathbb{Q}_3^{(c)}(A_{2u}) = -\frac{\sqrt{5}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{5} - \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{5} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{z82} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, a) = \frac{\sqrt{30}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{z83} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, b) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{z84} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{z85} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, d) = \mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{z86} \quad \mathbb{Q}_3^{(1,-1;c)}(A_{2u}, a) = -\frac{\sqrt{5}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{5} - \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{5} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{z87} \quad \mathbb{Q}_3^{(1,-1;c)}(A_{2u}, b) = -\frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{4}$$

$$\boxed{z130} \quad \mathbb{Q}_1^{(1,0;c)}(A_{2u}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{z131} \quad \mathbb{Q}_1^{(1,0;c)}(A_{2u}, b) = \frac{\sqrt{30}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{30}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z132}} \quad \mathbb{Q}_1^{(1,0;c)}(A_{2u}, c) = \mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z133}} \quad \mathbb{Q}_3^{(1,0;c)}(A_{2u}) = -\frac{\sqrt{5}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{5} - \frac{\sqrt{5}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{5} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z134}} \quad \mathbb{Q}_1^{(1,1;c)}(A_{2u}, a) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})$$

$$\boxed{\text{z135}} \quad \mathbb{Q}_1^{(1,1;c)}(A_{2u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z136}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})$$

$$\boxed{\text{z137}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, b) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z138}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, c) = -\frac{\sqrt{30}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} - \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z139}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, d) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z140}} \quad \mathbb{Q}_4^{(c)}(B_{1g}) = \frac{\sqrt{5}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{5} - \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{5} - \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z141}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z142}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, b) = -\frac{\sqrt{30}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} - \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z143}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z144}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, d) = -\frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} + \frac{\sqrt{30}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} + \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{8} - \frac{\sqrt{30}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{8}$$

$$\boxed{\text{z145}} \quad \mathbb{Q}_4^{(1,-1;c)}(B_{1g}, a) = \frac{\sqrt{5}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{5} - \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{5} - \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z146}} \quad \mathbb{Q}_4^{(1,-1;c)}(B_{1g}, b) = -\frac{\sqrt{30}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} - \frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} + \frac{\sqrt{30}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{8} + \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{8}$$

$$\boxed{\text{z147}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{1g}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z190}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{1g}, b) = \mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z191}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{1g}, c) = -\frac{\sqrt{30}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{30}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{10} - \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z192}} \quad \mathbb{Q}_4^{(1,0;c)}(B_{1g}) = \frac{\sqrt{5}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{5} - \frac{\sqrt{5}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{5} - \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z193}} \quad \mathbb{Q}_2^{(1,1;c)}(B_{1g}, a) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})$$

$$\boxed{\text{z194}} \quad \mathbb{Q}_2^{(1,1;c)}(B_{1g}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z195}} \quad \mathbb{Q}_3^{(c)}(B_{1u}, a) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z196}} \quad \mathbb{Q}_3^{(c)}(B_{1u}, b) = \mathbb{M}_1^{(a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z197}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}, a) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z198}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}, b) = \mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z199}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}, c) = -\frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z200}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}, d) = -\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z201}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{1u}, a) = \mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z202}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{1u}, b) = \frac{\sqrt{3}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z203}} \quad \mathbb{Q}_3^{(1,1;c)}(B_{1u}) = \mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z204}} \quad \mathbb{Q}_2^{(c)}(B_{2g}, a) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z205}} \quad \mathbb{Q}_2^{(c)}(B_{2g}, b) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z206}} \quad \mathbb{Q}_2^{(c)}(B_{2g}, c) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z207}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z262}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, b) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z263}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, c) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z264}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, d) = -\frac{2\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{3} - \frac{2\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{3} - \frac{\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z265}} \quad \mathbb{Q}_4^{(1,-1;c)}(B_{2g}) = -\frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{12} - \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{12} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{4} + \frac{\sqrt{5}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z266}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{2g}, a) = -\frac{\sqrt{6}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z267}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{2g}, b) = \mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z268}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{2g}, c) = \frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z269}} \quad \mathbb{Q}_2^{(1,1;c)}(B_{2g}) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z270}} \quad \mathbb{Q}_3^{(c)}(B_{2u}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z271}} \quad \mathbb{Q}_3^{(c)}(B_{2u}, b) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z272}} \quad \mathbb{Q}_5^{(c)}(B_{2u}) = \mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z273}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{2u}, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z274}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{2u}, b) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{12} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{3}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z275}} \quad \mathbb{Q}_5^{(1,-1;c)}(B_{2u}) = \mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z276}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{2u}, a) = -\frac{\sqrt{3}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z277}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{2u}, b) = -\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z278}} \quad \mathbb{Q}_3^{(1,1;c)}(B_{2u}) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z279}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z280}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z281}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z282}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z283}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, c) = -\frac{\sqrt{15}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z284}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, c) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z285}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, d) = -\frac{\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z286}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, d) = \frac{\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z287}} \quad \mathbb{Q}_{4,1}^{(c)}(E_g, 1) = -\frac{7\sqrt{235}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470} - \frac{7\sqrt{235}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z288}} \quad \mathbb{Q}_{4,2}^{(c)}(E_g, 1) = \frac{7\sqrt{235}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470} + \frac{7\sqrt{235}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z289}} \quad \mathbb{Q}_{4,1}^{(c)}(E_g, 2) = \frac{3\sqrt{47}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{47} + \frac{3\sqrt{47}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z290}} \quad \mathbb{Q}_{4,2}^{(c)}(E_g, 2) = -\frac{3\sqrt{47}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{47} - \frac{3\sqrt{47}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z291}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z292}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z293}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, b) = -\frac{\sqrt{15}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z294}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, b) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z295}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, c) = -\frac{\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z296}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, c) = \frac{\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z297}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, d) = \frac{\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{8} - \frac{\sqrt{15}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{8} + \frac{\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z298}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, d) = -\frac{\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{8} + \frac{\sqrt{15}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{8} - \frac{\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z299}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 1a) = -\frac{7\sqrt{235}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470} - \frac{7\sqrt{235}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z300}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 1a) = \frac{7\sqrt{235}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470} + \frac{7\sqrt{235}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z301}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 1b) = \frac{\sqrt{5055}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{2696} - \frac{47\sqrt{337}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{2696} - \frac{3\sqrt{5055}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{674} \\ - \frac{8\sqrt{337}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{337} - \frac{6\sqrt{337}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{337}$$

$$\boxed{\text{z302}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 1b) = -\frac{\sqrt{5055}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{2696} + \frac{47\sqrt{337}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{2696} + \frac{3\sqrt{5055}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{674} \\ + \frac{8\sqrt{337}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{337} - \frac{6\sqrt{337}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{337}$$

$$\boxed{\text{z303}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 2a) = \frac{3\sqrt{47}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{47} + \frac{3\sqrt{47}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z304}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 2a) = -\frac{3\sqrt{47}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{47} - \frac{3\sqrt{47}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z305}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 2b) = -\frac{55\sqrt{10110}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{10784} - \frac{111\sqrt{674}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{10784} \\ - \frac{7\sqrt{10110}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{5392} + \frac{75\sqrt{674}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{5392} - \frac{7\sqrt{674}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{1348}$$

$$\boxed{\text{z306}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 2b) = \frac{55\sqrt{10110}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{10784} + \frac{111\sqrt{674}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{10784} \\ + \frac{7\sqrt{10110}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{5392} - \frac{75\sqrt{674}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{5392} - \frac{7\sqrt{674}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{1348}$$

$$\boxed{\text{z307}} \quad \mathbb{Q}_{2,1}^{(1,0;c)}(E_g, a) = -\frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z308}} \quad \mathbb{Q}_{2,2}^{(1,0;c)}(E_g, a) = \frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z309}} \quad \mathbb{Q}_{2,1}^{(1,0;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z310}} \quad \mathbb{Q}_{2,2}^{(1,0;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z311}} \quad \mathbb{Q}_{2,1}^{(1,0;c)}(E_g, c) = -\frac{\sqrt{15}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{10} - \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z312}} \quad \mathbb{Q}_{2,2}^{(1,0;c)}(E_g, c) = \frac{\sqrt{15}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z313}} \quad \mathbb{Q}_{4,1}^{(1,0;c)}(E_g, 1) = -\frac{7\sqrt{235}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{470} - \frac{7\sqrt{235}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z314}} \quad \mathbb{Q}_{4,2}^{(1,0;c)}(E_g, 1) = \frac{7\sqrt{235}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{470} + \frac{7\sqrt{235}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z315}} \quad \mathbb{Q}_{4,1}^{(1,0;c)}(E_g, 2) = \frac{3\sqrt{47}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{47} + \frac{3\sqrt{47}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z316}} \quad \mathbb{Q}_{4,2}^{(1,0;c)}(E_g, 2) = -\frac{3\sqrt{47}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{47} - \frac{3\sqrt{47}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z317}} \quad \mathbb{Q}_{2,1}^{(1,1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z318}} \quad \mathbb{Q}_{2,2}^{(1,1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z319}} \quad \mathbb{Q}_{2,1}^{(1,1;c)}(E_g, b) = -\frac{\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z320}} \quad \mathbb{Q}_{2,2}^{(1,1;c)}(E_g, b) = \frac{\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z321}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z322}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z323}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, b) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z324}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, b) = \frac{\sqrt{15}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z325}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, c) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z326}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, c) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z327}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, d) = -\frac{\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z328}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, d) = -\frac{\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z329}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, e) = -\frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z330}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, e) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z331}} \quad \mathbb{Q}_{3,1}^{(c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} + \frac{3\sqrt{10}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z332}} \quad \mathbb{Q}_{3,2}^{(c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{3\sqrt{10}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z333}} \quad \mathbb{Q}_{3,1}^{(c)}(E_u, 2) = -\frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z482}} \quad \mathbb{Q}_{3,2}^{(c)}(E_u, 2) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z483}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, a) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z484}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, a) = \frac{\sqrt{15}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z485}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, b) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z486}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, b) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z487}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, c) = -\frac{\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z488}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, c) = -\frac{\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z489}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, d) = -\frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z490}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, d) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z491}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, e) = \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{2u})}{4} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{2u})}{4}$$

$$\boxed{\text{z492}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, e) = -\frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{2u})}{4} + \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{2u})}{4}$$

$$\boxed{\text{z493}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 1a) = -\frac{\sqrt{10}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} + \frac{3\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z494}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 1a) = -\frac{\sqrt{10}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{3\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z495}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 1b) = \frac{\sqrt{6}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{10}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z496}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 1b) = \frac{\sqrt{6}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{10}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z497}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 2a) = -\frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z498}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 2a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z499}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 2b) = -\frac{\sqrt{10}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{6}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{24} + \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8} + \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{24}$$

$$\boxed{\text{z546}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 2b) = -\frac{\sqrt{10}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{6}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{24} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{24}$$

$$\boxed{\text{z547}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 2c) = -\frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{2u})}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{2u})}{4}$$

$$\boxed{\text{z548}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 2c) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{2u})}{4} + \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{2u})}{4}$$

$$\boxed{\text{z549}} \quad \mathbb{Q}_{1,1}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z550}} \quad \mathbb{Q}_{1,2}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z551}} \quad \mathbb{Q}_{1,1}^{(1,0;c)}(E_u, b) = \frac{\sqrt{15}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z552}} \quad \mathbb{Q}_{1,2}^{(1,0;c)}(E_u, b) = \frac{\sqrt{15}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10} - \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z553}} \quad \mathbb{Q}_{1,1}^{(1,0;c)}(E_u, c) = -\frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z554}} \quad \mathbb{Q}_{1,2}^{(1,0;c)}(E_u, c) = \frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z555}} \quad \mathbb{Q}_{3,1}^{(1,0;c)}(E_u, 1a) = -\frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z556}} \quad \mathbb{Q}_{3,2}^{(1,0;c)}(E_u, 1a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z557}} \quad \mathbb{Q}_{3,1}^{(1,0;c)}(E_u, 1b) = -\frac{\sqrt{10}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{20} + \frac{3\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z558}} \quad \mathbb{Q}_{3,2}^{(1,0;c)}(E_u, 1b) = -\frac{\sqrt{10}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{20} - \frac{3\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z559}} \quad \mathbb{Q}_{3,1}^{(1,0;c)}(E_u, 2) = -\frac{\sqrt{6}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z560}} \quad \mathbb{Q}_{3,2}^{(1,0;c)}(E_u, 2) = -\frac{\sqrt{6}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z561}} \quad \mathbb{Q}_{1,1}^{(1,1;c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z562}} \quad \mathbb{Q}_{1,2}^{(1,1;c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z563}} \quad \mathbb{Q}_{1,1}^{(1,1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z605}} \quad \mathbb{Q}_{1,2}^{(1,1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z606}} \quad \mathbb{Q}_{1,1}^{(1,1;c)}(E_u, c) = -\frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z607}} \quad \mathbb{Q}_{1,2}^{(1,1;c)}(E_u, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z608}} \quad \mathbb{G}_0^{(c)}(A_{1u}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z609}} \quad \mathbb{G}_2^{(c)}(A_{1u}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z610}} \quad \mathbb{G}_2^{(c)}(A_{1u}, b) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z611}} \quad \mathbb{G}_0^{(1,-1;c)}(A_{1u}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z612}} \quad \mathbb{G}_2^{(1,-1;c)}(A_{1u}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z613}} \quad \mathbb{G}_2^{(1,-1;c)}(A_{1u}, b) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z614}} \quad \mathbb{G}_2^{(1,-1;c)}(A_{1u}, c) = -\frac{\sqrt{21}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} - \frac{\sqrt{35}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{35}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{7}$$

$$\boxed{\text{z615}} \quad \mathbb{G}_4^{(1,-1;c)}(A_{1u}, 1) = \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z616}} \quad \mathbb{G}_4^{(1,-1;c)}(A_{1u}, 2) = -\frac{\sqrt{105}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{42} + \frac{3\sqrt{7}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{105}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{42} \\ - \frac{3\sqrt{7}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{105}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{21}$$

$$\boxed{\text{z617}} \quad \mathbb{G}_0^{(1,0;c)}(A_{1u}, a) = \frac{\sqrt{3}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z618}} \quad \mathbb{G}_0^{(1,0;c)}(A_{1u}, b) = \mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z619}} \quad \mathbb{G}_2^{(1,0;c)}(A_{1u}, a) = -\frac{\sqrt{6}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z620}} \quad \mathbb{G}_2^{(1,0;c)}(A_{1u}, b) = -\frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z621}} \quad \mathbb{G}_0^{(1,1;c)}(A_{1u}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z622}} \quad \mathbb{G}_2^{(1,1;c)}(A_{1u}) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z667}} \quad \mathbb{G}_1^{(c)}(A_{2g}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z668}} \quad \mathbb{G}_1^{(c)}(A_{2g}, b) = \mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z669}} \quad \mathbb{G}_1^{(c)}(A_{2g}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z670}} \quad \mathbb{G}_1^{(1,-1;c)}(A_{2g}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z671}} \quad \mathbb{G}_1^{(1,-1;c)}(A_{2g}, b) = \mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z672}} \quad \mathbb{G}_1^{(1,-1;c)}(A_{2g}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z673}} \quad \mathbb{G}_1^{(1,-1;c)}(A_{2g}, d) = -\frac{11\sqrt{237}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{632} - \frac{19\sqrt{395}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{632} + \frac{11\sqrt{237}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{632} \\ + \frac{19\sqrt{395}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{632} + \frac{3\sqrt{395}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{158}$$

$$\boxed{\text{z674}} \quad \mathbb{G}_3^{(1,-1;c)}(A_{2g}, a) = \mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z675}} \quad \mathbb{G}_3^{(1,-1;c)}(A_{2g}, b) = -\frac{7\sqrt{395}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{316} - \frac{\sqrt{237}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{316} + \frac{7\sqrt{395}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{316} \\ + \frac{\sqrt{237}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{316} - \frac{4\sqrt{237}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{79}$$

$$\boxed{\text{z676}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}, a) = \mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z677}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}, b) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z678}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}, c) = -\frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z679}} \quad \mathbb{G}_1^{(1,1;c)}(A_{2g}, a) = \mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z680}} \quad \mathbb{G}_1^{(1,1;c)}(A_{2g}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z681}} \quad \mathbb{G}_4^{(1,-1;c)}(A_{2u}) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{4}$$

$$\boxed{\text{z682}} \quad \mathbb{G}_3^{(1,-1;c)}(B_{1g}) = \mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z683}} \quad \mathbb{G}_2^{(c)}(B_{1u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z684}} \quad \mathbb{G}_2^{(c)}(B_{1u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z739}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{1u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z740}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{1u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z741}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{1u}, c) = \frac{3\sqrt{7}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} - \frac{\sqrt{105}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{42} + \frac{3\sqrt{7}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} \\ - \frac{\sqrt{105}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{42} + \frac{\sqrt{105}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{21}$$

$$\boxed{\text{z742}} \quad \mathbb{G}_4^{(1,-1;c)}(B_{1u}) = \frac{\sqrt{35}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{35}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} - \frac{\sqrt{21}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{7}$$

$$\boxed{\text{z743}} \quad \mathbb{G}_2^{(1,0;c)}(B_{1u}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z744}} \quad \mathbb{G}_2^{(1,0;c)}(B_{1u}, b) = -\frac{\sqrt{6}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z745}} \quad \mathbb{G}_2^{(1,1;c)}(B_{1u}) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z746}} \quad \mathbb{G}_3^{(c)}(B_{2g}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z747}} \quad \mathbb{G}_3^{(1,-1;c)}(B_{2g}, a) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z748}} \quad \mathbb{G}_3^{(1,-1;c)}(B_{2g}, b) = \mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z749}} \quad \mathbb{G}_3^{(1,-1;c)}(B_{2g}, c) = \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{12} - \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{4} + \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{12} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{4} - \frac{\sqrt{3}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z750}} \quad \mathbb{G}_3^{(1,0;c)}(B_{2g}) = \frac{\sqrt{3}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z751}} \quad \mathbb{G}_3^{(1,1;c)}(B_{2g}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z752}} \quad \mathbb{G}_2^{(c)}(B_{2u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z753}} \quad \mathbb{G}_2^{(c)}(B_{2u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z754}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{2u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z755}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{2u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z756}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{2u}, c) = -\frac{\sqrt{7}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{7} + \frac{\sqrt{105}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{21} + \frac{\sqrt{7}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{7} \\ - \frac{\sqrt{105}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{21} + \frac{\sqrt{105}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{21}$$

$$\boxed{\text{z757}} \quad \mathbb{G}_4^{(1,-1;c)}(B_{2u}) = -\frac{\sqrt{35}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{28} - \frac{3\sqrt{21}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{28} + \frac{\sqrt{35}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{28} + \frac{3\sqrt{21}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{28} + \frac{\sqrt{21}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{7}$$

$$\boxed{\text{z758}} \quad \mathbb{G}_2^{(1,0;c)}(B_{2u}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z759}} \quad \mathbb{G}_2^{(1,0;c)}(B_{2u}, b) = -\frac{\sqrt{6}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z760}} \quad \mathbb{G}_2^{(1,1;c)}(B_{2u}) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z761}} \quad \mathbb{G}_{1,1}^{(c)}(E_g, a) = \frac{\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z762}} \quad \mathbb{G}_{1,2}^{(c)}(E_g, a) = -\frac{\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z763}} \quad \mathbb{G}_{1,1}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z764}} \quad \mathbb{G}_{1,2}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z765}} \quad \mathbb{G}_{1,1}^{(c)}(E_g, c) = \frac{\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z766}} \quad \mathbb{G}_{1,2}^{(c)}(E_g, c) = -\frac{\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z767}} \quad \mathbb{G}_{1,1}^{(1,-1;c)}(E_g, a) = \frac{\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z768}} \quad \mathbb{G}_{1,2}^{(1,-1;c)}(E_g, a) = -\frac{\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z769}} \quad \mathbb{G}_{1,1}^{(1,-1;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z770}} \quad \mathbb{G}_{1,2}^{(1,-1;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z771}} \quad \mathbb{G}_{1,1}^{(1,-1;c)}(E_g, c) = \frac{\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z772}} \quad \mathbb{G}_{1,2}^{(1,-1;c)}(E_g, c) = -\frac{\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z773}} \quad \mathbb{G}_{1,1}^{(1,-1;c)}(E_g, d) = \frac{43\sqrt{474}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{2528} - \frac{25\sqrt{790}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{2528} - \frac{21\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{1264} \\ + \frac{13\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{1264} + \frac{3\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{316}$$

$$\boxed{\text{z774}} \quad \mathbb{G}_{1,2}^{(1,-1;c)}(E_g, d) = -\frac{43\sqrt{474}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{2528} + \frac{25\sqrt{790}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{2528} + \frac{21\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{1264} \\ - \frac{13\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{1264} + \frac{3\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{316}$$

$$\boxed{\text{z775}} \quad \mathbb{G}_{3,1}^{(1,-1;c)}(E_g, 1a) = \frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z776}} \quad \mathbb{G}_{3,2}^{(1,-1;c)}(E_g, 1a) = \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z777}} \quad \mathbb{G}_{3,1}^{(1,-1;c)}(E_g, 1b) = -\frac{13\sqrt{790}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{1264} - \frac{7\sqrt{474}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{1264} - \frac{\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{632} \\ - \frac{9\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{632} + \frac{2\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{79}$$

$$\boxed{\text{z778}} \quad \mathbb{G}_{3,2}^{(1,-1;c)}(E_g, 1b) = \frac{13\sqrt{790}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{1264} + \frac{7\sqrt{474}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{1264} + \frac{\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{632} \\ + \frac{9\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{632} + \frac{2\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{79}$$

$$\boxed{\text{z779}} \quad \mathbb{G}_{3,1}^{(1,-1;c)}(E_g, 2) = \frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z780}} \quad \mathbb{G}_{3,2}^{(1,-1;c)}(E_g, 2) = \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z781}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z782}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z783}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g, b) = \frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z784}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g, b) = -\frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z785}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g, c) = \frac{\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z786}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g, c) = -\frac{\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z787}} \quad \mathbb{G}_{1,1}^{(1,1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z788}} \quad \mathbb{G}_{1,2}^{(1,1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z789}} \quad \mathbb{G}_{1,1}^{(1,1;c)}(E_g, b) = \frac{\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z790}} \quad \mathbb{G}_{1,2}^{(1,1;c)}(E_g, b) = -\frac{\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z791}} \quad \mathbb{G}_{2,1}^{(c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z792}} \quad \mathbb{G}_{2,2}^{(c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z793}} \quad \mathbb{G}_{2,1}^{(c)}(E_u, b) = -\frac{\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z794}} \quad \mathbb{G}_{2,2}^{(c)}(E_u, b) = -\frac{\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z795}} \quad \mathbb{G}_{2,1}^{(1,-1;c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z796}} \quad \mathbb{G}_{2,2}^{(1,-1;c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z797}} \quad \mathbb{G}_{2,1}^{(1,-1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z798}} \quad \mathbb{G}_{2,2}^{(1,-1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z799}} \quad \mathbb{G}_{2,1}^{(1,-1;c)}(E_u, c) = \frac{\sqrt{14}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{14} + \frac{\sqrt{210}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{42} - \frac{\sqrt{14}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{42} - \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{42}$$

$$\boxed{\text{z800}} \quad \mathbb{G}_{2,2}^{(1,-1;c)}(E_u, c) = \frac{\sqrt{14}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{14} + \frac{\sqrt{210}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{42} + \frac{\sqrt{14}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{14} - \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{42} - \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{42}$$

$$\boxed{\text{z801}} \quad \mathbb{G}_{4,1}^{(1,-1;c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{6}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z802}} \quad \mathbb{G}_{4,2}^{(1,-1;c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{6}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z803}} \quad \mathbb{G}_{4,1}^{(1,-1;c)}(E_u, 2) = \frac{\sqrt{70}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{56} - \frac{3\sqrt{42}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{56} - \frac{\sqrt{70}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{56} + \frac{\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{3\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{56}$$

$$\boxed{\text{z804}} \quad \mathbb{G}_{4,2}^{(1,-1;c)}(E_u, 2) = \frac{\sqrt{70}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{56} - \frac{3\sqrt{42}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{56} + \frac{\sqrt{70}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{56} - \frac{\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{3\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{56}$$

$$\boxed{\text{z805}} \quad \mathbb{G}_{2,1}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z806}} \quad \mathbb{G}_{2,2}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z807}} \quad \mathbb{G}_{2,1}^{(1,0;c)}(E_u, b) = -\frac{\sqrt{3}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z808}} \quad \mathbb{G}_{2,2}^{(1,0;c)}(E_u, b) = -\frac{\sqrt{3}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z809}} \quad \mathbb{G}_{2,1}^{(1,1;c)}(E_u) = -\frac{\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z810}} \quad \mathbb{G}_{2,2}^{(1,1;c)}(E_u) = -\frac{\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

• 'Ce'-'Si' bond-cluster

- \* bra:  $\langle p_x, \uparrow |, \langle p_x, \downarrow |, \langle p_y, \uparrow |, \langle p_y, \downarrow |, \langle p_z, \uparrow |, \langle p_z, \downarrow |$
- \* ket:  $|p_x, \uparrow \rangle, |p_x, \downarrow \rangle, |p_y, \uparrow \rangle, |p_y, \downarrow \rangle, |p_z, \uparrow \rangle, |p_z, \downarrow \rangle$
- \* wyckoff: 8a@8j

$$\boxed{\text{z31}} \quad \mathbb{Q}_0^{(c)}(A_{1g}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z32}} \quad \mathbb{Q}_0^{(c)}(A_{1g}, b) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_2^{(b)}(B_{2g})}{3}$$

$$\boxed{\text{z33}} \quad \mathbb{Q}_0^{(c)}(A_{1g}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z34}} \quad \mathbb{Q}_2^{(c)}(A_{1g}, a) = \mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z35}} \quad \mathbb{Q}_2^{(c)}(A_{1g}, b) = \frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_2^{(b)}(B_{2g})}{3}$$

$$\boxed{\text{z36}} \quad \mathbb{Q}_0^{(1,-1;c)}(A_{1g}, a) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_2^{(b)}(B_{2g})}{3}$$

$$\boxed{\text{z37}} \quad \mathbb{Q}_0^{(1,-1;c)}(A_{1g}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z38}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, a) = \mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z39}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, b) = \frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_2^{(b)}(B_{2g})}{3}$$

$$\boxed{\text{z40}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, c) = \mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z41}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, d) = -\frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,1}^{(b)}(E_g)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,1}^{(b)}(E_g)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,2}^{(b)}(E_g)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,2}^{(b)}(E_g)}{4}$$

$$\boxed{\text{z42}} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{1g}, 1) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,1}^{(b)}(E_g)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,1}^{(b)}(E_g)}{4} + \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,2}^{(b)}(E_g)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,2}^{(b)}(E_g)}{4}$$

$$\boxed{\text{z43}} \quad \mathbb{Q}_0^{(1,0;c)}(A_{1g}) = \mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z44}} \quad \mathbb{Q}_2^{(1,0;c)}(A_{1g}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z45}} \quad \mathbb{Q}_2^{(1,0;c)}(A_{1g}, b) = \mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z46}} \quad \mathbb{Q}_2^{(1,0;c)}(A_{1g}, c) = -\frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z47}} \quad \mathbb{Q}_0^{(1,1;c)}(A_{1g}, a) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z48}} \quad \mathbb{Q}_0^{(1,1;c)}(A_{1g}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z88}} \quad \mathbb{Q}_5^{(c)}(A_{1u}) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_3^{(b)}(B_{1u})$$

$$\boxed{\text{z89}} \quad \mathbb{Q}_5^{(1,-1;c)}(A_{1u}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_3^{(b)}(B_{1u})$$

$$\boxed{\text{z90}} \quad \mathbb{Q}_5^{(1,-1;c)}(A_{1u}, b) = \mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{M}_2^{(b)}(B_{1u})$$

$$\boxed{\text{z91}} \quad \mathbb{Q}_4^{(c)}(A_{2g}) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z92}} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{2g}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z93}} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{2g}, b) = -\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z94}} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{2g}, c) = -\frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,2}^{(b)}(E_g)}{4} + \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,2}^{(b)}(E_g)}{4} + \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,1}^{(b)}(E_g)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,1}^{(b)}(E_g)}{4}$$

$$\boxed{\text{z95}} \quad \mathbb{Q}_4^{(1,0;c)}(A_{2g}) = \mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z96}} \quad \mathbb{Q}_1^{(c)}(A_{2u}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})$$

$$\boxed{\text{z97}} \quad \mathbb{Q}_1^{(c)}(A_{2u}, b) = \frac{\sqrt{30}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z98}} \quad \mathbb{Q}_1^{(c)}(A_{2u}, c) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_3^{(b)}(B_{1u})$$

$$\boxed{\text{z99}} \quad \mathbb{Q}_1^{(c)}(A_{2u}, d) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z100}} \quad \mathbb{Q}_3^{(c)}(A_{2u}) = -\frac{\sqrt{5}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{5} - \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{5} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z101}} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, a) = \frac{\sqrt{30}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z102}} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, b) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_3^{(b)}(B_{1u})$$

$$\boxed{\text{z103}} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z104}} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, d) = \mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{M}_2^{(b)}(B_{1u})$$

$$\boxed{\text{z105}} \quad \mathbb{Q}_3^{(1,-1;c)}(A_{2u}, a) = -\frac{\sqrt{5}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{5} - \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{5} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z148}} \quad \mathbb{Q}_3^{(1,-1;c)}(A_{2u}, b) = -\frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{4}$$

$$\boxed{\text{z149}} \quad \mathbb{Q}_1^{(1,0;c)}(A_{2u}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z150}} \quad \mathbb{Q}_1^{(1,0;c)}(A_{2u}, b) = \frac{\sqrt{30}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{30}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z151}} \quad \mathbb{Q}_1^{(1,0;c)}(A_{2u}, c) = -\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{M}_2^{(b)}(B_{1u})$$

$$\boxed{\text{z152}} \quad \mathbb{Q}_3^{(1,0;c)}(A_{2u}) = -\frac{\sqrt{5}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{5} - \frac{\sqrt{5}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{5} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z153}} \quad \mathbb{Q}_1^{(1,1;c)}(A_{2u}, a) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})$$

$$\boxed{\text{z154}} \quad \mathbb{Q}_1^{(1,1;c)}(A_{2u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z155}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, a) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z156}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, b) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z157}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, c) = -\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z158}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, d) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z159}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z160}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, b) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z161}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, c) = -\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z162}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, d) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z163}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, e) = \mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z164}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, f) = \frac{3\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,1}^{(b)}(E_g)}{8} - \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,1}^{(b)}(E_g)}{8} - \frac{3\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,2}^{(b)}(E_g)}{8} + \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,2}^{(b)}(E_g)}{8}$$

$$\boxed{\text{z165}} \quad \mathbb{Q}_4^{(1,-1;c)}(B_{1g}) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,1}^{(b)}(E_g)}{8} + \frac{3\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,1}^{(b)}(E_g)}{8} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,2}^{(b)}(E_g)}{8} - \frac{3\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,2}^{(b)}(E_g)}{8}$$

$$\boxed{\text{z208}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{1g}, a) = \frac{\sqrt{6}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_2^{(b)}(B_{2g})}{3}$$

$$\boxed{\text{z209}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{1g}, b) = \mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z210}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{1g}, c) = -\frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z211}} \quad \mathbb{Q}_2^{(1,1;c)}(B_{1g}, a) = -\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z212}} \quad \mathbb{Q}_2^{(1,1;c)}(B_{1g}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z213}} \quad \mathbb{Q}_3^{(c)}(B_{1u}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{1u})$$

$$\boxed{\text{z214}} \quad \mathbb{Q}_3^{(c)}(B_{1u}, b) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z215}} \quad \mathbb{Q}_5^{(c)}(B_{1u}) = -\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{1u})$$

$$\boxed{\text{z216}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}, a) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z217}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}, b) = -\frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z218}} \quad \mathbb{Q}_5^{(1,-1;c)}(B_{1u}) = -\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{1u})$$

$$\boxed{\text{z219}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{1u}, a) = \frac{\sqrt{3}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z220}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{1u}, b) = \mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{M}_2^{(b)}(B_{1u})$$

$$\boxed{\text{z221}} \quad \mathbb{Q}_3^{(1,1;c)}(B_{1u}) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{1u})$$

$$\boxed{\text{z222}} \quad \mathbb{Q}_2^{(c)}(B_{2g}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z223}} \quad \mathbb{Q}_2^{(c)}(B_{2g}, b) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z224}} \quad \mathbb{Q}_2^{(c)}(B_{2g}, c) = \frac{\sqrt{30}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} - \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{2g})}{5}$$

$$\boxed{\text{z225}} \quad \mathbb{Q}_2^{(c)}(B_{2g}, d) = -\frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z334}} \quad \mathbb{Q}_4^{(c)}(B_{2g}) = \frac{\sqrt{5}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{5} + \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{5} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{2g})}{5}$$

$$\boxed{\text{z335}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z336}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, b) = \frac{\sqrt{30}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} - \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{2g})}{5}$$

$$\boxed{\text{z337}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, c) = -\frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z338}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, d) = \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,2}^{(b)}(E_g)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,2}^{(b)}(E_g)}{4} + \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,1}^{(b)}(E_g)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,1}^{(b)}(E_g)}{4}$$

$$\boxed{\text{z339}} \quad \mathbb{Q}_4^{(1,-1;c)}(B_{2g}, a) = \frac{\sqrt{5}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{5} + \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{5} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{2g})}{5}$$

$$\boxed{\text{z340}} \quad \mathbb{Q}_4^{(1,-1;c)}(B_{2g}, b) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,2}^{(b)}(E_g)}{4} + \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,2}^{(b)}(E_g)}{4} + \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,1}^{(b)}(E_g)}{4} + \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,1}^{(b)}(E_g)}{4}$$

$$\boxed{\text{z341}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{2g}, a) = -\frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z342}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{2g}, b) = \mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z343}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{2g}, c) = -\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z344}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{2g}, d) = \frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z345}} \quad \mathbb{Q}_2^{(1,1;c)}(B_{2g}, a) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{2g})$$

$$\boxed{\text{z346}} \quad \mathbb{Q}_2^{(1,1;c)}(B_{2g}, b) = -\frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z347}} \quad \mathbb{Q}_3^{(c)}(B_{2u}, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z348}} \quad \mathbb{Q}_3^{(c)}(B_{2u}, b) = \mathbb{M}_1^{(a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{1u})$$

$$\boxed{\text{z349}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{2u}, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z350}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{2u}, b) = \mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{1u})$$

$$\boxed{\text{z351}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{2u}, c) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{12} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{3}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z352}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{2u}, d) = -\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{1u})$$

$$\boxed{\text{z353}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{2u}, a) = -\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_3^{(b)}(B_{1u})$$

$$\boxed{\text{z354}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{2u}, b) = -\frac{\sqrt{3}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z355}} \quad \mathbb{Q}_3^{(1,1;c)}(B_{2u}) = \mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{1u})$$

$$\boxed{\text{z356}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z357}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z358}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z359}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z360}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, c) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z361}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, c) = \frac{\sqrt{15}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z362}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, d) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z363}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, d) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z364}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, e) = -\frac{\sqrt{2}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z365}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, e) = \frac{\sqrt{2}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z366}} \quad \mathbb{Q}_{4,1}^{(c)}(E_g, 1) = -\frac{\sqrt{6}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{4} - \frac{\sqrt{2}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{4}$$

$$\boxed{\text{z367}} \quad \mathbb{Q}_{4,2}^{(c)}(E_g, 1) = -\frac{\sqrt{6}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{4} + \frac{\sqrt{2}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{4}$$

$$\boxed{\text{z368}} \quad \mathbb{Q}_{4,1}^{(c)}(E_g, 2) = \frac{\sqrt{10}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{20} + \frac{3\sqrt{10}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{20} + \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z369}} \quad \mathbb{Q}_{4,2}^{(c)}(E_g, 2) = \frac{\sqrt{10}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{20} - \frac{3\sqrt{10}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{20} + \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z370}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z371}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z372}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, b) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z373}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, b) = \frac{\sqrt{15}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z374}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, c) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z375}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z376}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, d) = -\frac{\sqrt{2}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z377}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, d) = \frac{\sqrt{2}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z378}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, e) = \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z379}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, e) = \frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z380}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, f) = \frac{\sqrt{78}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{26} + \frac{\sqrt{130}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{M}_{1,1}^{(b)}(E_g)}{26} + \frac{\sqrt{130}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{26}$$

$$\boxed{\text{z381}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, f) = -\frac{\sqrt{78}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{26} - \frac{\sqrt{130}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{M}_{1,2}^{(b)}(E_g)}{26} + \frac{\sqrt{130}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{26}$$

$$\boxed{\text{z382}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 1a) = -\frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{4} - \frac{\sqrt{2}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{4}$$

$$\boxed{\text{z383}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 1a) = -\frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{4} + \frac{\sqrt{2}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{4}$$

$$\boxed{\text{z384}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 1b) = \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z385}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 1b) = \frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z386}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 1c) = \frac{7\sqrt{1430}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{572} - \frac{5\sqrt{858}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{M}_{1,1}^{(b)}(E_g)}{286} + \frac{3\sqrt{858}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{572}$$

$$\boxed{\text{z387}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 1c) = -\frac{7\sqrt{1430}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{572} + \frac{5\sqrt{858}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{M}_{1,2}^{(b)}(E_g)}{286} + \frac{3\sqrt{858}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{572}$$

$$\boxed{\text{z388}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 2a) = \frac{\sqrt{10}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{20} + \frac{3\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{20} + \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z389}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 2a) = \frac{\sqrt{10}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{20} - \frac{3\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{20} + \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z390}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 2b) = \frac{\sqrt{330}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{44} + \frac{\sqrt{22}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{M}_{1,1}^{(b)}(E_g)}{22} - \frac{5\sqrt{22}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{44}$$

$$\boxed{\text{z391}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 2b) = -\frac{\sqrt{330}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{44} - \frac{\sqrt{22}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{M}_{1,2}^{(b)}(E_g)}{22} - \frac{5\sqrt{22}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{44}$$

$$\boxed{\text{z392}} \quad \mathbb{Q}_{2,1}^{(1,0;c)}(E_g, a) = \frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z393}} \quad \mathbb{Q}_{2,2}^{(1,0;c)}(E_g, a) = \frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z394}} \quad \mathbb{Q}_{2,1}^{(1,0;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z395}} \quad \mathbb{Q}_{2,2}^{(1,0;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z396}} \quad \mathbb{Q}_{2,1}^{(1,0;c)}(E_g, c) = \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z397}} \quad \mathbb{Q}_{2,2}^{(1,0;c)}(E_g, c) = \frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z398}} \quad \mathbb{Q}_{2,1}^{(1,0;c)}(E_g, d) = \frac{\sqrt{30}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{M}_{1,1}^{(b)}(E_g)}{10} + \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{M}_{1,1}^{(b)}(E_g)}{10} - \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z399}} \quad \mathbb{Q}_{2,2}^{(1,0;c)}(E_g, d) = \frac{\sqrt{30}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{M}_{1,2}^{(b)}(E_g)}{10} - \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{M}_{1,2}^{(b)}(E_g)}{10} - \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z400}} \quad \mathbb{Q}_{2,1}^{(1,1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z401}} \quad \mathbb{Q}_{2,2}^{(1,1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z402}} \quad \mathbb{Q}_{2,1}^{(1,1;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z403}} \quad \mathbb{Q}_{2,2}^{(1,1;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{2g})}{2}$$

$$\boxed{\text{z404}} \quad \mathbb{Q}_{2,1}^{(1,1;c)}(E_g, c) = -\frac{\sqrt{2}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z405}} \quad \mathbb{Q}_{2,2}^{(1,1;c)}(E_g, c) = \frac{\sqrt{2}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z500}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z501}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z502}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, b) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z503}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, b) = \frac{\sqrt{15}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z504}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, c) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_3^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z505}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, c) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_3^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z506}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, d) = -\frac{\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z507}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, d) = -\frac{\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z508}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, e) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{M}_2^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z509}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, e) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{M}_2^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z510}} \quad \mathbb{Q}_{3,1}^{(c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} + \frac{3\sqrt{10}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z511}} \quad \mathbb{Q}_{3,2}^{(c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{3\sqrt{10}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z512}} \quad \mathbb{Q}_{3,1}^{(c)}(E_u, 2) = -\frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z513}} \quad \mathbb{Q}_{3,2}^{(c)}(E_u, 2) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z514}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, a) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z515}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, a) = \frac{\sqrt{15}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z516}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, b) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z517}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, b) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z564}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, c) = -\frac{\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z565}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, c) = -\frac{\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z566}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, d) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z567}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, d) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z568}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, e) = \frac{3\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{1u})}{8} - \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{1u})}{8}$$

$$\boxed{\text{z569}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, e) = \frac{3\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{1u})}{8} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{1u})}{8}$$

$$\boxed{\text{z570}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 1a) = -\frac{\sqrt{10}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} + \frac{3\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z571}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 1a) = -\frac{\sqrt{10}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{3\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z572}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 1b) = \frac{\sqrt{6}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{10}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z573}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 1b) = \frac{\sqrt{6}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{10}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z574}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 1c) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{1u})}{8} + \frac{3\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{1u})}{8}$$

$$\boxed{\text{z575}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 1c) = \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{1u})}{8} + \frac{3\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{1u})}{8}$$

$$\boxed{\text{z576}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 2a) = -\frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z577}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 2a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z578}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 2b) = -\frac{\sqrt{10}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{6}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{24} + \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8} + \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{24}$$

$$\boxed{\text{z579}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 2b) = -\frac{\sqrt{10}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{6}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{24} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{24}$$

$$\boxed{\text{z580}} \quad \mathbb{Q}_{1,1}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z581}} \quad \mathbb{Q}_{1,2}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z623}} \quad \mathbb{Q}_{1,1}^{(1,0;c)}(E_u, b) = \frac{\sqrt{15}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z624}} \quad \mathbb{Q}_{1,2}^{(1,0;c)}(E_u, b) = \frac{\sqrt{15}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10} - \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z625}} \quad \mathbb{Q}_{1,1}^{(1,0;c)}(E_u, c) = \frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{M}_2^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z626}} \quad \mathbb{Q}_{1,2}^{(1,0;c)}(E_u, c) = \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{M}_2^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z627}} \quad \mathbb{Q}_{3,1}^{(1,0;c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{20} + \frac{3\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z628}} \quad \mathbb{Q}_{3,2}^{(1,0;c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{20} - \frac{3\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z629}} \quad \mathbb{Q}_{3,1}^{(1,0;c)}(E_u, 2a) = -\frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z630}} \quad \mathbb{Q}_{3,2}^{(1,0;c)}(E_u, 2a) = -\frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z631}} \quad \mathbb{Q}_{3,1}^{(1,0;c)}(E_u, 2b) = -\frac{\sqrt{6}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z632}} \quad \mathbb{Q}_{3,2}^{(1,0;c)}(E_u, 2b) = -\frac{\sqrt{6}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z633}} \quad \mathbb{Q}_{1,1}^{(1,1;c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z634}} \quad \mathbb{Q}_{1,2}^{(1,1;c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z635}} \quad \mathbb{Q}_{1,1}^{(1,1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z636}} \quad \mathbb{Q}_{1,2}^{(1,1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z637}} \quad \mathbb{Q}_{1,1}^{(1,1;c)}(E_u, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z638}} \quad \mathbb{Q}_{1,2}^{(1,1;c)}(E_u, c) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{1u})}{2}$$

$$\boxed{\text{z639}} \quad \mathbb{G}_0^{(c)}(A_{1u}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z640}} \quad \mathbb{G}_2^{(c)}(A_{1u}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z685}} \quad \mathbb{G}_2^{(c)}(A_{1u}, b) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z686}} \quad \mathbb{G}_0^{(1,-1;c)}(A_{1u}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z687}} \quad \mathbb{G}_2^{(1,-1;c)}(A_{1u}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z688}} \quad \mathbb{G}_2^{(1,-1;c)}(A_{1u}, b) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z689}} \quad \mathbb{G}_2^{(1,-1;c)}(A_{1u}, c) = -\frac{\sqrt{21}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} - \frac{\sqrt{35}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{35}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{7}$$

$$\boxed{\text{z690}} \quad \mathbb{G}_4^{(1,-1;c)}(A_{1u}, 1) = \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z691}} \quad \mathbb{G}_4^{(1,-1;c)}(A_{1u}, 2) = -\frac{\sqrt{105}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{42} + \frac{3\sqrt{7}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{105}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{42} \\ - \frac{3\sqrt{7}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{105}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{21}$$

$$\boxed{\text{z692}} \quad \mathbb{G}_0^{(1,0;c)}(A_{1u}, a) = \frac{\sqrt{3}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z693}} \quad \mathbb{G}_0^{(1,0;c)}(A_{1u}, b) = \mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{M}_2^{(b)}(B_{1u})$$

$$\boxed{\text{z694}} \quad \mathbb{G}_2^{(1,0;c)}(A_{1u}, a) = -\frac{\sqrt{6}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z695}} \quad \mathbb{G}_2^{(1,0;c)}(A_{1u}, b) = -\frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z696}} \quad \mathbb{G}_0^{(1,1;c)}(A_{1u}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z697}} \quad \mathbb{G}_2^{(1,1;c)}(A_{1u}) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z698}} \quad \mathbb{G}_1^{(c)}(A_{2g}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z699}} \quad \mathbb{G}_1^{(c)}(A_{2g}, b) = \mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z700}} \quad \mathbb{G}_1^{(c)}(A_{2g}, c) = -\frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z701}} \quad \mathbb{G}_1^{(1,-1;c)}(A_{2g}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z702}} \quad \mathbb{G}_1^{(1,-1;c)}(A_{2g}, b) = \mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z811}} \quad \mathbb{G}_1^{(1,-1;c)}(A_{2g}, c) = -\frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z812}} \quad \mathbb{G}_3^{(1,-1;c)}(A_{2g}, a) = \mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z813}} \quad \mathbb{G}_3^{(1,-1;c)}(A_{2g}, b) = \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,2}^{(b)}(E_g)}{4} + \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,2}^{(b)}(E_g)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_{1,1}^{(b)}(E_g)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_{1,1}^{(b)}(E_g)}{4}$$

$$\boxed{\text{z814}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}, a) = \mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z815}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}, b) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z816}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}, c) = -\frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z817}} \quad \mathbb{G}_1^{(1,1;c)}(A_{2g}, a) = \mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z818}} \quad \mathbb{G}_1^{(1,1;c)}(A_{2g}, b) = -\frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{M}_{1,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z819}} \quad \mathbb{G}_4^{(1,-1;c)}(A_{2u}) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{4}$$

$$\boxed{\text{z820}} \quad \mathbb{G}_3^{(1,-1;c)}(B_{1g}) = \mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z821}} \quad \mathbb{G}_3^{(1,0;c)}(B_{1g}) = \frac{\sqrt{3}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{3} - \frac{\sqrt{3}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_2^{(b)}(B_{2g})}{3}$$

$$\boxed{\text{z822}} \quad \mathbb{G}_2^{(c)}(B_{1u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z823}} \quad \mathbb{G}_2^{(c)}(B_{1u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z824}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{1u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z825}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{1u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z826}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{1u}, c) = \frac{3\sqrt{7}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} - \frac{\sqrt{105}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{42} + \frac{3\sqrt{7}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} \\ - \frac{\sqrt{105}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{42} + \frac{\sqrt{105}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{21}$$

$$\boxed{\text{z827}} \quad \mathbb{G}_4^{(1,-1;c)}(B_{1u}) = \frac{\sqrt{35}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{35}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} - \frac{\sqrt{21}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{7}$$

$$\boxed{\text{z828}} \quad \mathbb{G}_2^{(1,0;c)}(B_{1u}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z829}} \quad \mathbb{G}_2^{(1,0;c)}(B_{1u}, b) = -\frac{\sqrt{6}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z830}} \quad \mathbb{G}_2^{(1,1;c)}(B_{1u}) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z831}} \quad \mathbb{G}_3^{(1,-1;c)}(B_{2g}) = \mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z832}} \quad \mathbb{G}_2^{(c)}(B_{2u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z833}} \quad \mathbb{G}_2^{(c)}(B_{2u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z834}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{2u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z835}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{2u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z836}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{2u}, c) = -\frac{\sqrt{7}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{7} + \frac{\sqrt{105}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{21} + \frac{\sqrt{7}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{7} \\ - \frac{\sqrt{105}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{21} + \frac{\sqrt{105}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{21}$$

$$\boxed{\text{z837}} \quad \mathbb{G}_4^{(1,-1;c)}(B_{2u}) = -\frac{\sqrt{35}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{28} - \frac{3\sqrt{21}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{28} + \frac{\sqrt{35}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{28} + \frac{3\sqrt{21}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{28} + \frac{\sqrt{21}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{7}$$

$$\boxed{\text{z838}} \quad \mathbb{G}_2^{(1,0;c)}(B_{2u}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z839}} \quad \mathbb{G}_2^{(1,0;c)}(B_{2u}, b) = -\frac{\sqrt{6}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z840}} \quad \mathbb{G}_2^{(1,1;c)}(B_{2u}) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z841}} \quad \mathbb{G}_{1,1}^{(c)}(E_g, a) = -\frac{\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{2} + \frac{\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z842}} \quad \mathbb{G}_{1,2}^{(c)}(E_g, a) = -\frac{\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{2} + \frac{\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z843}} \quad \mathbb{G}_{1,1}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z844}} \quad \mathbb{G}_{1,2}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z845}} \quad \mathbb{G}_{1,1}^{(1,-1;c)}(E_g, a) = -\frac{\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{2} + \frac{\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z846}} \quad \mathbb{G}_{1,2}^{(1,-1;c)}(E_g, a) = -\frac{\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{2} + \frac{\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z847}} \quad \mathbb{G}_{1,1}^{(1,-1;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z848}} \quad \mathbb{G}_{1,2}^{(1,-1;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z849}} \quad \mathbb{G}_{3,1}^{(1,-1;c)}(E_g, 1) = \frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z850}} \quad \mathbb{G}_{3,2}^{(1,-1;c)}(E_g, 1) = \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z851}} \quad \mathbb{G}_{3,1}^{(1,-1;c)}(E_g, 2) = \frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z852}} \quad \mathbb{G}_{3,2}^{(1,-1;c)}(E_g, 2) = \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z853}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z854}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z855}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g, b) = -\frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z856}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g, b) = -\frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{2g})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z857}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g, c) = -\frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{M}_{1,1}^{(b)}(E_g)}{5} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{M}_{1,1}^{(b)}(E_g)}{10} - \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z858}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g, c) = -\frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{M}_{1,2}^{(b)}(E_g)}{5} - \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{M}_{1,2}^{(b)}(E_g)}{10} - \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z859}} \quad \mathbb{G}_{3,1}^{(1,0;c)}(E_g, 1) = \frac{\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{M}_{1,1}^{(b)}(E_g)}{2} + \frac{\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{M}_{1,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z860}} \quad \mathbb{G}_{3,2}^{(1,0;c)}(E_g, 1) = -\frac{\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{M}_{1,2}^{(b)}(E_g)}{2} + \frac{\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{M}_{1,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z861}} \quad \mathbb{G}_{1,1}^{(1,1;c)}(E_g) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z862}} \quad \mathbb{G}_{1,2}^{(1,1;c)}(E_g) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z863}} \quad \mathbb{G}_{2,1}^{(c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z864}} \quad \mathbb{G}_{2,2}^{(c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z865}} \quad \mathbb{G}_{2,1}^{(c)}(E_u, b) = -\frac{\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z866}} \quad \mathbb{G}_{2,2}^{(c)}(E_u, b) = -\frac{\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z867}} \quad \mathbb{G}_{2,1}^{(1,-1;c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z868}} \quad \mathbb{G}_{2,2}^{(1,-1;c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z869}} \quad \mathbb{G}_{2,1}^{(1,-1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z870}} \quad \mathbb{G}_{2,2}^{(1,-1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z871}} \quad \mathbb{G}_{2,1}^{(1,-1;c)}(E_u, c) = \frac{\sqrt{14}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{14} + \frac{\sqrt{210}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{42} - \frac{\sqrt{14}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{42} - \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{42}$$

$$\boxed{\text{z872}} \quad \mathbb{G}_{2,2}^{(1,-1;c)}(E_u, c) = \frac{\sqrt{14}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{14} + \frac{\sqrt{210}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{42} + \frac{\sqrt{14}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{14} - \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{42} - \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{42}$$

$$\boxed{\text{z873}} \quad \mathbb{G}_{4,1}^{(1,-1;c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{6}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z874}} \quad \mathbb{G}_{4,2}^{(1,-1;c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{6}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z875}} \quad \mathbb{G}_{4,1}^{(1,-1;c)}(E_u, 2) = \frac{\sqrt{70}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{56} - \frac{3\sqrt{42}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{56} - \frac{\sqrt{70}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{56} + \frac{\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{3\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{56}$$

$$\boxed{\text{z876}} \quad \mathbb{G}_{4,2}^{(1,-1;c)}(E_u, 2) = \frac{\sqrt{70}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{56} - \frac{3\sqrt{42}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{56} + \frac{\sqrt{70}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{56} - \frac{\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{3\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{56}$$

$$\boxed{\text{z877}} \quad \mathbb{G}_{2,1}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z878}} \quad \mathbb{G}_{2,2}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z879}} \quad \mathbb{G}_{2,1}^{(1,0;c)}(E_u, b) = -\frac{\sqrt{3}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z880}} \quad \mathbb{G}_{2,2}^{(1,0;c)}(E_u, b) = -\frac{\sqrt{3}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z881}} \quad \mathbb{G}_{2,1}^{(1,1;c)}(E_u) = -\frac{\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z882}} \quad \mathbb{G}_{2,2}^{(1,1;c)}(E_u) = -\frac{\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

• 'Co'-'Si' bond-cluster

\* bra:  $\langle p_x, \uparrow |, \langle p_x, \downarrow |, \langle p_y, \uparrow |, \langle p_y, \downarrow |, \langle p_z, \uparrow |, \langle p_z, \downarrow |$

\* ket:  $|p_x, \uparrow \rangle, |p_x, \downarrow \rangle, |p_y, \uparrow \rangle, |p_y, \downarrow \rangle, |p_z, \uparrow \rangle, |p_z, \downarrow \rangle$

\* wyckoff: 8a@8i

$$\boxed{\text{z49}} \quad \mathbb{Q}_0^{(c)}(A_{1g}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z50}} \quad \mathbb{Q}_0^{(c)}(A_{1g}, b) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z51}} \quad \mathbb{Q}_2^{(c)}(A_{1g}, a) = \mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z52}} \quad \mathbb{Q}_2^{(c)}(A_{1g}, b) = \frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z53}} \quad \mathbb{Q}_2^{(c)}(A_{1g}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z54}} \quad \mathbb{Q}_0^{(1,-1;c)}(A_{1g}) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z55}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, a) = \mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z56}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, b) = \frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z57}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z58}} \quad \mathbb{Q}_2^{(1,-1;c)}(A_{1g}, d) = -\frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} - \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{5}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z59}} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{1g}, 1) = \frac{\sqrt{195}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{78} - \frac{\sqrt{13}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{195}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{78} - \frac{\sqrt{13}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} + \frac{5\sqrt{13}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{39}$$

$$\boxed{\text{z60}} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{1g}, 2) = -\frac{\sqrt{65}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{13} - \frac{\sqrt{65}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{13} + \frac{\sqrt{39}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{13}$$

$$\boxed{\text{z61}} \quad \mathbb{Q}_0^{(1,0;c)}(A_{1g}) = \frac{\sqrt{3}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z62}} \quad \mathbb{Q}_2^{(1,0;c)}(A_{1g}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z63}} \quad \mathbb{Q}_2^{(1,0;c)}(A_{1g}, b) = \mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z64}} \quad \mathbb{Q}_2^{(1,0;c)}(A_{1g}, c) = \frac{\sqrt{6}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z65}} \quad \mathbb{Q}_0^{(1,1;c)}(A_{1g}) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z66}} \quad \mathbb{Q}_2^{(1,1;c)}(A_{1g}) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z106}} \quad \mathbb{Q}_5^{(c)}(A_{1u}) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z107}} \quad \mathbb{Q}_5^{(1,-1;c)}(A_{1u}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z108}} \quad \mathbb{Q}_5^{(1,-1;c)}(A_{1u}, b) = \mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z109}} \quad \mathbb{Q}_4^{(c)}(A_{2g}) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_2^{(b)}(B_{1g})$$

$$\boxed{\text{z110}} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{2g}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_2^{(b)}(B_{1g})$$

$$\boxed{\text{z111}} \quad \mathbb{Q}_4^{(1,-1;c)}(A_{2g}, b) = -\frac{\sqrt{15}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{8} + \frac{3\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{8} + \frac{\sqrt{15}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} - \frac{3\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} + \frac{\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{2}$$

$$\boxed{\text{z112}} \quad \mathbb{Q}_4^{(1,0;c)}(A_{2g}) = \mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_2^{(b)}(B_{1g})$$

$$\boxed{\text{z113}} \quad \mathbb{Q}_1^{(c)}(A_{2u}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})$$

$$\boxed{\text{z114}} \quad \mathbb{Q}_1^{(c)}(A_{2u}, b) = \frac{\sqrt{30}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z115}} \quad \mathbb{Q}_1^{(c)}(A_{2u}, c) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z116}} \quad \mathbb{Q}_1^{(c)}(A_{2u}, d) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z117}} \quad \mathbb{Q}_3^{(c)}(A_{2u}) = -\frac{\sqrt{5}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{5} - \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{5} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z118}} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, a) = \frac{\sqrt{30}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z119}} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, b) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z120}} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z121}} \quad \mathbb{Q}_1^{(1,-1;c)}(A_{2u}, d) = \mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z122}} \quad \mathbb{Q}_3^{(1,-1;c)}(A_{2u}, a) = -\frac{\sqrt{5}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{5} - \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{5} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z123}} \quad \mathbb{Q}_3^{(1,-1;c)}(A_{2u}, b) = -\frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{4}$$

$$\boxed{\text{z166}} \quad \mathbb{Q}_1^{(1,0;c)}(A_{2u}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z167}} \quad \mathbb{Q}_1^{(1,0;c)}(A_{2u}, b) = \frac{\sqrt{30}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{30}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z168}} \quad \mathbb{Q}_1^{(1,0;c)}(A_{2u}, c) = \mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z169}} \quad \mathbb{Q}_3^{(1,0;c)}(A_{2u}) = -\frac{\sqrt{5}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{5} - \frac{\sqrt{5}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{5} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{5}$$

$$\boxed{\text{z170}} \quad \mathbb{Q}_1^{(1,1;c)}(A_{2u}, a) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_1^{(b)}(A_{2u})$$

$$\boxed{\text{z171}} \quad \mathbb{Q}_1^{(1,1;c)}(A_{2u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z172}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})$$

$$\boxed{\text{z173}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, b) = \mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z174}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, c) = -\frac{\sqrt{30}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} - \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z175}} \quad \mathbb{Q}_2^{(c)}(B_{1g}, d) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z176}} \quad \mathbb{Q}_4^{(c)}(B_{1g}) = \frac{\sqrt{5}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{5} - \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{5} - \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z177}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z178}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, b) = -\frac{\sqrt{30}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{30}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} - \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z179}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z180}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{1g}, d) = -\frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} + \frac{\sqrt{30}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} + \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{8} - \frac{\sqrt{30}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{8}$$

$$\boxed{\text{z181}} \quad \mathbb{Q}_4^{(1,-1;c)}(B_{1g}, a) = \frac{\sqrt{5}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{5} - \frac{\sqrt{5}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{5} - \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z182}} \quad \mathbb{Q}_4^{(1,-1;c)}(B_{1g}, b) = -\frac{\sqrt{30}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} - \frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{8} + \frac{\sqrt{30}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{8} + \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{8}$$

$$\boxed{\text{z183}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{1g}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z226}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{1g}, b) = \mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z227}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{1g}, c) = -\frac{\sqrt{30}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{30}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{10} - \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z228}} \quad \mathbb{Q}_4^{(1,0;c)}(B_{1g}) = \frac{\sqrt{5}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{5} - \frac{\sqrt{5}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{5} - \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_2^{(b)}(B_{1g})}{5}$$

$$\boxed{\text{z229}} \quad \mathbb{Q}_2^{(1,1;c)}(B_{1g}, a) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_2^{(b)}(B_{1g})$$

$$\boxed{\text{z230}} \quad \mathbb{Q}_2^{(1,1;c)}(B_{1g}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z231}} \quad \mathbb{Q}_3^{(c)}(B_{1u}, a) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z232}} \quad \mathbb{Q}_3^{(c)}(B_{1u}, b) = \mathbb{M}_1^{(a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z233}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}, a) = \frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z234}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}, b) = \mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z235}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}, c) = -\frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z236}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{1u}, d) = -\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z237}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{1u}, a) = \mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z238}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{1u}, b) = \frac{\sqrt{3}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z239}} \quad \mathbb{Q}_3^{(1,1;c)}(B_{1u}) = \mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z240}} \quad \mathbb{Q}_2^{(c)}(B_{2g}, a) = \mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z241}} \quad \mathbb{Q}_2^{(c)}(B_{2g}, b) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z242}} \quad \mathbb{Q}_2^{(c)}(B_{2g}, c) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z243}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, a) = \mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z406}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, b) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z407}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, c) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z408}} \quad \mathbb{Q}_2^{(1,-1;c)}(B_{2g}, d) = -\frac{2\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{3} - \frac{2\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{3} - \frac{\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z409}} \quad \mathbb{Q}_4^{(1,-1;c)}(B_{2g}) = -\frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{12} - \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{4} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{12} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{4} + \frac{\sqrt{5}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z410}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{2g}, a) = -\frac{\sqrt{6}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z411}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{2g}, b) = \mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z412}} \quad \mathbb{Q}_2^{(1,0;c)}(B_{2g}, c) = \frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z413}} \quad \mathbb{Q}_2^{(1,1;c)}(B_{2g}) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{6} - \frac{\sqrt{6}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z414}} \quad \mathbb{Q}_3^{(c)}(B_{2u}, a) = \mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z415}} \quad \mathbb{Q}_3^{(c)}(B_{2u}, b) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z416}} \quad \mathbb{Q}_5^{(c)}(B_{2u}) = \mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z417}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{2u}, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z418}} \quad \mathbb{Q}_3^{(1,-1;c)}(B_{2u}, b) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{12} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{3}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z419}} \quad \mathbb{Q}_5^{(1,-1;c)}(B_{2u}) = \mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z420}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{2u}, a) = -\frac{\sqrt{3}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z421}} \quad \mathbb{Q}_3^{(1,0;c)}(B_{2u}, b) = -\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z422}} \quad \mathbb{Q}_3^{(1,1;c)}(B_{2u}) = \mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_3^{(b)}(B_{2u})$$

$$\boxed{\text{z423}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z424}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z425}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z426}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z427}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, c) = -\frac{\sqrt{15}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z428}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, c) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z429}} \quad \mathbb{Q}_{2,1}^{(c)}(E_g, d) = -\frac{\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z430}} \quad \mathbb{Q}_{2,2}^{(c)}(E_g, d) = \frac{\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z431}} \quad \mathbb{Q}_{4,1}^{(c)}(E_g, 1) = -\frac{7\sqrt{235}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470} - \frac{7\sqrt{235}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z432}} \quad \mathbb{Q}_{4,2}^{(c)}(E_g, 1) = \frac{7\sqrt{235}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470} + \frac{7\sqrt{235}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z433}} \quad \mathbb{Q}_{4,1}^{(c)}(E_g, 2) = \frac{3\sqrt{47}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{47} + \frac{3\sqrt{47}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z434}} \quad \mathbb{Q}_{4,2}^{(c)}(E_g, 2) = -\frac{3\sqrt{47}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{47} - \frac{3\sqrt{47}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z435}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z436}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z437}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, b) = -\frac{\sqrt{15}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z438}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, b) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z439}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, c) = -\frac{\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z440}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, c) = \frac{\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z441}} \quad \mathbb{Q}_{2,1}^{(1,-1;c)}(E_g, d) = \frac{\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{8} - \frac{\sqrt{15}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{8} + \frac{\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z442}} \quad \mathbb{Q}_{2,2}^{(1,-1;c)}(E_g, d) = -\frac{\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{8} + \frac{\sqrt{15}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{8} - \frac{\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z443}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 1a) = -\frac{7\sqrt{235}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470} - \frac{7\sqrt{235}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z444}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 1a) = \frac{7\sqrt{235}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470} + \frac{7\sqrt{235}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z445}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 1b) = \frac{\sqrt{5055}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{2696} - \frac{47\sqrt{337}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{2696} - \frac{3\sqrt{5055}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{674} \\ - \frac{8\sqrt{337}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{337} - \frac{6\sqrt{337}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{337}$$

$$\boxed{\text{z446}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 1b) = -\frac{\sqrt{5055}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{2696} + \frac{47\sqrt{337}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{2696} + \frac{3\sqrt{5055}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{674} \\ + \frac{8\sqrt{337}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{337} - \frac{6\sqrt{337}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{337}$$

$$\boxed{\text{z447}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 2a) = \frac{3\sqrt{47}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{47} + \frac{3\sqrt{47}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z448}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 2a) = -\frac{3\sqrt{47}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{47} - \frac{3\sqrt{47}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z449}} \quad \mathbb{Q}_{4,1}^{(1,-1;c)}(E_g, 2b) = -\frac{55\sqrt{10110}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{10784} - \frac{111\sqrt{674}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{10784} \\ - \frac{7\sqrt{10110}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{5392} + \frac{75\sqrt{674}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{5392} - \frac{7\sqrt{674}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{1348}$$

$$\boxed{\text{z450}} \quad \mathbb{Q}_{4,2}^{(1,-1;c)}(E_g, 2b) = \frac{55\sqrt{10110}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{10784} + \frac{111\sqrt{674}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{10784} \\ + \frac{7\sqrt{10110}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{5392} - \frac{75\sqrt{674}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{5392} - \frac{7\sqrt{674}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{1348}$$

$$\boxed{\text{z451}} \quad \mathbb{Q}_{2,1}^{(1,0;c)}(E_g, a) = -\frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z452}} \quad \mathbb{Q}_{2,2}^{(1,0;c)}(E_g, a) = \frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z453}} \quad \mathbb{Q}_{2,1}^{(1,0;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z454}} \quad \mathbb{Q}_{2,2}^{(1,0;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z455}} \quad \mathbb{Q}_{2,1}^{(1,0;c)}(E_g, c) = -\frac{\sqrt{15}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{10} - \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z456}} \quad \mathbb{Q}_{2,2}^{(1,0;c)}(E_g, c) = \frac{\sqrt{15}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{10} + \frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{10}$$

$$\boxed{\text{z457}} \quad \mathbb{Q}_{4,1}^{(1,0;c)}(E_g, 1) = -\frac{7\sqrt{235}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{470} - \frac{7\sqrt{235}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z458}} \quad \mathbb{Q}_{4,2}^{(1,0;c)}(E_g, 1) = \frac{7\sqrt{235}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{470} - \frac{11\sqrt{705}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{470} + \frac{7\sqrt{235}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{470} - \frac{3\sqrt{235}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{470}$$

$$\boxed{\text{z459}} \quad \mathbb{Q}_{4,1}^{(1,0;c)}(E_g, 2) = \frac{3\sqrt{47}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{47} + \frac{3\sqrt{47}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z460}} \quad \mathbb{Q}_{4,2}^{(1,0;c)}(E_g, 2) = -\frac{3\sqrt{47}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{94} - \frac{\sqrt{141}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{47} - \frac{3\sqrt{47}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{94} + \frac{4\sqrt{47}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{47}$$

$$\boxed{\text{z461}} \quad \mathbb{Q}_{2,1}^{(1,1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z462}} \quad \mathbb{Q}_{2,2}^{(1,1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z463}} \quad \mathbb{Q}_{2,1}^{(1,1;c)}(E_g, b) = -\frac{\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z464}} \quad \mathbb{Q}_{2,2}^{(1,1;c)}(E_g, b) = \frac{\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z465}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z466}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z467}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, b) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z468}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, b) = \frac{\sqrt{15}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z469}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, c) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z470}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, c) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z471}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, d) = -\frac{\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z472}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, d) = -\frac{\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z473}} \quad \mathbb{Q}_{1,1}^{(c)}(E_u, e) = -\frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z474}} \quad \mathbb{Q}_{1,2}^{(c)}(E_u, e) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z475}} \quad \mathbb{Q}_{3,1}^{(c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} + \frac{3\sqrt{10}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z476}} \quad \mathbb{Q}_{3,2}^{(c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{3\sqrt{10}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z477}} \quad \mathbb{Q}_{3,1}^{(c)}(E_u, 2) = -\frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z518}} \quad \mathbb{Q}_{3,2}^{(c)}(E_u, 2) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z519}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, a) = \frac{\sqrt{15}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z520}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, a) = \frac{\sqrt{15}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} - \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z521}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, b) = \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z522}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, b) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z523}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, c) = -\frac{\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z524}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, c) = -\frac{\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z525}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, d) = -\frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z526}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, d) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z527}} \quad \mathbb{Q}_{1,1}^{(1,-1;c)}(E_u, e) = \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{2u})}{4} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{2u})}{4}$$

$$\boxed{\text{z528}} \quad \mathbb{Q}_{1,2}^{(1,-1;c)}(E_u, e) = -\frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{2u})}{4} + \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{2u})}{4}$$

$$\boxed{\text{z529}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 1a) = -\frac{\sqrt{10}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} + \frac{3\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z530}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 1a) = -\frac{\sqrt{10}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{3\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z531}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 1b) = \frac{\sqrt{6}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{10}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z532}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 1b) = \frac{\sqrt{6}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{10}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z533}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 2a) = -\frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z534}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 2a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z535}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 2b) = -\frac{\sqrt{10}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{6}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{24} + \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8} + \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{24}$$

$$\boxed{\text{z582}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 2b) = -\frac{\sqrt{10}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{6}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{24} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{24}$$

$$\boxed{\text{z583}} \quad \mathbb{Q}_{3,1}^{(1,-1;c)}(E_u, 2c) = -\frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{2u})}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{2u})}{4}$$

$$\boxed{\text{z584}} \quad \mathbb{Q}_{3,2}^{(1,-1;c)}(E_u, 2c) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{M}_2^{(b)}(B_{2u})}{4} + \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{M}_2^{(b)}(B_{2u})}{4}$$

$$\boxed{\text{z585}} \quad \mathbb{Q}_{1,1}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z586}} \quad \mathbb{Q}_{1,2}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z587}} \quad \mathbb{Q}_{1,1}^{(1,0;c)}(E_u, b) = \frac{\sqrt{15}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z588}} \quad \mathbb{Q}_{1,2}^{(1,0;c)}(E_u, b) = \frac{\sqrt{15}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{5}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10} - \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10} + \frac{\sqrt{15}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z589}} \quad \mathbb{Q}_{1,1}^{(1,0;c)}(E_u, c) = -\frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z590}} \quad \mathbb{Q}_{1,2}^{(1,0;c)}(E_u, c) = \frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z591}} \quad \mathbb{Q}_{3,1}^{(1,0;c)}(E_u, 1a) = -\frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z592}} \quad \mathbb{Q}_{3,2}^{(1,0;c)}(E_u, 1a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_3^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z593}} \quad \mathbb{Q}_{3,1}^{(1,0;c)}(E_u, 1b) = -\frac{\sqrt{10}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{20} + \frac{3\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z594}} \quad \mathbb{Q}_{3,2}^{(1,0;c)}(E_u, 1b) = -\frac{\sqrt{10}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{10} - \frac{\sqrt{30}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{20} - \frac{3\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{20} - \frac{\sqrt{10}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{10}$$

$$\boxed{\text{z595}} \quad \mathbb{Q}_{3,1}^{(1,0;c)}(E_u, 2) = -\frac{\sqrt{6}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z596}} \quad \mathbb{Q}_{3,2}^{(1,0;c)}(E_u, 2) = -\frac{\sqrt{6}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} - \frac{\sqrt{2}\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{12} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z597}} \quad \mathbb{Q}_{1,1}^{(1,1;c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z598}} \quad \mathbb{Q}_{1,2}^{(1,1;c)}(E_u, a) = \frac{\sqrt{2}\mathbb{Q}_0^{(1,1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z599}} \quad \mathbb{Q}_{1,1}^{(1,1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z641}} \quad \mathbb{Q}_{1,2}^{(1,1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z642}} \quad \mathbb{Q}_{1,1}^{(1,1;c)}(E_u, c) = -\frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z643}} \quad \mathbb{Q}_{1,2}^{(1,1;c)}(E_u, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{M}_2^{(b)}(B_{2u})}{2}$$

$$\boxed{\text{z644}} \quad \mathbb{G}_0^{(c)}(A_{1u}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z645}} \quad \mathbb{G}_2^{(c)}(A_{1u}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z646}} \quad \mathbb{G}_2^{(c)}(A_{1u}, b) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z647}} \quad \mathbb{G}_0^{(1,-1;c)}(A_{1u}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z648}} \quad \mathbb{G}_2^{(1,-1;c)}(A_{1u}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z649}} \quad \mathbb{G}_2^{(1,-1;c)}(A_{1u}, b) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z650}} \quad \mathbb{G}_2^{(1,-1;c)}(A_{1u}, c) = -\frac{\sqrt{21}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} - \frac{\sqrt{35}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{35}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{7}$$

$$\boxed{\text{z651}} \quad \mathbb{G}_4^{(1,-1;c)}(A_{1u}, 1) = \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z652}} \quad \begin{aligned} \mathbb{G}_4^{(1,-1;c)}(A_{1u}, 2) = & -\frac{\sqrt{105}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{42} + \frac{3\sqrt{7}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{105}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{42} \\ & - \frac{3\sqrt{7}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{105}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{21} \end{aligned}$$

$$\boxed{\text{z653}} \quad \mathbb{G}_0^{(1,0;c)}(A_{1u}, a) = \frac{\sqrt{3}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z654}} \quad \mathbb{G}_0^{(1,0;c)}(A_{1u}, b) = \mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{M}_2^{(b)}(B_{2u})$$

$$\boxed{\text{z655}} \quad \mathbb{G}_2^{(1,0;c)}(A_{1u}, a) = -\frac{\sqrt{6}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z656}} \quad \mathbb{G}_2^{(1,0;c)}(A_{1u}, b) = -\frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z657}} \quad \mathbb{G}_0^{(1,1;c)}(A_{1u}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{3} - \frac{\sqrt{3}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z658}} \quad \mathbb{G}_2^{(1,1;c)}(A_{1u}) = -\frac{\sqrt{6}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z703}} \quad \mathbb{G}_1^{(c)}(A_{2g}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z704}} \quad \mathbb{G}_1^{(c)}(A_{2g}, b) = \mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z705}} \quad \mathbb{G}_1^{(c)}(A_{2g}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z706}} \quad \mathbb{G}_1^{(1,-1;c)}(A_{2g}, a) = -\frac{\sqrt{2}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z707}} \quad \mathbb{G}_1^{(1,-1;c)}(A_{2g}, b) = \mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z708}} \quad \mathbb{G}_1^{(1,-1;c)}(A_{2g}, c) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z709}} \quad \begin{aligned} \mathbb{G}_1^{(1,-1;c)}(A_{2g}, d) = & -\frac{11\sqrt{237}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{632} - \frac{19\sqrt{395}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{632} + \frac{11\sqrt{237}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{632} \\ & + \frac{19\sqrt{395}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{632} + \frac{3\sqrt{395}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{158} \end{aligned}$$

$$\boxed{\text{z710}} \quad \mathbb{G}_3^{(1,-1;c)}(A_{2g}, a) = \mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z711}} \quad \begin{aligned} \mathbb{G}_3^{(1,-1;c)}(A_{2g}, b) = & -\frac{7\sqrt{395}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{316} - \frac{\sqrt{237}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{316} + \frac{7\sqrt{395}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{316} \\ & + \frac{\sqrt{237}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{316} - \frac{4\sqrt{237}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{79} \end{aligned}$$

$$\boxed{\text{z712}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}, a) = \mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z713}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}, b) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z714}} \quad \mathbb{G}_1^{(1,0;c)}(A_{2g}, c) = -\frac{\sqrt{2}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2} + \frac{\sqrt{2}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z715}} \quad \mathbb{G}_1^{(1,1;c)}(A_{2g}, a) = \mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z716}} \quad \mathbb{G}_1^{(1,1;c)}(A_{2g}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z717}} \quad \mathbb{G}_4^{(1,-1;c)}(A_{2u}) = \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{4} + \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{4} - \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{4}$$

$$\boxed{\text{z718}} \quad \mathbb{G}_3^{(1,-1;c)}(B_{1g}) = \mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z719}} \quad \mathbb{G}_2^{(c)}(B_{1u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z720}} \quad \mathbb{G}_2^{(c)}(B_{1u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z883}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{1u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z884}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{1u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z885}} \quad \begin{aligned} \mathbb{G}_2^{(1,-1;c)}(B_{1u}, c) &= \frac{3\sqrt{7}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} - \frac{\sqrt{105}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{42} + \frac{3\sqrt{7}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} \\ &\quad - \frac{\sqrt{105}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{42} + \frac{\sqrt{105}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{21} \end{aligned}$$

$$\boxed{\text{z886}} \quad \mathbb{G}_4^{(1,-1;c)}(B_{1u}) = \frac{\sqrt{35}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{\sqrt{35}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{21}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{14} - \frac{\sqrt{21}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{7}$$

$$\boxed{\text{z887}} \quad \mathbb{G}_2^{(1,0;c)}(B_{1u}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z888}} \quad \mathbb{G}_2^{(1,0;c)}(B_{1u}, b) = -\frac{\sqrt{6}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z889}} \quad \mathbb{G}_2^{(1,1;c)}(B_{1u}) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z890}} \quad \mathbb{G}_3^{(c)}(B_{2g}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z891}} \quad \mathbb{G}_3^{(1,-1;c)}(B_{2g}, a) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z892}} \quad \mathbb{G}_3^{(1,-1;c)}(B_{2g}, b) = \mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_0^{(b)}(A_{1g})$$

$$\boxed{\text{z893}} \quad \mathbb{G}_3^{(1,-1;c)}(B_{2g}, c) = \frac{\sqrt{3}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,2}^{(b)}(E_g)}{12} - \frac{\sqrt{5}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,2}^{(b)}(E_g)}{4} + \frac{\sqrt{3}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{2,1}^{(b)}(E_g)}{12} - \frac{\sqrt{5}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{2,1}^{(b)}(E_g)}{4} - \frac{\sqrt{3}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z894}} \quad \mathbb{G}_3^{(1,0;c)}(B_{2g}) = \frac{\sqrt{3}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z895}} \quad \mathbb{G}_3^{(1,1;c)}(B_{2g}) = \frac{\sqrt{3}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{2,2}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{2,1}^{(b)}(E_g)}{3} + \frac{\sqrt{3}\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_2^{(b)}(B_{1g})}{3}$$

$$\boxed{\text{z896}} \quad \mathbb{G}_2^{(c)}(B_{2u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z897}} \quad \mathbb{G}_2^{(c)}(B_{2u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z898}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{2u}, a) = -\frac{\sqrt{6}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z899}} \quad \mathbb{G}_2^{(1,-1;c)}(B_{2u}, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z900}} \quad \begin{aligned} \mathbb{G}_2^{(1,-1;c)}(B_{2u}, c) = & -\frac{\sqrt{7}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{7} + \frac{\sqrt{105}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{21} + \frac{\sqrt{7}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{7} \\ & - \frac{\sqrt{105}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{21} + \frac{\sqrt{105}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{21} \end{aligned}$$

$$\boxed{\text{z901}} \quad \mathbb{G}_4^{(1,-1;c)}(B_{2u}) = -\frac{\sqrt{35}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,2}^{(b)}(E_u)}{28} - \frac{3\sqrt{21}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,2}^{(b)}(E_u)}{28} + \frac{\sqrt{35}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_{1,1}^{(b)}(E_u)}{28} + \frac{3\sqrt{21}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_{1,1}^{(b)}(E_u)}{28} + \frac{\sqrt{21}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{7}$$

$$\boxed{\text{z902}} \quad \mathbb{G}_2^{(1,0;c)}(B_{2u}, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z903}} \quad \mathbb{G}_2^{(1,0;c)}(B_{2u}, b) = -\frac{\sqrt{6}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{6}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{6} - \frac{\sqrt{6}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_1^{(b)}(A_{2u})}{3}$$

$$\boxed{\text{z904}} \quad \mathbb{G}_2^{(1,1;c)}(B_{2u}) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z905}} \quad \mathbb{G}_{1,1}^{(c)}(E_g, a) = \frac{\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z906}} \quad \mathbb{G}_{1,2}^{(c)}(E_g, a) = -\frac{\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z907}} \quad \mathbb{G}_{1,1}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z908}} \quad \mathbb{G}_{1,2}^{(c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z909}} \quad \mathbb{G}_{1,1}^{(c)}(E_g, c) = \frac{\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z910}} \quad \mathbb{G}_{1,2}^{(c)}(E_g, c) = -\frac{\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z911}} \quad \mathbb{G}_{1,1}^{(1,-1;c)}(E_g, a) = \frac{\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z912}} \quad \mathbb{G}_{1,2}^{(1,-1;c)}(E_g, a) = -\frac{\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z913}} \quad \mathbb{G}_{1,1}^{(1,-1;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z914}} \quad \mathbb{G}_{1,2}^{(1,-1;c)}(E_g, b) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z915}} \quad \mathbb{G}_{1,1}^{(1,-1;c)}(E_g, c) = \frac{\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z916}} \quad \mathbb{G}_{1,2}^{(1,-1;c)}(E_g, c) = -\frac{\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z917}} \quad \mathbb{G}_{1,1}^{(1,-1;c)}(E_g, d) = \frac{43\sqrt{474}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{2528} - \frac{25\sqrt{790}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{2528} - \frac{21\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{1264} \\ + \frac{13\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{1264} + \frac{3\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{316}$$

$$\boxed{\text{z918}} \quad \mathbb{G}_{1,2}^{(1,-1;c)}(E_g, d) = -\frac{43\sqrt{474}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{2528} + \frac{25\sqrt{790}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{2528} + \frac{21\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{1264} \\ - \frac{13\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{1264} + \frac{3\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{316}$$

$$\boxed{\text{z919}} \quad \mathbb{G}_{3,1}^{(1,-1;c)}(E_g, 1a) = \frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z920}} \quad \mathbb{G}_{3,2}^{(1,-1;c)}(E_g, 1a) = \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z921}} \quad \mathbb{G}_{3,1}^{(1,-1;c)}(E_g, 1b) = -\frac{13\sqrt{790}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{1264} - \frac{7\sqrt{474}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{1264} - \frac{\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{632} \\ - \frac{9\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{632} + \frac{2\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{79}$$

$$\boxed{\text{z922}} \quad \mathbb{G}_{3,2}^{(1,-1;c)}(E_g, 1b) = \frac{13\sqrt{790}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_2^{(b)}(B_{1g})}{1264} + \frac{7\sqrt{474}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_2^{(b)}(B_{1g})}{1264} + \frac{\sqrt{790}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{632} \\ + \frac{9\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{632} + \frac{2\sqrt{474}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{79}$$

$$\boxed{\text{z923}} \quad \mathbb{G}_{3,1}^{(1,-1;c)}(E_g, 2) = \frac{\sqrt{2}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z924}} \quad \mathbb{G}_{3,2}^{(1,-1;c)}(E_g, 2) = \frac{\sqrt{2}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z925}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z926}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z927}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g, b) = \frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z928}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g, b) = -\frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z929}} \quad \mathbb{G}_{1,1}^{(1,0;c)}(E_g, c) = \frac{\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z930}} \quad \mathbb{G}_{1,2}^{(1,0;c)}(E_g, c) = -\frac{\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z931}} \quad \mathbb{G}_{1,1}^{(1,1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z932}} \quad \mathbb{G}_{1,2}^{(1,1;c)}(E_g, a) = \frac{\sqrt{2}\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_0^{(b)}(A_{1g})}{2}$$

$$\boxed{\text{z933}} \quad \mathbb{G}_{1,1}^{(1,1;c)}(E_g, b) = \frac{\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} + \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{2,2}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z934}} \quad \mathbb{G}_{1,2}^{(1,1;c)}(E_g, b) = -\frac{\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_2^{(b)}(B_{1g})}{2} - \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{2,1}^{(b)}(E_g)}{2}$$

$$\boxed{\text{z935}} \quad \mathbb{G}_{2,1}^{(c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,2}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z936}} \quad \mathbb{G}_{2,2}^{(c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z937}} \quad \mathbb{G}_{2,1}^{(c)}(E_u, b) = -\frac{\mathbb{M}_{1,2}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z938}} \quad \mathbb{G}_{2,2}^{(c)}(E_u, b) = -\frac{\mathbb{M}_{1,1}^{(a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z939}} \quad \mathbb{G}_{2,1}^{(1,-1;c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,2}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z940}} \quad \mathbb{G}_{2,2}^{(1,-1;c)}(E_u, a) = -\frac{\sqrt{3}\mathbb{Q}_{2,1}^{(1,-1;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{Q}_2^{(1,-1;a)}(A_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{1g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{Q}_2^{(1,-1;a)}(B_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z941}} \quad \mathbb{G}_{2,1}^{(1,-1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,2}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z942}} \quad \mathbb{G}_{2,2}^{(1,-1;c)}(E_u, b) = -\frac{\mathbb{M}_{1,1}^{(1,-1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z943}} \quad \mathbb{G}_{2,1}^{(1,-1;c)}(E_u, c) = \frac{\sqrt{14}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{14} + \frac{\sqrt{210}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{42} - \frac{\sqrt{14}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{42} - \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{42}$$

$$\boxed{\text{z944}} \quad \mathbb{G}_{2,2}^{(1,-1;c)}(E_u, c) = \frac{\sqrt{14}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{14} + \frac{\sqrt{210}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{42} + \frac{\sqrt{14}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{14} - \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{42} - \frac{\sqrt{210}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{42}$$

$$\boxed{\text{z945}} \quad \mathbb{G}_{4,1}^{(1,-1;c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{6}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z946}} \quad \mathbb{G}_{4,2}^{(1,-1;c)}(E_u, 1) = -\frac{\sqrt{10}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{8} - \frac{\sqrt{6}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{8} + \frac{\sqrt{10}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8} - \frac{\sqrt{6}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{8}$$

$$\boxed{\text{z947}} \quad \mathbb{G}_{4,1}^{(1,-1;c)}(E_u, 2) = \frac{\sqrt{70}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{56} - \frac{3\sqrt{42}\mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{56} - \frac{\sqrt{70}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{56} + \frac{\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{14} + \frac{3\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{56}$$

$$\boxed{\text{z948}} \quad \mathbb{G}_{4,2}^{(1,-1;c)}(E_u, 2) = \frac{\sqrt{70}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1)\mathbb{T}_1^{(b)}(A_{2u})}{56} - \frac{3\sqrt{42}\mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2)\mathbb{T}_1^{(b)}(A_{2u})}{56} + \frac{\sqrt{70}\mathbb{M}_3^{(1,-1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{56} - \frac{\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{14} + \frac{3\sqrt{42}\mathbb{M}_3^{(1,-1;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{56}$$

$$\boxed{\text{z949}} \quad \mathbb{G}_{2,1}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,2}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z950}} \quad \mathbb{G}_{2,2}^{(1,0;c)}(E_u, a) = -\frac{\mathbb{G}_{1,1}^{(1,0;a)}(E_g)\mathbb{Q}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{G}_1^{(1,0;a)}(A_{2g})\mathbb{Q}_{1,1}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z951}} \quad \mathbb{G}_{2,1}^{(1,0;c)}(E_u, b) = -\frac{\sqrt{3}\mathbb{T}_{2,2}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z952}} \quad \mathbb{G}_{2,2}^{(1,0;c)}(E_u, b) = -\frac{\sqrt{3}\mathbb{T}_{2,1}^{(1,0;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{6} + \frac{\mathbb{T}_2^{(1,0;a)}(A_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2} - \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{1g})\mathbb{T}_{1,2}^{(b)}(E_u)}{6} + \frac{\sqrt{3}\mathbb{T}_2^{(1,0;a)}(B_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{6}$$

$$\boxed{\text{z953}} \quad \mathbb{G}_{2,1}^{(1,1;c)}(E_u) = -\frac{\mathbb{M}_{1,2}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} + \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,2}^{(b)}(E_u)}{2}$$

$$\boxed{\text{z954}} \quad \mathbb{G}_{2,2}^{(1,1;c)}(E_u) = -\frac{\mathbb{M}_{1,1}^{(1,1;a)}(E_g)\mathbb{T}_1^{(b)}(A_{2u})}{2} - \frac{\mathbb{M}_1^{(1,1;a)}(A_{2g})\mathbb{T}_{1,1}^{(b)}(E_u)}{2}$$

- bra:  $\langle p_x, \uparrow |, \langle p_x, \downarrow |, \langle p_y, \uparrow |, \langle p_y, \downarrow |, \langle p_z, \uparrow |, \langle p_z, \downarrow |$
- ket:  $|p_x, \uparrow \rangle, |p_x, \downarrow \rangle, |p_y, \uparrow \rangle, |p_y, \downarrow \rangle, |p_z, \uparrow \rangle, |p_z, \downarrow \rangle$

$$\boxed{x1} \quad Q_0^{(a)}(A_{1g}) = \begin{bmatrix} \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} \end{bmatrix}$$

$$\boxed{x2} \quad Q_2^{(a)}(A_{1g}) = \begin{bmatrix} -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{3} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{3} \end{bmatrix}$$

$$\boxed{x3} \quad Q_2^{(a)}(B_{1g}) = \begin{bmatrix} \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & -\frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{1}{2} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{x4} \quad Q_2^{(a)}(B_{2g}) = \begin{bmatrix} 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 \\ \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{x5} \quad Q_{2,1}^{(a)}(E_g) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & \frac{1}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{1}{2} & 0 & 0 \end{bmatrix}$$

$$\boxed{\text{x6}} \quad \mathbb{Q}_{2,2}^{(a)}(E_g) = \begin{bmatrix} 0 & 0 & 0 & 0 & \frac{1}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{1}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{1}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{\text{x7}} \quad \mathbb{Q}_2^{(1,-1;a)}(A_{1g}) = \begin{bmatrix} 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & -\frac{\sqrt{6}}{12} \\ 0 & 0 & 0 & \frac{\sqrt{6}i}{6} & \frac{\sqrt{6}}{12} & 0 \\ \frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{12} \\ 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & \frac{\sqrt{6}i}{12} & 0 \\ 0 & \frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 \\ -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{\text{x8}} \quad \mathbb{Q}_2^{(1,-1;a)}(B_{1g}) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 \\ 0 & \frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{\text{x9}} \quad \mathbb{Q}_2^{(1,-1;a)}(B_{2g}) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{\text{x10}} \quad \mathbb{Q}_{2,1}^{(1,-1;a)}(E_g) = \begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & -\frac{\sqrt{2}i}{4} \\ 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{x11} \quad \mathbb{Q}_{2,2}^{(1,-1;a)}(E_g) = \begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 \\ \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \end{bmatrix}$$

$$\boxed{x12} \quad \mathbb{Q}_0^{(1,1;a)}(A_{1g}) = \begin{bmatrix} 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & 0 & 0 & \frac{\sqrt{3}i}{6} & -\frac{\sqrt{3}}{6} & 0 \\ \frac{\sqrt{3}i}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ \frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{x13} \quad \mathbb{G}_1^{(1,0;a)}(A_{2g}) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & -\frac{\sqrt{2}}{4} & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{x14} \quad \mathbb{G}_{1,1}^{(1,0;a)}(E_g) = \begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}}{4} & -\frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{2}}{4} & 0 & 0 & 0 & 0 & 0 \\ \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{x15} \quad \mathbb{G}_{1,2}^{(1,0;a)}(E_g) = \begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{2}i}{4} & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 \\ \frac{\sqrt{2}i}{4} & 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} \\ 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{2}i}{4} & 0 & 0 \end{bmatrix}$$

$$\boxed{\text{x16}} \quad \mathbb{M}_1^{(a)}(A_{2g}) = \begin{bmatrix} 0 & 0 & -\frac{i}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{i}{2} & 0 & 0 \\ \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{\text{x17}} \quad \mathbb{M}_{1,1}^{(a)}(E_g) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} \\ 0 & 0 & \frac{i}{2} & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{i}{2} & 0 & 0 \end{bmatrix}$$

$$\boxed{\text{x18}} \quad \mathbb{M}_{1,2}^{(a)}(E_g) = \begin{bmatrix} 0 & 0 & 0 & 0 & -\frac{i}{2} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{i}{2} \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{i}{2} & 0 & 0 & 0 & 0 & 0 \\ 0 & \frac{i}{2} & 0 & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{\text{x19}} \quad \mathbb{M}_1^{(1,-1;a)}(A_{2g}) = \begin{bmatrix} \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} \end{bmatrix}$$

$$\boxed{\text{x20}} \quad \mathbb{M}_3^{(1,-1;a)}(A_{2g}) = \begin{bmatrix} -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 \\ 0 & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & \frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & \frac{\sqrt{5}}{10} & -\frac{\sqrt{5}i}{10} & 0 \\ 0 & -\frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{5}i}{10} & \frac{\sqrt{5}}{5} & 0 \\ -\frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & -\frac{\sqrt{5}}{5} \end{bmatrix}$$

$$\boxed{\text{x21}} \quad \mathbb{M}_3^{(1,-1;a)}(B_{1g}) = \begin{bmatrix} 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & \frac{\sqrt{3}i}{6} & 0 \\ \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ \frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{x22} \quad \mathbb{M}_3^{(1,-1;a)}(B_{2g}) = \begin{bmatrix} \frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}i}{6} \\ 0 & 0 & 0 & \frac{\sqrt{3}}{6} & -\frac{\sqrt{3}i}{6} & 0 \\ 0 & \frac{\sqrt{3}}{6} & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 \\ \frac{\sqrt{3}}{6} & 0 & -\frac{\sqrt{3}i}{6} & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{x23} \quad \mathbb{M}_{1,1}^{(1,-1;a)}(E_g) = \begin{bmatrix} 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 \\ \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 \\ 0 & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{6} & 0 \end{bmatrix}$$

$$\boxed{x24} \quad \mathbb{M}_{1,2}^{(1,-1;a)}(E_g) = \begin{bmatrix} 0 & \frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 \\ -\frac{\sqrt{6}i}{6} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \frac{\sqrt{6}i}{6} & 0 & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{6}i}{6} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{6}i}{6} & 0 \end{bmatrix}$$

$$\boxed{x25} \quad \mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 1) = \begin{bmatrix} 0 & \frac{\sqrt{5}}{5} & 0 & \frac{\sqrt{5}i}{10} & -\frac{\sqrt{5}}{10} & 0 \\ \frac{\sqrt{5}}{5} & 0 & -\frac{\sqrt{5}i}{10} & 0 & 0 & \frac{\sqrt{5}}{10} \\ 0 & \frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 \\ -\frac{\sqrt{5}i}{10} & 0 & -\frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ -\frac{\sqrt{5}}{10} & 0 & 0 & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & \frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{5}}{10} & 0 \end{bmatrix}$$

$$\boxed{x26} \quad \mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 1) = \begin{bmatrix} 0 & -\frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 \\ \frac{\sqrt{5}i}{10} & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{5}}{10} & 0 & \frac{\sqrt{5}i}{5} & \frac{\sqrt{5}}{10} & 0 \\ \frac{\sqrt{5}}{10} & 0 & -\frac{\sqrt{5}i}{5} & 0 & 0 & -\frac{\sqrt{5}}{10} \\ 0 & 0 & \frac{\sqrt{5}}{10} & 0 & 0 & -\frac{\sqrt{5}i}{10} \\ 0 & 0 & 0 & -\frac{\sqrt{5}}{10} & \frac{\sqrt{5}i}{10} & 0 \end{bmatrix}$$

$$\boxed{x27} \quad \mathbb{M}_{3,1}^{(1,-1;a)}(E_g, 2) = \begin{bmatrix} 0 & 0 & 0 & -\frac{\sqrt{3}i}{6} & -\frac{\sqrt{3}}{6} & 0 \\ 0 & 0 & \frac{\sqrt{3}i}{6} & 0 & 0 & \frac{\sqrt{3}}{6} \\ 0 & -\frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & 0 & 0 \\ \frac{\sqrt{3}i}{6} & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & \frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{3}}{6} & 0 \end{bmatrix}$$

$$\boxed{x28} \quad \mathbb{M}_{3,2}^{(1,-1;a)}(E_g, 2) = \begin{bmatrix} 0 & \frac{\sqrt{3}i}{6} & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 \\ -\frac{\sqrt{3}i}{6} & 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{3}}{6} & 0 & 0 & \frac{\sqrt{3}}{6} & 0 \\ -\frac{\sqrt{3}}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{3}}{6} \\ 0 & 0 & \frac{\sqrt{3}}{6} & 0 & 0 & -\frac{\sqrt{3}i}{6} \\ 0 & 0 & 0 & -\frac{\sqrt{3}}{6} & \frac{\sqrt{3}i}{6} & 0 \end{bmatrix}$$

$$\boxed{x29} \quad \mathbb{M}_1^{(1,1;a)}(A_{2g}) = \begin{bmatrix} -\frac{\sqrt{30}}{30} & 0 & 0 & 0 & 0 & \frac{\sqrt{30}}{20} \\ 0 & \frac{\sqrt{30}}{30} & 0 & 0 & \frac{\sqrt{30}}{20} & 0 \\ 0 & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 & -\frac{\sqrt{30}i}{20} \\ 0 & 0 & 0 & \frac{\sqrt{30}}{30} & \frac{\sqrt{30}i}{20} & 0 \\ 0 & \frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{30}i}{20} & \frac{\sqrt{30}}{15} & 0 \\ \frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & -\frac{\sqrt{30}}{15} \end{bmatrix}$$

$$\boxed{x30} \quad \mathbb{M}_{1,1}^{(1,1;a)}(E_g) = \begin{bmatrix} 0 & \frac{\sqrt{30}}{15} & 0 & -\frac{\sqrt{30}i}{20} & \frac{\sqrt{30}}{20} & 0 \\ \frac{\sqrt{30}}{15} & 0 & \frac{\sqrt{30}i}{20} & 0 & 0 & -\frac{\sqrt{30}}{20} \\ 0 & -\frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 \\ \frac{\sqrt{30}i}{20} & 0 & -\frac{\sqrt{30}}{30} & 0 & 0 & 0 \\ \frac{\sqrt{30}}{20} & 0 & 0 & 0 & 0 & -\frac{\sqrt{30}}{30} \\ 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & -\frac{\sqrt{30}}{30} & 0 \end{bmatrix}$$

$$\boxed{x31} \quad \mathbb{M}_{1,2}^{(1,1;a)}(E_g) = \begin{bmatrix} 0 & -\frac{\sqrt{30}i}{30} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 \\ \frac{\sqrt{30}i}{30} & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & 0 \\ 0 & -\frac{\sqrt{30}}{20} & 0 & \frac{\sqrt{30}i}{15} & -\frac{\sqrt{30}}{20} & 0 \\ -\frac{\sqrt{30}}{20} & 0 & -\frac{\sqrt{30}}{15} & 0 & 0 & \frac{\sqrt{30}}{20} \\ 0 & 0 & -\frac{\sqrt{30}}{20} & 0 & 0 & -\frac{\sqrt{30}i}{30} \\ 0 & 0 & 0 & \frac{\sqrt{30}}{20} & \frac{\sqrt{30}i}{30} & 0 \end{bmatrix}$$

$$\boxed{x32} \quad \mathbb{T}_2^{(1,0;a)}(A_{1g}) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}i}{4} \\ 0 & 0 & 0 & 0 & -\frac{\sqrt{2}i}{4} & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} \\ 0 & 0 & 0 & 0 & \frac{\sqrt{2}}{4} & 0 \\ 0 & \frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 \\ -\frac{\sqrt{2}i}{4} & 0 & \frac{\sqrt{2}}{4} & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{x33} \quad \mathbb{T}_2^{(1,0;a)}(B_{1g}) = \begin{bmatrix} 0 & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}i}{12} & 0 \\ -\frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} \\ 0 & \frac{\sqrt{6}}{6} & 0 & 0 & \frac{\sqrt{6}}{12} & 0 \\ 0 & -\frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{6}}{12} & 0 & 0 \\ \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{x34} \quad \mathbb{T}_2^{(1,0;a)}(B_{2g}) = \begin{bmatrix} \frac{\sqrt{6}}{6} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{12} \\ 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 \\ 0 & 0 & -\frac{\sqrt{6}}{6} & 0 & 0 & -\frac{\sqrt{6}i}{12} \\ 0 & 0 & 0 & \frac{\sqrt{6}}{6} & \frac{\sqrt{6}i}{12} & 0 \\ 0 & -\frac{\sqrt{6}}{12} & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 \\ -\frac{\sqrt{6}}{12} & 0 & \frac{\sqrt{6}i}{12} & 0 & 0 & 0 \end{bmatrix}$$

$$\boxed{x35} \quad \mathbb{T}_{2,1}^{(1,0;a)}(E_g) = \begin{bmatrix} 0 & 0 & 0 & \frac{\sqrt{6}i}{12} & \frac{\sqrt{6}}{12} & 0 \\ 0 & 0 & -\frac{\sqrt{6}i}{12} & 0 & 0 & -\frac{\sqrt{6}}{12} \\ 0 & \frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{6}}{6} & 0 & 0 \\ -\frac{\sqrt{6}i}{12} & 0 & \frac{\sqrt{6}}{6} & 0 & 0 & 0 \\ \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & -\frac{\sqrt{6}}{6} \\ 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & -\frac{\sqrt{6}}{6} & 0 \end{bmatrix}$$

$$\boxed{x36} \quad \mathbb{T}_{2,2}^{(1,0;a)}(E_g) = \begin{bmatrix} 0 & \frac{\sqrt{6}i}{6} & 0 & \frac{\sqrt{6}}{12} & 0 & 0 \\ -\frac{\sqrt{6}i}{6} & 0 & \frac{\sqrt{6}}{12} & 0 & 0 & 0 \\ 0 & \frac{\sqrt{6}}{12} & 0 & 0 & -\frac{\sqrt{6}}{12} & 0 \\ \frac{\sqrt{6}}{12} & 0 & 0 & 0 & 0 & \frac{\sqrt{6}}{12} \\ 0 & 0 & -\frac{\sqrt{6}}{12} & 0 & 0 & -\frac{\sqrt{6}i}{6} \\ 0 & 0 & 0 & \frac{\sqrt{6}}{12} & \frac{\sqrt{6}i}{6} & 0 \end{bmatrix}$$

- Site cluster

\*\* Wyckoff: 2c

$$\boxed{y1} \quad \mathbb{Q}_0^{(s)}(A_{1g}) = \left[ \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right]$$

$$\boxed{y2} \quad \mathbb{Q}_1^{(s)}(A_{2u}) = \left[ \frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2} \right]$$

\*\* Wyckoff: 2a

$$\boxed{y3} \quad \mathbb{Q}_0^{(s)}(A_{1g}) = \left[ \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right]$$

$$\boxed{y4} \quad \mathbb{Q}_3^{(s)}(B_{2u}) = \left[ \frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2} \right]$$

- Bond cluster

\*\* Wyckoff: 8a@8i

$$\boxed{y5} \quad \mathbb{Q}_0^{(s)}(A_{1g}) = \left[ \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4} \right]$$

$$\boxed{y6} \quad \mathbb{T}_0^{(s)}(A_{1g}) = \left[ \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4} \right]$$

$$\boxed{y7} \quad \mathbb{Q}_1^{(s)}(A_{2u}) = \left[ \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4} \right]$$

$$\boxed{y8} \quad \mathbb{T}_1^{(s)}(A_{2u}) = \left[ \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4} \right]$$

$$\boxed{y9} \quad \mathbb{Q}_2^{(s)}(B_{1g}) = \left[ \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4} \right]$$

$$\boxed{\text{y10}} \quad \mathbb{T}_2^{(s)}(B_{1g}) = \left[ \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4} \right]$$

$$\boxed{\text{y11}} \quad \mathbb{M}_2^{(s)}(B_{2u}) = \left[ \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4} \right]$$

$$\boxed{\text{y12}} \quad \mathbb{Q}_3^{(s)}(B_{2u}) = \left[ \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4} \right]$$

$$\boxed{\text{y13}} \quad \mathbb{Q}_{2,1}^{(s)}(E_g) = \left[ \frac{1}{2}, -\frac{1}{2}, 0, 0, -\frac{1}{2}, \frac{1}{2}, 0, 0 \right]$$

$$\boxed{\text{y14}} \quad \mathbb{Q}_{2,2}^{(s)}(E_g) = \left[ 0, 0, -\frac{1}{2}, \frac{1}{2}, 0, 0, -\frac{1}{2}, \frac{1}{2} \right]$$

$$\boxed{\text{y15}} \quad \mathbb{T}_{2,1}^{(s)}(E_g) = \left[ \frac{i}{2}, -\frac{i}{2}, 0, 0, -\frac{i}{2}, \frac{i}{2}, 0, 0 \right]$$

$$\boxed{\text{y16}} \quad \mathbb{T}_{2,2}^{(s)}(E_g) = \left[ 0, 0, -\frac{i}{2}, \frac{i}{2}, 0, 0, -\frac{i}{2}, \frac{i}{2} \right]$$

$$\boxed{\text{y17}} \quad \mathbb{Q}_{1,1}^{(s)}(E_u) = \left[ 0, 0, -\frac{1}{2}, \frac{1}{2}, 0, 0, \frac{1}{2}, -\frac{1}{2} \right]$$

$$\boxed{\text{y18}} \quad \mathbb{Q}_{1,2}^{(s)}(E_u) = \left[ \frac{1}{2}, -\frac{1}{2}, 0, 0, \frac{1}{2}, -\frac{1}{2}, 0, 0 \right]$$

$$\boxed{\text{y19}} \quad \mathbb{T}_{1,1}^{(s)}(E_u) = \left[ 0, 0, -\frac{i}{2}, \frac{i}{2}, 0, 0, \frac{i}{2}, -\frac{i}{2} \right]$$

$$\boxed{\text{y20}} \quad \mathbb{T}_{1,2}^{(s)}(E_u) = \left[ \frac{i}{2}, -\frac{i}{2}, 0, 0, \frac{i}{2}, -\frac{i}{2}, 0, 0 \right]$$

\*\* Wyckoff: 8a@8j

$$\boxed{\text{y21}} \quad \mathbb{Q}_0^{(s)}(A_{1g}) = \left[ \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4} \right]$$

$$\boxed{\text{y22}} \quad \mathbb{T}_0^{(s)}(A_{1g}) = \left[ \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4} \right]$$

$$\boxed{\text{y23}} \quad \mathbb{Q}_1^{(s)}(A_{2u}) = \left[ \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4} \right]$$

$$\boxed{\text{y24}} \quad \mathbb{T}_1^{(s)}(A_{2u}) = \left[ \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4} \right]$$

$$\boxed{\text{y25}} \quad \mathbb{M}_2^{(s)}(B_{1u}) = \left[ \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4} \right]$$

$$\boxed{\text{y26}} \quad \mathbb{Q}_3^{(s)}(B_{1u}) = \left[ \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4} \right]$$

$$\boxed{\text{y27}} \quad \mathbb{Q}_2^{(s)}(B_{2g}) = \left[ \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4} \right]$$

$$\boxed{\text{y28}} \quad \mathbb{T}_2^{(s)}(B_{2g}) = \left[ \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4} \right]$$

$$\boxed{\text{y29}} \quad \mathbb{M}_{1,1}^{(s)}(E_g) = \left[ \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4} \right]$$

$$\boxed{\text{y30}} \quad \mathbb{M}_{1,2}^{(s)}(E_g) = \left[ \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4} \right]$$

$$\boxed{\text{y31}} \quad \mathbb{Q}_{2,1}^{(s)}(E_g) = \left[ \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4} \right]$$

$$\boxed{\text{y32}} \quad \mathbb{Q}_{2,2}^{(s)}(E_g) = \left[ \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4} \right]$$

$$\boxed{\text{y33}} \quad \mathbb{Q}_{1,1}^{(s)}(E_u) = \left[ \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4} \right]$$

$$\boxed{\text{y34}} \quad \mathbb{Q}_{1,2}^{(s)}(E_u) = \left[ \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4}, \frac{\sqrt{2}}{4}, -\frac{\sqrt{2}}{4} \right]$$

$$\boxed{\text{y35}} \quad \mathbb{T}_{1,1}^{(s)}(E_u) = \left[ \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4} \right]$$

$$\boxed{y36} \quad \mathbb{T}_{1,2}^{(s)}(E_u) = \left[ \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4}, \frac{\sqrt{2}i}{4}, -\frac{\sqrt{2}i}{4} \right]$$

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**Site and Bond**


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Table 5: Orbital of each site

| # | site | orbital  |
|---|------|--|
| 1 | Ce   | $ p_x, \uparrow\rangle,  p_x, \downarrow\rangle,  p_y, \uparrow\rangle,  p_y, \downarrow\rangle,  p_z, \uparrow\rangle,  p_z, \downarrow\rangle$ |
| 2 | Co   | $ p_x, \uparrow\rangle,  p_x, \downarrow\rangle,  p_y, \uparrow\rangle,  p_y, \downarrow\rangle,  p_z, \uparrow\rangle,  p_z, \downarrow\rangle$ |
| 3 | Si   | $ p_x, \uparrow\rangle,  p_x, \downarrow\rangle,  p_y, \uparrow\rangle,  p_y, \downarrow\rangle,  p_z, \uparrow\rangle,  p_z, \downarrow\rangle$ |

Table 6: Neighbor and bra-ket of each bond

| # | head | tail | neighbor | head (bra) | tail (ket) |
|---|------|------|----------|------------|------------|
| 1 | Ce   | Co   | [1]      | [p]        | [p]        |
| 2 | Ce   | Si   | [1]      | [p]        | [p]        |
| 3 | Co   | Si   | [1]      | [p]        | [p]        |

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**Site in Unit Cell**


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Sites in (conventional) cell (no plus set), SL = sublattice

Table 7: 'Ce' (#1) site cluster (2c), 4mm

| SL | position ( $s$ )             | mapping               |
|----|------------------------------|-----------------------|
| 1  | [ 0.25000, 0.25000, 0.67800] | [1,2,3,4,13,14,15,16] |
| 2  | [ 0.75000, 0.75000, 0.32200] | [5,6,7,8,9,10,11,12]  |

Table 8: 'Co' (#2) site cluster (2a), -4m2

| SL | position ( $s$ )             | mapping               |
|----|------------------------------|-----------------------|
| 1  | [ 0.75000, 0.25000, 0.00000] | [1,2,7,8,11,12,13,14] |
| 2  | [ 0.25000, 0.75000, 0.00000] | [3,4,5,6,9,10,15,16]  |

Table 9: 'Si' (#3) site cluster (2c), 4mm

| SL | position ( $s$ )             | mapping               |
|----|------------------------------|-----------------------|
| 1  | [ 0.25000, 0.25000, 0.17800] | [1,2,3,4,13,14,15,16] |
| 2  | [ 0.75000, 0.75000, 0.82200] | [5,6,7,8,9,10,11,12]  |

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## Bond in Unit Cell

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Bonds in (conventional) cell (no plus set): tail, head = (SL, plus set), (N)D = (non)directional (listed up to 5th neighbor at most)

Table 10: 1-th 'Ce'-'Co' [1] (#1) bond cluster (8a@8i), D,  $|\mathbf{v}|=3.02927$  (cartesian)

| SL | vector ( $\mathbf{v}$ )        | center ( $\mathbf{c}$ )      | mapping | head  | tail  | $\mathbf{R}$ (primitive) |
|----|--------------------------------|------------------------------|---------|-------|-------|--------------------------|
| 1  | [ 0.00000, 0.50000, -0.32200]  | [ 0.25000, 0.00000, 0.83900] | [1,14]  | (1,1) | (2,1) | [0,-1,1]                 |
| 2  | [ 0.00000, -0.50000, -0.32200] | [ 0.25000, 0.50000, 0.83900] | [2,13]  | (1,1) | (2,1) | [0,0,1]                  |
| 3  | [-0.50000, 0.00000, -0.32200]  | [ 0.50000, 0.25000, 0.83900] | [3,15]  | (1,1) | (1,1) | [0,0,1]                  |
| 4  | [ 0.50000, 0.00000, -0.32200]  | [ 0.00000, 0.25000, 0.83900] | [4,16]  | (1,1) | (1,1) | [-1,0,1]                 |
| 5  | [ 0.00000, 0.50000, 0.32200]   | [ 0.75000, 0.50000, 0.16100] | [5,10]  | (2,1) | (1,1) | [0,0,0]                  |
| 6  | [ 0.00000, -0.50000, 0.32200]  | [ 0.75000, 0.00000, 0.16100] | [6,9]   | (2,1) | (1,1) | [0,1,0]                  |
| 7  | [ 0.50000, 0.00000, 0.32200]   | [ 0.50000, 0.75000, 0.16100] | [7,11]  | (2,1) | (2,1) | [0,0,0]                  |
| 8  | [-0.50000, 0.00000, 0.32200]   | [ 0.00000, 0.75000, 0.16100] | [8,12]  | (2,1) | (2,1) | [1,0,0]                  |

Table 11: 1-th 'Ce'-'Si' [1] (#2) bond cluster (8a@8j), D,  $|\mathbf{v}|=3.04005$  (cartesian)

| SL | vector ( $\mathbf{v}$ )       | center ( $\mathbf{c}$ )      | mapping | head  | tail  | $\mathbf{R}$ (primitive) |
|----|-------------------------------|------------------------------|---------|-------|-------|--------------------------|
| 1  | [-0.50000, -0.50000, 0.14400] | [ 0.00000, 0.00000, 0.25000] | [1,16]  | (2,1) | (1,1) | [1,1,0]                  |
| 2  | [ 0.50000, 0.50000, 0.14400]  | [ 0.50000, 0.50000, 0.25000] | [2,15]  | (2,1) | (1,1) | [0,0,0]                  |

*continued ...*

Table 11

| SL | vector ( $\mathbf{v}$ )        | center ( $\mathbf{c}$ )      | mapping | head  | tail  | $\mathbf{R}$ (primitive) |
|----|--------------------------------|------------------------------|---------|-------|-------|--------------------------|
| 3  | [ 0.50000, -0.50000, 0.14400]  | [ 0.50000, 0.00000, 0.25000] | [3,14]  | (2,1) | (1,1) | [0,1,0]                  |
| 4  | [-0.50000, 0.50000, 0.14400]   | [ 0.00000, 0.50000, 0.25000] | [4,13]  | (2,1) | (1,1) | [1,0,0]                  |
| 5  | [ 0.50000, -0.50000, -0.14400] | [ 0.00000, 0.50000, 0.75000] | [5,12]  | (1,1) | (2,1) | [-1,0,0]                 |
| 6  | [-0.50000, 0.50000, -0.14400]  | [ 0.50000, 0.00000, 0.75000] | [6,11]  | (1,1) | (2,1) | [0,-1,0]                 |
| 7  | [-0.50000, -0.50000, -0.14400] | [ 0.50000, 0.50000, 0.75000] | [7,10]  | (1,1) | (2,1) | [0,0,0]                  |
| 8  | [ 0.50000, 0.50000, -0.14400]  | [ 0.00000, 0.00000, 0.75000] | [8,9]   | (1,1) | (2,1) | [-1,-1,0]                |

Table 12: 1-th 'Co'-'Si' [1] (#3) bond cluster (8a@8i), D,  $|\mathbf{v}|=2.3794$  (cartesian)

| SL | vector ( $\mathbf{v}$ )        | center ( $\mathbf{c}$ )      | mapping | head  | tail  | $\mathbf{R}$ (primitive) |
|----|--------------------------------|------------------------------|---------|-------|-------|--------------------------|
| 1  | [ 0.00000, 0.50000, -0.17800]  | [ 0.25000, 0.50000, 0.08900] | [1,14]  | (2,1) | (1,1) | [0,0,0]                  |
| 2  | [ 0.00000, -0.50000, -0.17800] | [ 0.25000, 0.00000, 0.08900] | [2,13]  | (2,1) | (1,1) | [0,1,0]                  |
| 3  | [-0.50000, 0.00000, -0.17800]  | [ 0.00000, 0.25000, 0.08900] | [3,15]  | (1,1) | (1,1) | [1,0,0]                  |
| 4  | [ 0.50000, 0.00000, -0.17800]  | [ 0.50000, 0.25000, 0.08900] | [4,16]  | (1,1) | (1,1) | [0,0,0]                  |
| 5  | [ 0.00000, 0.50000, 0.17800]   | [ 0.75000, 0.00000, 0.91100] | [5,10]  | (1,1) | (2,1) | [0,-1,-1]                |
| 6  | [ 0.00000, -0.50000, 0.17800]  | [ 0.75000, 0.50000, 0.91100] | [6,9]   | (1,1) | (2,1) | [0,0,-1]                 |
| 7  | [ 0.50000, 0.00000, 0.17800]   | [ 0.00000, 0.75000, 0.91100] | [7,11]  | (2,1) | (2,1) | [-1,0,-1]                |
| 8  | [-0.50000, 0.00000, 0.17800]   | [ 0.50000, 0.75000, 0.91100] | [8,12]  | (2,1) | (2,1) | [0,0,-1]                 |

