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The Rational valued characters table of the group ($Q_{2n}\times C_7$) when n is an odd number

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Abstract : *The main purpose of this paper is to find the rational valued characters table of the group($Q_{2n}\times C_7$) when n is an odd number, which is denoted by $\equiv^*(Q_{2n}\times C_7)$, where Q_{2n} is denoted to Quaternion group of order 4n, such that for each positive integer n, there are two generators x and y for Q_{2n} satisfies $Q_{2n}=\{x^h y^k, 0\leq h \leq 2n-1, k=0,1\}$which has the following properties$\{x^{2n}=y^4=I, yx^ny^{-1}=x^{-n}\}$*

Keywords: Rational, characters table, group , $Q_{2n}\times C_7$, odd number.

1.Introduction :

The set of all nxn non –singular matrices over the field F forms a group under the operation of matrix multiplication.This group is called the general linear group of the dimension n over the field F, denoted by GL(n,F)[3].

Let F be a field and G be a group .A matrix representation of G is a homomorphism T:G →GL(n,F), n is called the degree of representation T. T is called a unit representation (principal) T(g)=1 for all g∈G [3].

Let T be a matrix representation of G over the field F.The character χ of a matrix representation T is the mapping χ: G →F defined by $\chi(g)$ = tr(T(g)), for all g ∈G. The degree of T is called th degree of χ.Recall that the trace of an nxn matrix A is the sum of main diagonal elements.i.e tr(A)=$\sum_{i=1}^{n} a_{ii}$ [9].

Let G be a finite group ,two elements of G are said to be Γ-conjugate if the cyclic subgroups they generate are conjugate in G and this defines an equivalence relation on G and its classes are called Γ-classes [2].

In 1980, M.S. Kirdar [6] studied "The rational valued characters table of the cyclic group C_n".

In 1995, N.R. Mahamood [7] studied"The rational valued characters of Q_{2n}.

In this work we find the characters table of the group ($Q_{2n}\times C_7$) and the rational valued characters table of the group $Q_{2n}\times C_7$ when n is an odd number.

2.Preliminaries

In this section we find the rational characters table of the group Q_{2n} when n is a prime number and the rational characters table of the group C_7 .

2.1 The characters Table of the Quaternion Group Q_{2n} when n is a prime number [7]:

There are two types of irreducible characters of Q_{2n} one of them is the characters of linear representation R_1, R_2, R_3 and R_4 which are denoted by λ_1 , λ_2 , λ_3 and λ_4 respectively as in the following table :

	x^k	$x^k y$
λ_1	1	1
λ_2	1	-1
λ_3	$(-1)^k$	$i(-1)^k$
λ_4	$(-1)^k$	$i(-1)^{k+1}$

Table(1)

The characters of irreducible representations T_h of degree 2 are denoted by μ_h such that:

$\mu_h(x^k) = \upsilon^{hk} + \upsilon^{-hk} = e^{2\pi ihk/2n} + e^{-2\pi ihk/2n} = 2\cos(\pi hk/n)$

Where $0 \leq k \leq 2n-1$. $\mu h(xky) = 0$, When $0 \leq k \leq 2n-1$, $1 \leq h \leq n-1$ and $\upsilon = e^{(2\pi i/2n)}$

So there are p+3 irreducible characters of Q_{2n}. Then , the general form of the characters table of Q_{2n} when p is a prime number is given in the following table:

$\equiv(Q_{2n})$=

CL_α	[I]	$[x^2]$	$[x^4]$	⋯	$[x^{n-1}]$	$[x^n]$	[x]	$[x^3]$	⋯	$[x^{n-2}]$	[y]	[xy]
$\|CL_\alpha\|$	1	2	2	⋯	2	1	2	2	⋯	2	n	n

$\lvert C_{Q_{2n}}(CL\alpha)\rvert$	4n	2n	2n	⋯	2n	4n	2n	2n	⋯	2n	4	4
λ_1	1	1	1	⋯	1	1	1	1	⋯	1	1	1
μ_2	2	$\upsilon^4+\upsilon^{2n-4}$	$\upsilon^8+\upsilon^{2n-8}$	⋯	$\upsilon^{2(n-1)}+\upsilon^2$	2	$\upsilon^2+\upsilon^{2(n-1)}$	$\upsilon^6+\upsilon^{2n-6}$	⋯	$\upsilon^{2(n-2)}+\upsilon^4$	0	0
⋮	⋮	⋮	⋮	⋱	⋮	⋮	⋮	⋮	⋱	⋮	⋮	⋮
μ_{n-1}	2	$\upsilon^{2(n-1)}+\upsilon^2$	$\upsilon^{4(n-1)}+\upsilon^4$	⋯	$\upsilon^{n+1}+\upsilon^{n-1}$	2	$\upsilon^{n-1}+\upsilon^{n+1}$	$\upsilon^{n-3}+\upsilon^{n+3}$	⋯	$\upsilon^2+\upsilon^{2(n-1)}$	0	0
λ_2	1	1	1	⋯	1	1	1	1	⋯	1	-1	-1
μ_1	2	$\upsilon^2+\upsilon^{2(n-1)}$	$\upsilon^4+\upsilon^{4(m-1)}$	⋯	$\upsilon^{n-1}+\upsilon^{n+1}$	-2	$\upsilon+\upsilon^{2n-1}$	$\upsilon^3+\upsilon^{2n-3}$	⋯	$\upsilon^{n-2}+\upsilon^{n+2}$	0	0
⋮	⋮	⋮	⋮	⋱	⋮	⋮	⋮	⋮	⋱	⋮	⋮	⋮
μ_{n-2}	2	$\upsilon^{2n-4}+\upsilon^4$	$\upsilon^{2n-8}+\upsilon^8$	⋯	$\upsilon^2+\upsilon^{2(n-1)}$	-2	$\upsilon^{n-2}+\upsilon^{n+2}$	$\upsilon^{n-6}+\upsilon^{n+6}$	⋯	$\upsilon^{(n-2)^2}+\upsilon^{n^2-4}$	0	0
λ_3	1	1	1	⋯	1	-1	-1	-1	⋯	-1	i	-i
λ_4	1	1	1	⋯	1	-1	-1	-1	⋯	-1	-i	i

Table(2)

The characters table of matrix from degree(n+3)×(n+3)where $\upsilon=e^{2\pi i/2n}$, $\upsilon^n = -1$

The Characters Table of finite abelian groups(2.1.1):[1]

≡(C_n)=

CL_α	1	X	X^2	⋯	X^{n-1}
$\lvert CL_\alpha\rvert$	1	1	1	⋯	1
λ_1	1	1	1	⋯	1
λ_2	1	ε	ε^2	⋯	ε^{n-1}
λ_3	1	ε^2	ε^4	⋯	ε^{n-2}
⋮	⋮	⋮	⋮	⋱	⋮
λ_n	1	ε^{n-1}	ε^{n-2}	⋯	ε

Table(3)

Then ≡(C_7)=

CL_α	1	X	X^2	X^3	X^4	X^5	X^6
$\lvert CL_\alpha\rvert$	1	1	1	1	1	1	1
λ_1	1	1	1	1	1	1	1
λ_2	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6
λ_3	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5
λ_4	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4
λ_5	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3
λ_6	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2
λ_7	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε

Table(4)

Theorem(2.1.2):[9]
1-Sum of characters is a character.
2-Product of characters is a character.

3.1The Rational valued characters table:

Definition(3.1.1):[9]
The group generated by all characters on C is called the group of the generalized characters of G, and it is denoted by R(G).

Definition(3.1.2):[9]
The intersection of cf(G,Z) with R(G) forms an abelian group is called the group of Z-valued generalized characters of G, denoted by $\bar{R}$(G).

Definition(3.1.3): [7]
A rational valued character θ of G is a character whose values are in Z,which is θ(g)∈Z for all g∈ G.

Corollary (3.1.4): [7]
The rational valued characters $\rho_i = \sum_{\sigma\epsilon Gal(Q(\lambda_i)/Q)} \sigma(\lambda_i)$Form a basis for $\bar{R}(G)$,whereλ_i are the irreducible characters of G and their numbers are equal to the number of conjugacy classes of a cyclic subgroup of G.

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Proposition(3.1.5): [6]

The number of all rational valued characters of finite G is equal to the number of all distinct Γ-classis.

The rational character table of Q_{2p}, when p is a prime number(3.1.6): [8]

$\equiv^*(Q_{2p})$

Γ-classes	[1]	[x^2]	[x^p]	[x]	[y]
ρ_1	1	1	1	1	1
ρ_2	p-1	-1	p-1	-1	0
ρ_3	1	1	1	1	-1
ρ_4	p-1	-1	1-p	1	0
ρ_5	2	2	-2	-2	0

Table(5)

Proposition(3.1.7):[6]

The rational valued characters table of the cyclic group C_{p^s} of the rank s+1 where p is a prime number, which is denoted by ($\equiv^*(C_{p^s})$), and given as follows:

$\equiv^*(C_{p^s})$ =

Γ-classes	[1]	[$x^{p^{s-1}}$]	[$x^{p^{s-2}}$]	[$x^{p^{s-3}}$]	⋯	[x^{p^2}]	[x^p]	[x]
θ_1	$P^{s-1}(p-1)$	$-p^{s-1}$	0	0	⋯	0	0	0
θ_2	$P^{s-2}(p-1)$	$P^{s-2}(p-1)$	$-p^{s-2}$	0	⋯	0	0	0
θ_3	$P^{s-3}(p-1)$	$P^{s-3}(p-1)$	$P^{s-3}(p-1)$	$-p^{s-3}$	⋯	0	0	0
⋮	⋮	⋮	⋮	⋮	⋱	⋮	⋮	⋮
θ_{s-1}	P(p-1)	P(p-1)	P(p-1)	P(p-1)	⋯	P(p-1)	-p	0
θ_s	p-1	p-1	p-1	p-1	⋯	p-1	p-1	-1
θ_{s+1}	1	1	1	1	⋯	1	1	1

Table(6)

Where its rank s+1 which represents the number of all distinct Γ-classes.

4 .The Main Results

4.1 Characters Table of the Group ($Q_{2n}\times C_7$) when n is a prime number:

The group ($Q_{2n}\times C_7$) is the direct product of the Quaternion group Q_{2n} of order 4n and the cyclic group C_7 of order 7 then the order of the group ($Q_{2n}\times C_7$) is 28n , According to proposition(2.1.2) each irreducible character λ_i of Q_{2p} , defines seven characters $\lambda_{(i,1)}$, $\lambda_{(i,2)}$, $\lambda_{(i,3)}$, $\lambda_{(i,4)}$, $\lambda_{(i,5)}$, , $\lambda_{(i,6)}$, , $\lambda_{(i,7)}$. such that $\lambda_{(i,1)} = \lambda_i \lambda_1'$, $\lambda_{(i,2)} = \lambda_i \lambda_2'$, $\lambda_{(i,3)} = \lambda_i \lambda_3'$, $\lambda_{(i,4)} = \lambda_i \lambda_4'$, $\lambda_{(i,5)} = \lambda_i \lambda_5'$, $\lambda_{(i,6)} = \lambda_i \lambda_6'$, $\lambda_{(i,7)} = \lambda_i \lambda_7'$ of ($Q_{2n}\times C_7$)

Then $\equiv(Q_{2n}\times C_7) = \equiv Q_{2n} \otimes \equiv C_7$.

Then , the general form of the characters table of ($Q_{2n}\times C_7$) when n is a prime number is given in the following table:

$\equiv(Q_{2n}\times C_7)$ =

CL_α	$[I,1]$	$[I,x]$	$[I,x^2]$	$[I,x^3]$	$[I,x^4]$	$[I,x^5]$	$[I,x^6]$	$[s^2,1]$	$[s^2,x]$	$[s^2,x^2]$	$[s^2,x^3]$	$[s^2,x^4]$	$[s^2,x^5]$	$[s^2,x^6]$
$\lvert CL_\alpha\rvert$	1	1	1	1	1	1	1	2	2	2	2	2	2	2
$\lvert C_{Q_{2n}\times c_7}(CL\alpha)\rvert$	28n	28n	28n	28n	28n	28n	28n	14n	14n	14n	14n	14n	14n	14n
$\lambda_{(1,1)}$	1	1	1	1	1	1	1	1	1	1	1	1	1	1
$\lambda_{(1,2)}$	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6
$\lambda_{(1,3)}$	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5
$\lambda_{(1,4)}$	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4
$\lambda_{(1,5)}$	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3
$\lambda_{(1,6)}$	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2
$\lambda_{(1,7)}$	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1
$\mu_{(2,1)}$	2	2	2	2	2	2	2	$\upsilon^4+\upsilon^{2n-4}$	$\upsilon^4+\upsilon^{2n-4}$	$\upsilon^4+\upsilon^{2m-4}$	$\upsilon^4+\upsilon^{2n-4}$	$\upsilon^4+\upsilon^{2n-4}$	$\upsilon^4+\upsilon^{2n-4}$	$\upsilon^4+\upsilon^{2n-4}$
$\mu_{(2,2)}$	2	2ε	$2\varepsilon^2$	$2\varepsilon^3$	$2\varepsilon^4$	$2\varepsilon^5$	$2\varepsilon^6$	$\upsilon^4+\upsilon^{2n-4}$	$\varepsilon(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^2(\upsilon^4+\upsilon^{2m-4})$	$\varepsilon^3(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^4(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^5(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^6(\upsilon^4+\upsilon^{2n-4})$
$\mu_{(2,3)}$	2	$2\varepsilon^2$	$2\varepsilon^4$	$2\varepsilon^6$	2ε	$2\varepsilon^3$	$2\varepsilon^5$	$\upsilon^4+\upsilon^{2n-4}$	$\varepsilon^2(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^4(\upsilon^4+\upsilon^{2m-4})$	$\varepsilon^6(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^3(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^5(\upsilon^4+\upsilon^{2n-4})$
$\mu_{(2,4)}$	2	$2\varepsilon^3$	$2\varepsilon^6$	$2\varepsilon^2$	$2\varepsilon^5$	2ε	$2\varepsilon^4$	$\upsilon^4+\upsilon^{2n-4}$	$\varepsilon^3(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^6(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^2(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^5(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^4(\upsilon^4+\upsilon^{2n-4})$
$\mu_{(2,5)}$	2	$2\varepsilon^4$	2ε	$2\varepsilon^5$	$2\varepsilon^2$	$2\varepsilon^6$	$2\varepsilon^3$	$(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^4(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^5(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^2(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^6(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^3(\upsilon^4+\upsilon^{2n-4})$
$\mu_{(2,6)}$	2	$2\varepsilon^5$	$2\varepsilon^3$	2ε	$2\varepsilon^6$	$2\varepsilon^4$	$2\varepsilon^2$	$\upsilon^4+\upsilon^{2n-4}$	$\varepsilon^5(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^3(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^6(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^4(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^2(\upsilon^4+\upsilon^{2n-4})$
$\mu_{(2,7)}$	2	$2\varepsilon^6$	$2\varepsilon^5$	$2\varepsilon^4$	$2\varepsilon^3$	$2\varepsilon^2$	$2\varepsilon^1$	$\upsilon^4+\upsilon^{2n-4}$	$\varepsilon^6(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^5(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^4(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^3(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^2(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon(\upsilon^4+\upsilon^{2n-4})$
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
$\mu_{((n-1),1)}$	2	2	2	2	2	2	2	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$
$\mu_{((n-1),2)}$	2	2ε	$2\varepsilon^2$	$2\varepsilon^3$	$2\varepsilon^4$	$2\varepsilon^5$	$2\varepsilon^6$	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$
$\mu_{((n-1),3)}$	2	$2\varepsilon^2$	$2\varepsilon^4$	$2\varepsilon^6$	2ε	$2\varepsilon^3$	$2\varepsilon^5$	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$
$\mu_{((n-1),4)}$	2	$2\varepsilon^3$	$2\varepsilon^6$	$2\varepsilon^2$	$2\varepsilon^5$	2ε	$2\varepsilon^4$	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$
$\mu_{((n-1),5)}$	2	$2\varepsilon^4$	2ε	$2\varepsilon^5$	$2\varepsilon^2$	$2\varepsilon^6$	$2\varepsilon^3$	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$
$\mu_{((n-1),6)}$	2	$2\varepsilon^5$	$2\varepsilon^3$	2ε	$2\varepsilon^6$	$2\varepsilon^4$	$2\varepsilon^2$	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$
$\mu_{((n-1),7)}$	2	$2\varepsilon^6$	$2\varepsilon^5$	$2\varepsilon^4$	$2\varepsilon^3$	$2\varepsilon^2$	$2\varepsilon^1$	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$
$\lambda_{(2,1)}$	1	1	1	1	1	1	1	1	1	1	1	1	1	1
$\lambda_{(2,2)}$	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6

CL_α	⋯	$[s^{n-1},1]$	$[s^{n-1},x]$	$[s^{n-1},x^2]$	$[s^{n-1},x^3]$	$[s^{n-1},x^4]$	$[s^{n-1},x^5]$	$[s^{n-1},x^6]$
$\lvert CL_\alpha\rvert$	⋯	2	2	2	2	2	2	2
$\lvert C_{Q_{2n}\times c_7}(CL\alpha)\rvert$	⋯	14n	14n	14n	14n	14n	14n	14n
$\lambda_{(1,1)}$	⋯	1	1	1	1	1	1	1
$\lambda_{(1,2)}$	⋯	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6
$\lambda_{(1,3)}$	⋯	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5
$\lambda_{(1,4)}$	⋯	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4
$\lambda_{(1,5)}$	⋯	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3
$\lambda_{(1,6)}$	⋯	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2
$\lambda_{(1,7)}$	⋯	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1
$\mu_{(2,1)}$	⋯	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$	$\upsilon^{2n-2}+\upsilon^2$
$\mu_{(2,2)}$	⋯	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$
$\mu_{(2,3)}$	⋯	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$
$\mu_{(2,4)}$	⋯	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$
$\mu_{(2,5)}$	⋯	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$
$\mu_{(2,6)}$	⋯	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$
$\mu_{(2,7)}$	⋯	$\upsilon^{2n-2}+\upsilon^2$	$\varepsilon^6(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon^2(\upsilon^{2n-2}+\upsilon^2)$	$\varepsilon(\upsilon^{2n-2}+\upsilon^2)$
⋮	⋱	⋮	⋮	⋮	⋮	⋮	⋮	⋮
$\mu_{((n-1),1)}$	⋯	$\upsilon^{n+1}+\upsilon^{n-1}$	$\upsilon^{n+1}+\upsilon^{n-1}$	$\upsilon^{n+1}+\upsilon^{n-1}$	$\upsilon^{n+1}+\upsilon^{n-1}$	$\upsilon^{n+1}+\upsilon^{n-1}$	$\upsilon^{n+1}+\upsilon^{n-1}$	$\upsilon^{n+1}+\upsilon^{n-1}$
$\mu_{((n-1),2)}$	⋯	$\upsilon^{n+1}+\upsilon^{n-1}$	$\varepsilon(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^2(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^3(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^4(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^5(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^6(\upsilon^{n+1}+\upsilon^{n-1})$
$\mu_{((n-1),3)}$	⋯	$\upsilon^{n+1}+\upsilon^{n-1}$	$\varepsilon^2(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^4(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^6(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^3(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^5(\upsilon^{n+12}+\upsilon^{n-1})$
$\mu_{((n-1),4)}$	⋯	$\upsilon^{n+1}+\upsilon^{n-1}$	$\varepsilon^3(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^6(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^2(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^5(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^4(\upsilon^{n+1}+\upsilon^{n-1})$
$\mu_{((n-1),5)}$	⋯	$\upsilon^{n+1}+\upsilon^{n-1}$	$\varepsilon^4(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^5(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^2(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^6(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^3(\upsilon^{n+1}+\upsilon^{n-1})$
$\mu_{((n-1),6)}$	⋯	$\upsilon^{n+1}+\upsilon^{n-1}$	$\varepsilon^5(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^3(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^6(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^4(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^2(\upsilon^{n+1}+\upsilon^{n-1})$
$\mu_{((n-1),7)}$	⋯	$\upsilon^{n+1}+\upsilon^{n-1}$	$\varepsilon^6(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^5(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^4(\upsilon^{n+1}+\upsilon^2)$	$\varepsilon^3(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^2(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon(\upsilon^{n+1}+\upsilon^{n-1})$
$\lambda_{(2,1)}$	⋯	1	1	1	1	1	1	1
$\lambda_{(2,2)}$	⋯	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6

$\lambda_{(2,3)}$	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5	⋯	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5
$\lambda_{(2,4)}$	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4	⋯	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4
$\lambda_{(2,5)}$	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3	⋯	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3
$\lambda_{(2,6)}$	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2	⋯	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2
$\lambda_{(2,7)}$	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε	⋯	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε

$\equiv(Q_{2n}\times C_7)$ =

$[s^n,1]$	$[s^n,x]$	$[s^n,x^2]$	$[s^n,x^3]$	$[s^n,x^4]$	$[s^n,x^5]$	$[s^n,x^6]$	$[s,1]$	$[s,x]$	$[s,x^2]$	$[s,x^3]$	$[s,x^4]$	$[s,x^5]$	$[s,x^6]$	⋯	$[s^{n-2},1]$	$[s^{n-2},x]$	$[s^{n-2},x^2]$	$[s^{n-2},x^3]$	$[s^{n-2},x^4]$
1	1	1	1	1	1	1	2	2	2	2	2	2	2	⋯	2	2	2	2	2
28n	28n	28n	28n	28n	28n	28n	14n	14n	14n	14n	14n	14n	14n	⋯	14n	14n	14n	14n	14n
1	1	1	1	1	1	1	1	1	1	1	1	1	1	⋯	1	1	1	1	1
1	ε	ε^2	ε^3	ε^4	ε^5	ε^6	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6	⋯	1	ε	ε^2	ε^3	ε^4
1	ε^2	ε^4	ε^6	ε	ε^3	ε^5	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5	⋯	1	ε^2	ε^4	ε^6	ε
1	ε^3	ε^6	ε^2	ε^5	ε	ε^4	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4	⋯	1	ε^3	ε^6	ε^2	ε^5
1	ε^4	ε	ε^5	ε^2	ε^6	ε^3	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3	⋯	1	ε^4	ε	ε^5	ε^2
1	ε^5	ε^3	ε	ε^6	ε^4	ε^2	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2	⋯	1	ε^5	ε^3	ε	ε^6
1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1	⋯	1	ε^6	ε^5	ε^4	ε^3
2	2	2	2	2	2	2	$v^{2(n-1)}+v^2$	$v^{2(n-1)}+v^2$	$v^{2(n-1)}+v^2$	$v^{2(n-1)}+v^2$	$v^{2(n-1)}+v^2$	$v^{2(n-1)}+v^2$	$v^{2(n-1)}+v^2$	⋯	v^4+v^{2n-4}	v^4+v^{2n-4}	v^4+v^{2n-4}	v^4+v^{2n-4}	v^4+v^{2n-4}
2	2ε	$2\varepsilon^2$	$2\varepsilon^3$	$2\varepsilon^4$	$2\varepsilon^5$	$2\varepsilon^6$	$v^{2(n-1)}+v^2$	$\varepsilon(v^{2(n-1)}+v^2)$	$\varepsilon^2(v^{2(n-1)}+v^2)$	$\varepsilon^3(v^{2(n-1)}+v^2)$	$\varepsilon^4(v^{2(n-1)}+v^2)$	$\varepsilon^5(v^{2(n-1)}+v^2)$	$\varepsilon^6(v^{2(n-1)}+v^2)$	⋯	v^4+v^{2n-4}	$\varepsilon(v^4+v^{2n-4})$	$\varepsilon^2(v^4+v^{2n-4})$	$\varepsilon^3(v^4+v^{2n-4})$	$\varepsilon^4(v^4+v^{2n-4})$
2	$2\varepsilon^2$	$2\varepsilon^4$	$2\varepsilon^6$	2ε	$2\varepsilon^3$	$2\varepsilon^5$	$v^{2(n-1)}+v^2$	$\varepsilon^2(v^{2(n-1)}+v^2)$	$\varepsilon^4(v^{2(n-1)}+v^2)$	$\varepsilon^6(v^{2(n-1)}+v^2)$	$\varepsilon(v^{2(n-1)}+v^2)$	$\varepsilon^3(v^{2(n-1)}+v^2)$	$\varepsilon^5(v^{2(n-1)}+v^2)$	⋯	v^4+v^{2n-4}	$\varepsilon^2(v^4+v^{2n-4})$	$\varepsilon^4(v^4+v^{2n-4})$	$\varepsilon^6(v^4+v^{2n-4})$	$\varepsilon(v^4+v^{2n-4})$
2	$2\varepsilon^3$	$2\varepsilon^6$	$2\varepsilon^2$	$2\varepsilon^5$	2ε	$2\varepsilon^4$	$v^{2(n-1)}+v^2$	$\varepsilon^3(v^{2(n-1)}+v^2)$	$\varepsilon^6(v^{2(n-1)}+v^2)$	$\varepsilon^2(v^{2(n-1)}+v^2)$	$\varepsilon^5(v^{2(n-1)}+v^2)$	$\varepsilon(v^{2(n-1)}+v^2)$	$\varepsilon^4(v^{2(n-1)}+v^2)$	⋯	v^4+v^{2n-4}	$\varepsilon^3(v^4+v^{2n-4})$	$\varepsilon^6(v^4+v^{2n-4})$	$\varepsilon^2(v^4+v^{2n-4})$	$\varepsilon^5(v^4+v^{2n-4})$
2	$2\varepsilon^4$	2ε	$2\varepsilon^5$	$2\varepsilon^2$	$2\varepsilon^6$	$2\varepsilon^3$	$v^{2(n-1)}+v^2$	$\varepsilon^4(v^{2(n-1)}+v^2)$	$\varepsilon(v^{2(n-1)}+v^2)$	$\varepsilon^5(v^{2(n-1)}+v^2)$	$\varepsilon^2(v^{2(n-1)}+v^2)$	$\varepsilon^6(v^{2(n-1)}+v^2)$	$\varepsilon^3(v^{2(n-1)}+v^2)$	⋯	(v^4+v^{2n-4})	$\varepsilon^4(v^4+v^{2n-4})$	$\varepsilon(v^4+v^{2n-4})$	$\varepsilon^5(v^4+v^{2n-4})$	$\varepsilon^2(v^4+v^{2n-4})$
2	$2\varepsilon^5$	$2\varepsilon^3$	2ε	$2\varepsilon^6$	$2\varepsilon^4$	$2\varepsilon^2$	$v^{2(n-1)}+v^2$	$\varepsilon^5(v^{2(n-1)}+v^2)$	$\varepsilon^3(v^{2(n-1)}+v^2)$	$\varepsilon(v^{2(n-1)}+v^2)$	$\varepsilon^6(v^{2(n-1)}+v^2)$	$\varepsilon^4(v^{2(n-1)}+v^2)$	$\varepsilon^2(v^{2(n-1)}+v^2)$	⋯	v^4+v^{2n-4}	$\varepsilon^5(v^4+v^{2n-4})$	$\varepsilon^3(v^4+v^{2n-4})$	$\varepsilon(v^4+v^{2n-4})$	$\varepsilon^6(v^4+v^{2n-4})$
2	$2\varepsilon^6$	$2\varepsilon^5$	$2\varepsilon^4$	$2\varepsilon^3$	$2\varepsilon^2$	$2\varepsilon^1$	$v^{2(n-1)}+v^2$	$\varepsilon^6(v^{2(n-1)}+v^2)$	$\varepsilon^5(v^{2(n-1)}+v^2)$	$\varepsilon^4(v^{2(n-1)}+v^2)$	$\varepsilon^3(v^{2(n-1)}+v^2)$	$\varepsilon^2(v^{2(n-1)}+v^2)$	$\varepsilon(v^{2(n-1)}+v^2)$	⋯	v^4+v^{2n-4}	$\varepsilon^6(v^4+v^{2n-4})$	$\varepsilon^5(v^4+v^{2n-4})$	$\varepsilon^4(v^4+v^{2n-4})$	$\varepsilon^3(v^4+v^{2n-4})$
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋱	⋮	⋮	⋮	⋮	⋮
2	2	2	2	2	2	2	$v^{n+1}+v^{n-1}$	$v^{n+1}+v^{n-1}$	$v^{n+1}+v^{n-1}$	$v^{n+1}+v^{n-1}$	$v^{n+1}+v^{n-1}$	$v^{n+1}+v^{n-1}$	$v^{n+1}+v^{n-1}$	⋯	v^4+v^{2n-4}	$v^{2(n-1)}+v^2$	$v^{2(n-1)}+v^2$	$v^{2(n-1)}+v^2$	$v^{2(n-1)}+v^2$
2	2ε	$2\varepsilon^2$	$2\varepsilon^3$	$2\varepsilon^4$	$2\varepsilon^5$	$2\varepsilon^6$	$v^{n+1}+v^{n-1}$	$\varepsilon(v^{n+1}+v^{n-1})$	$\varepsilon^2(v^{n+1}+v^{n-1})$	$\varepsilon^3(v^{n+1}+v^{n-1})$	$\varepsilon^4(v^{n+1}+v^{n-1})$	$\varepsilon^5(v^{n+1}+v^{n-1})$	$\varepsilon^6(v^{n+1}+v^{n-1})$	⋯	$\varepsilon^6(v^4+v^{2n-4})$	$\varepsilon(v^{2(n-1)}+v^2)$	$\varepsilon^2(v^{2(n-1)}+v^2)$	$\varepsilon^3(v^{2(n-1)}+v^2)$	$\varepsilon^4(v^{2(n-1)}+v^2)$
2	$2\varepsilon^2$	$2\varepsilon^4$	$2\varepsilon^6$	2ε	$2\varepsilon^3$	$2\varepsilon^5$	$v^{n+1}+v^{n-1}$	$\varepsilon^2(v^{n+1}+v^{n-1})$	$\varepsilon^4(v^{n+1}+v^{n-1})$	$\varepsilon^6(v^{n+1}+v^{n-1})$	$\varepsilon(v^{n+1}+v^{n-1})$	$\varepsilon^3(v^{n+1}+v^{n-1})$	$\varepsilon^5(v^{n+1}+v^{n-1})$	⋯	$\varepsilon^5(v^4+v^{2n-4})$	$\varepsilon^2(v^{2(n-1)}+v^2)$	$\varepsilon^4(v^{2(n-1)}+v^2)$	$\varepsilon^6(v^{2(n-1)}+v^2)$	$\varepsilon(v^{2(n-1)}+v^2)$
2	$2\varepsilon^3$	$2\varepsilon^6$	$2\varepsilon^2$	$2\varepsilon^5$	2ε	$2\varepsilon^4$	$v^{n+1}+v^{n-1}$	$\varepsilon^3(v^{n+1}+v^{2n-4})$	$\varepsilon^6(v^{n+1}+v^{2n-4})$	$\varepsilon^2(v^{n+1}+v^{2n-4})$	$\varepsilon^5(v^{n+1}+v^{2n-4})$	$\varepsilon(v^{n+1}+v^{2n-4})$	$\varepsilon^4(v^{n+1}+v^{2n-4})$	⋯	$\varepsilon^4(v^4+v^{2n-4})$	$\varepsilon^3(v^{2(n-1)}+v^2)$	$\varepsilon^6(v^{2(n-1)}+v^2)$	$\varepsilon^2(v^{2(n-1)}+v^2)$	$\varepsilon^5(v^{2(n-1)}+v^2)$
2	$2\varepsilon^4$	2ε	$2\varepsilon^5$	$2\varepsilon^2$	$2\varepsilon^6$	$2\varepsilon^3$	$(v^{n+1}+v^{n-1})$	$\varepsilon^4(v^{n+1}+v^{2n-4})$	$\varepsilon(v^{n+1}+v^{n-1})$	$\varepsilon^5(v^{n+1}+v^{n-1})$	$\varepsilon^2(v^{n+1}+v^{n-1})$	$\varepsilon^6(v^{n+1}+v^{n-1})$	$\varepsilon^3(v^{n+1}+v^{n-1})$	⋯	$\varepsilon^3(v^4+v^{2n-4})$	$\varepsilon^4(v^{2(n-1)}+v^2)$	$\varepsilon(v^{2(n-1)}+v^2)$	$\varepsilon^5(v^{2(n-1)}+v^2)$	$\varepsilon^2(v^{2(n-1)}+v^2)$

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2	$2\varepsilon^5$	$2\varepsilon^3$	2ε	$2\varepsilon^6$	$2\varepsilon^4$	$2\varepsilon^2$	$\upsilon^{n+1}+\upsilon^{n-1}$	$\varepsilon^5(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^3(\upsilon^4+\upsilon^{n-1})$	$\varepsilon(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^6(\upsilon^4+\upsilon^{n-1})$	$\varepsilon^4(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^2(\upsilon^{n+1}+\upsilon^{n-1})$	$\cdots$	$\varepsilon^2(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^5(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2(n-1)}+\upsilon^2)$
2	$2\varepsilon^6$	$2\varepsilon^5$	$2\varepsilon^4$	$2\varepsilon^3$	$2\varepsilon^2$	$2\varepsilon^1$	$\upsilon^{n+1}+\upsilon^{n-1}$	$\varepsilon^6(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^5(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^4(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^3(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon^2(\upsilon^{n+1}+\upsilon^{n-1})$	$\varepsilon(\upsilon^{n+1}+\upsilon^{n-1})$	$\cdots$	$\varepsilon(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^6(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2(n-1)}+\upsilon^2)$
1	1	1	1	1	1	1	1	1	1	1	1	1	1	$\cdots$	1	1	1	1	1
1	ε	ε^2	ε^3	ε^4	ε^5	ε^6	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6	$\cdots$	1	ε	ε^2	ε^3	ε^4
1	ε^2	ε^4	ε^6	ε	ε^3	ε^5	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5	$\cdots$	1	ε^2	ε^4	ε^6	ε
1	ε^3	ε^6	ε^2	ε^5	ε	ε^4	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4	$\cdots$	1	ε^3	ε^6	ε^2	ε^5
1	ε^4	ε	ε^5	ε^2	ε^6	ε^3	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3	$\cdots$	1	ε^4	ε	ε^5	ε^2
1	ε^5	ε^3	ε	ε^6	ε^4	ε^2	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2	$\cdots$	1	ε^5	ε^3	ε	ε^6
1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1	$\cdots$	1	ε^6	ε^5	ε^4	ε^3

$\equiv(Q_{2n}\times C_7)$ =

$[s^{n-2},x^5]$	$[s^{n-2},x^6]$	[y,1]	[y,x]	$[y,x^2]$	$[y, x^3]$	$[y, x^4]$	$[y, x^5]$	$[y, x^6]$	[xy,1]	[xy,x]	$[xy, x^2]$	$[xy, x^3]$	$[xy, x^4]$	$[xy, x^5]$	$[xy, x^6]$
2	2	n	n	n	n	n	n	n	n	n	n	n	n	n	n
14n	14n	28	28	28	28	28	28	28	28	28	28	28	28	28	28
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ε^5	ε^6	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6
ε^3	ε^5	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5
ε	ε^4	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4
ε^6	ε^3	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3
ε^4	ε^2	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2
ε^2	ε^1	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1
$\upsilon^4+\upsilon^{2n-4}$	$\upsilon^4+\upsilon^{2n-4}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon^5(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^6(\upsilon^4+\upsilon^{2n-4})$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon^3(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^5(\upsilon^4+\upsilon^{2n-4})$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^4(\upsilon^4+\upsilon^{2n-4})$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon^6(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^3(\upsilon^4+\upsilon^{2n-4})$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon^4(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon^2(\upsilon^4+\upsilon^{2n-4})$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon^2(\upsilon^4+\upsilon^{2n-4})$	$\varepsilon(\upsilon^4+\upsilon^{2n-4})$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$
$\upsilon^{2(n-1)}+\upsilon^2$	$\upsilon^{2(n-1)}+\upsilon^2$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon^5(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon^6(\upsilon^{2(n-1)}+\upsilon^2)$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon^3(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon^5(\upsilon^{2(n-1)}+\upsilon^2)$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon^4(\upsilon^{2(n-1)}+\upsilon^2)$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon^6(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon^3(\upsilon^{2(n-1)}+\upsilon^2)$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon^4(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon^2(\upsilon^{2(n-1)}+\upsilon^2)$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\varepsilon^2(\upsilon^{2(n-1)}+\upsilon^2)$	$\varepsilon(\upsilon^{2(n-1)}+\upsilon^2)$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
ε^5	ε^6	-1	$-\varepsilon$	$-\varepsilon^2$	$-\varepsilon^3$	$-\varepsilon^4$	$-\varepsilon^5$	$-\varepsilon^6$	-1	$-\varepsilon$	$-\varepsilon^2$	$-\varepsilon^3$	$-\varepsilon^4$	$-\varepsilon^5$	$-\varepsilon^6$
ε^3	ε^5	-1	$-\varepsilon^2$	$-\varepsilon^4$	$-\varepsilon^6$	$-\varepsilon$	$-\varepsilon^3$	$-\varepsilon^5$	-1	$-\varepsilon^2$	$-\varepsilon^4$	$-\varepsilon^6$	$-\varepsilon$	$-\varepsilon^3$	$-\varepsilon^5$
ε	ε^4	-1	$-\varepsilon^3$	$-\varepsilon^6$	$-\varepsilon^2$	$-\varepsilon^5$	$-\varepsilon$	$-\varepsilon^4$	-1	$-\varepsilon^3$	$-\varepsilon^6$	$-\varepsilon^2$	$-\varepsilon^5$	$-\varepsilon$	$-\varepsilon^4$

ε^6	ε^3	-1	$-\varepsilon^4$	$-\varepsilon$	$-\varepsilon^5$	$-\varepsilon^2$	$-\varepsilon^6$	$-\varepsilon^3$	-1	$-\varepsilon^4$	$-\varepsilon$	$-\varepsilon^5$	$-\varepsilon^2$	$-\varepsilon^6$	$-\varepsilon^3$
ε^4	ε^2	-1	$-\varepsilon^5$	$-\varepsilon^3$	$-\varepsilon$	$-\varepsilon^6$	$-\varepsilon^4$	$-\varepsilon^2$	-1	$-\varepsilon^5$	$-\varepsilon^3$	$-\varepsilon$	$-\varepsilon^6$	$-\varepsilon^4$	$-\varepsilon^2$
ε^2	ε^1	-1	$-\varepsilon^6$	$-\varepsilon^5$	$-\varepsilon^4$	-ε^3	-ε^2	$-\varepsilon^1$	-1	$-\varepsilon^6$	$-\varepsilon^5$	$-\varepsilon^4$	$-\varepsilon^3$	$-\varepsilon^2$	$-\varepsilon^1$

≡(Q_{2n}×C_7) =

$\mu_{(1,1)}$	2	2	2	2	2	2	2	υ^2	υ^2	υ^2	υ^2	υ^2	υ^2	υ^2	⋯	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	$2\upsilon^n$	$2\upsilon^n$	$2\upsilon^n$	$2\upsilon^n$	$2\upsilon^n$	$2\upsilon^n$	$2\upsilon^n$
$\mu_{(1,2)}$	2	2ε	$2\varepsilon^2$	$2\varepsilon^3$	$2\varepsilon^4$	$2\varepsilon^5$	$2\varepsilon^6$	υ^2	$\varepsilon\,\upsilon^2$	$\varepsilon^2\upsilon^2$	$\varepsilon^3\upsilon^2$	$\varepsilon^4\upsilon^2$	$\varepsilon^5\upsilon^2$	$\varepsilon^6\upsilon^2$	⋯	υ^{n-1}	$\varepsilon\upsilon^{n-1}$	$\varepsilon^2\upsilon^{n-1}$	$\varepsilon^3\upsilon^{n-1}$	$\varepsilon^4\upsilon^{n-1}$	$\varepsilon^5\upsilon^{n-1}$	$\varepsilon^6\upsilon^{n-1}$	$2\upsilon^n$	$2\varepsilon\upsilon^n$	$2\varepsilon^2\upsilon^n$	$2\varepsilon^3$ õ^n	$2\varepsilon^4\upsilon^n$	$2\varepsilon^5\upsilon^n$	$2\varepsilon^6\upsilon^n$
$\mu_{(1,3)}$	2	$2\varepsilon^2$	$2\varepsilon^4$	$2\varepsilon^6$	2ε	$2\varepsilon^3$	$2\varepsilon^5$	υ^2	$\varepsilon^2\upsilon^2$	$\varepsilon^4\upsilon^2$	$\varepsilon^6\upsilon^2$	$\varepsilon\upsilon^2$	$\varepsilon^3\upsilon^2$	$\varepsilon^5\upsilon^2$	⋯	υ^{n-1}	$\varepsilon^2\upsilon^{n-1}$	$\varepsilon^4\upsilon^{n-1}$	$\varepsilon^6\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^3\upsilon^{n-1}$	$\varepsilon^5\upsilon^{n-1}\upsilon^n$	$2\upsilon^n$	$2\varepsilon^2\upsilon^n$	$2\varepsilon^4\upsilon^n$	$2\varepsilon^6\upsilon^n$	$2\varepsilon\upsilon^n$	$2\varepsilon^3\upsilon^n$	$2\varepsilon^5\upsilon^n$
$\mu_{(1,4)}$	2	$2\varepsilon^3$	$2\varepsilon^6$	$2\varepsilon^2$	$2\varepsilon^5$	2ε	$2\varepsilon^4$	υ^2	$\varepsilon^3\upsilon^2$	$\varepsilon^6\upsilon^2$	$\varepsilon^2\upsilon^2$	$\varepsilon^5\upsilon^2$	$\varepsilon\upsilon^2$	$\varepsilon^4\upsilon^2$	⋯	υ^{n-1}	$\varepsilon^3\upsilon^{n-1}$	$\varepsilon^6\upsilon^{n-1}$	$\varepsilon^2\upsilon^{n-1}$	$\varepsilon^5\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^4\upsilon^{n-1}$	$2\upsilon^n$	$2\varepsilon^3\upsilon^n$	$2\varepsilon^6\upsilon^n$	$2\varepsilon^2\upsilon^n$	$2\varepsilon^5\upsilon^n$	$2\varepsilon\upsilon^n$	$2\varepsilon^4\upsilon^n$
$\mu_{(1,5)}$	2	$2\varepsilon^4$	2ε	$2\varepsilon^5$	$2\varepsilon^2$	$2\varepsilon^6$	$2\varepsilon^3$	υ^2	$\varepsilon^4\upsilon^2$	$\varepsilon\upsilon^2$	$\varepsilon^5\upsilon^2$	$\varepsilon^2\upsilon^2$	$\varepsilon^6\upsilon^2$	$\varepsilon^3\upsilon^2$	⋯	υ^{n-1}	$\varepsilon^4\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^5\upsilon^{n-1}$	$\varepsilon^2\upsilon^{n-1}$	$\varepsilon^6\upsilon^{n-1}$	$\varepsilon^3\upsilon^{n-1}$	$2\upsilon^n$	$2\varepsilon^4\upsilon^n$	$2\varepsilon\upsilon^n$	$2\varepsilon^5\upsilon^n$	$2\varepsilon^2\upsilon^n$	$2\varepsilon^6\upsilon^n$	$2\varepsilon^3\upsilon^n$
$\mu_{(1,6)}$	2	$2\varepsilon^5$	$2\varepsilon^3$	2ε	$2\varepsilon^6$	$2\varepsilon^4$	$2\varepsilon^2$	υ^2	$\varepsilon^5\upsilon^2$	$\varepsilon^3\upsilon^2$	$\varepsilon\upsilon^2$	$\varepsilon^6\upsilon^2$	$\varepsilon^4\upsilon^2$	$\varepsilon^2\upsilon^2$	⋯	υ^{n-1}	ε^5 õ$^{n-1}$	$\varepsilon^3\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^6\upsilon^{n-1}$	$\varepsilon^4\upsilon^{n-1}$	$\varepsilon^2\upsilon^{n-1}$	$2\upsilon^n$	$2\varepsilon^5\upsilon^n$	$2\varepsilon^3\upsilon^n$	$2\varepsilon\upsilon^n$	$2\varepsilon^6\upsilon^n$	$2\varepsilon^4\upsilon^n$	$2\varepsilon^2\upsilon^n$
$\mu_{(1,7)}$	2	$2\varepsilon^6$	$2\varepsilon^5$	$2\varepsilon^4$	$2\varepsilon^3$	$2\varepsilon^2$	$2\varepsilon^1$	υ^2	$\varepsilon^6\upsilon^2$	$\varepsilon^5\upsilon^2$	$\varepsilon^4\upsilon^2$	$\varepsilon^3\upsilon^2$	$\varepsilon^2\upsilon^2$	å υ^2	⋯	υ^{n-1}	$\varepsilon^6\upsilon^{n-1}$	$\varepsilon^5\upsilon^{n-1}$	$\varepsilon^4\upsilon^{n-1}$	$\varepsilon^3\upsilon^{n-1}$	$\varepsilon^2\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$2\upsilon^n$	$2\varepsilon^6\upsilon^n$	$2\varepsilon^5\upsilon^n$	$2\varepsilon^4\upsilon^n$	$2\varepsilon^3\upsilon^n$	$2\varepsilon^2\upsilon^n$	$2\varepsilon^1\upsilon^n$
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋱	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
$\mu_{((m-2),1)}$	2	2	2	2	2	2	2	υ^4	υ^4	υ^4	υ^4	υ^4	υ^4	υ^4	⋯	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	$2\upsilon^n$	$2\upsilon^n$	$2\upsilon^n$	$2\upsilon^n$	$2\upsilon^n$	$2\upsilon^n$	$2\upsilon^n$
$\mu_{((m-2),2)}$	2	2ε	$2\varepsilon^2$	$2\varepsilon^3$	$2\varepsilon^4$	$2\varepsilon^5$	$2\varepsilon^6$	υ^4	$\varepsilon\,\upsilon^4$	$\varepsilon^2\upsilon^4$	$\varepsilon^3\upsilon^4$	$\varepsilon^4\upsilon^4$	$\varepsilon^5\upsilon^4$	$\varepsilon^6\upsilon^4$	⋯	υ^{n-1}	$\varepsilon\upsilon^{n-1}$	$\varepsilon^2\upsilon^{n-1}$	$\varepsilon^3\upsilon^{n-1}$	$\varepsilon^4\upsilon^{n-1}$	$\varepsilon^5\upsilon^{n-1}$	$\varepsilon^6\upsilon^{n-1}$	$2\upsilon^n$	$2\varepsilon\upsilon^n$	$2\varepsilon^2\upsilon^n$	$2\varepsilon^3\upsilon^n$	$2\varepsilon^4\upsilon^n$	$2\varepsilon^5\upsilon^n$	$2\varepsilon^6\upsilon^n$
$\mu_{((m-2),3)}$	2	$2\varepsilon^2$	$2\varepsilon^4$	$2\varepsilon^6$	2ε	$2\varepsilon^3$	$2\varepsilon^5$	υ^4	$\varepsilon^2\upsilon^4$	$\varepsilon^4\upsilon^4$	$\varepsilon^6\upsilon^4$	$\varepsilon\upsilon^4$	$\varepsilon^3\upsilon^4$	$\varepsilon^5\upsilon^4$	⋯	υ^{n-1}	$\varepsilon^2\upsilon^{n-1}$	$\varepsilon^4\upsilon^{n-1}$	$\varepsilon^6\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^3\upsilon^{n-1}$	$\varepsilon^5\upsilon^{n-1}\upsilon^n$	$2\upsilon^n$	$2\varepsilon^2\upsilon^n$	$2\varepsilon^4\upsilon^n$	$2\varepsilon^6\upsilon^n$	$2\varepsilon\upsilon^n$	$2\varepsilon^3\upsilon^n$	$2\varepsilon^5\upsilon^n$
$\mu_{((m-2),4)}$	2	$2\varepsilon^3$	$2\varepsilon^6$	$2\varepsilon^2$	$2\varepsilon^5$	2ε	$2\varepsilon^4$	υ^4	$\varepsilon^3\upsilon^4$	$\varepsilon^6\upsilon^4$	$\varepsilon^2\upsilon^4$	$\varepsilon^5\upsilon^4$	$\varepsilon\upsilon^4$	$\varepsilon^4\upsilon^4$	⋯	υ^{n-1}	$\varepsilon^3\upsilon^{n-1}$	$\varepsilon^6\upsilon^{n-1}$	$\varepsilon^2\upsilon^{n-1}$	$\varepsilon^5\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^4\upsilon^{n-1}$	$2\upsilon^n$	$2\varepsilon^3\upsilon^n$	$2\varepsilon^6\upsilon^n$	$2\varepsilon^2\upsilon^n$	$2\varepsilon^5\upsilon^n$	$2\varepsilon\upsilon^n$	$2\varepsilon^4\upsilon^n$
$\mu_{((m-2),5)}$	2	$2\varepsilon^4$	2ε	$2\varepsilon^5$	$2\varepsilon^2$	$2\varepsilon^6$	$2\varepsilon^3$	υ^4	$\varepsilon^4\upsilon^4$	$\varepsilon\upsilon^4$	$\varepsilon^5\upsilon^4$	$\varepsilon^2\upsilon^4$	$\varepsilon^6\upsilon^4$	$\varepsilon^3\upsilon^4$	⋯	υ^{n-1}	$\varepsilon^4\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^5\upsilon^{n-1}$	$\varepsilon^2\upsilon^{n-1}$	$\varepsilon^6\upsilon^{n-1}$	$\varepsilon^3\upsilon^{n-1}$	$2\upsilon^n$	$2\varepsilon^4\upsilon^n$	$2\varepsilon\upsilon^n$	$2\varepsilon^5\upsilon^n$	$2\varepsilon^2\upsilon^n$	$2\varepsilon^6\upsilon^n$	$2\varepsilon^3\upsilon^n$
$\mu_{((m-2),6)}$	2	$2\varepsilon^5$	$2\varepsilon^3$	2ε	$2\varepsilon^6$	$2\varepsilon^4$	$2\varepsilon^2$	υ^4	$\varepsilon^5\upsilon^4$	$\varepsilon^3\upsilon^4$	$\varepsilon\upsilon^4$	$\varepsilon^6\upsilon^4$	$\varepsilon^4\upsilon^4$	$\varepsilon^2\upsilon^4$	⋯	υ^{n-1}	$\varepsilon^5\upsilon^{n-1}$	$\varepsilon^3\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^6\upsilon^{n-1}$	$\varepsilon^4\upsilon^{n-1}$	$\varepsilon^2\upsilon^{n-1}$	$2\upsilon^n$	$2\varepsilon^5\upsilon^n$	$2\varepsilon^3\upsilon^n$	$2\varepsilon\upsilon^n$	$2\varepsilon^6\upsilon^n$	$2\varepsilon^4$ õ^n	$2\varepsilon^2\upsilon^n$
$\mu_{((m-2),7)}$	2	$2\varepsilon^6$	$2\varepsilon^5$	$2\varepsilon^4$	$2\varepsilon^3$	$2\varepsilon^2$	$2\varepsilon^1$	υ^4	$\varepsilon^6\upsilon^4$	$\varepsilon^5\upsilon^4$	$\varepsilon^4\upsilon^4$	$\varepsilon^3\upsilon^4$	$\varepsilon^2\upsilon^4$	$\varepsilon\,\upsilon^4$	⋯	υ^{n-1}	$\varepsilon^6\upsilon^{n-1}$	$\varepsilon^5\upsilon^{n-1}$	$\varepsilon^4\upsilon^{n-1}$	$\varepsilon^3\upsilon^{n-1}$	$\varepsilon^2\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$2\upsilon^n$	$2\varepsilon^6\upsilon^n$	$2\varepsilon^5\upsilon^n$	$2\varepsilon^4\upsilon^n$	$2\varepsilon^3\upsilon^n$	$2\varepsilon^2\upsilon^n$	$2\varepsilon^1\upsilon^n$
$\lambda_{(3,1)}$	1	1	1	1	1	1	1	1	1	1	1	1	1	1	⋯	1	1	1	1	1	1	1	-1	-1	-1	-1	-1	-1	-1
$\lambda_{(3,2)}$	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6	⋯	1	ε	ε^2	ε^3	ε^4	ε^5	ε^6	-1	$-\varepsilon$	$-\varepsilon^2$	$-\varepsilon^3$	$-\varepsilon^4$	$-\varepsilon^5$	$-\varepsilon^6$
$\lambda_{(3,3)}$	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5	⋯	1	ε^2	ε^4	ε^6	ε	ε^3	ε^5	-1	$-\varepsilon^2$	$-\varepsilon^4$	$-\varepsilon^6$	-ε	$-\varepsilon^3$	$-\varepsilon^5$
$\lambda_{(3,4)}$	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4	⋯	1	ε^3	ε^6	ε^2	ε^5	ε	ε^4	-1	$-\varepsilon^3$	$-\varepsilon^6$	$-\varepsilon^2$	$-\varepsilon^5$	$-\varepsilon$	$-\varepsilon^4$
$\lambda_{(3,5)}$	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3	⋯	1	ε^4	ε	ε^5	ε^2	ε^6	ε^3	-1	$-\varepsilon^4$	$-\varepsilon$	$-\varepsilon^5$	$-\varepsilon^2$	$-\varepsilon^6$	$-\varepsilon^3$
$\lambda_{(3,6)}$	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2	⋯	1	ε^5	ε^3	ε	ε^6	ε^4	ε^2	-1	$-\varepsilon^5$	$-\varepsilon^3$	$-\varepsilon$	$-\varepsilon^6$	$-\varepsilon^4$	$-\varepsilon^2$
$\lambda_{(3,7)}$	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1	⋯	1	ε^6	ε^5	ε^4	ε^3	ε^2	ε^1	-1	$-\varepsilon^6$	$-\varepsilon^5$	$-\varepsilon^4$	-ε^3	-ε^2	$-\varepsilon^1$
$\lambda_{(4,1)}$	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	⋯	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
$\lambda_{(4,2)}$	-1	$-\varepsilon$	$-\varepsilon^2$	$-\varepsilon^3$	$-\varepsilon^4$	$-\varepsilon^5$	$-\varepsilon^6$	-1	$-\varepsilon$	$-\varepsilon^2$	$-\varepsilon^3$	$-\varepsilon^4$	$-\varepsilon^5$	$-\varepsilon^6$	⋯	-1	$-\varepsilon$	$-\varepsilon^2$	$-\varepsilon^3$	$-\varepsilon^4$	$-\varepsilon^5$	$-\varepsilon^6$	-1	$-\varepsilon$	$-\varepsilon^2$	$-\varepsilon^3$	$-\varepsilon^4$	$-\varepsilon^5$	$-\varepsilon^6$

$\lambda_{(4,3)}$	-1	$-\varepsilon^{2}$	$-\varepsilon^{4}$	$-\varepsilon^{6}$	$-\varepsilon$	$-\varepsilon^{3}$	$-\varepsilon^{5}$	-1	$-\varepsilon^{2}$	$-\varepsilon^{4}$	$-\varepsilon$ 6	$-\varepsilon$	$-\varepsilon$ 3	$-\varepsilon$ 5	$\cdots$	-1	$-\varepsilon^{2}$	$-\varepsilon^{4}$	$-\varepsilon^{6}$	$-\varepsilon$	$-\varepsilon^{3}$	$-\varepsilon^{5}$	-1	$-\varepsilon^{2}$	$-\varepsilon^{4}$	$-\varepsilon^{6}$	$-\varepsilon$	$-\varepsilon^{3}$	$-\varepsilon^{5}$
$\lambda_{(4,4)}$	-1	$-\varepsilon^{3}$	$-\varepsilon^{6}$	$-\varepsilon^{2}$	$-\varepsilon^{5}$	$-\varepsilon$	$-\varepsilon^{4}$	-1	$-\varepsilon^{3}$	$-\varepsilon^{6}$	$-\varepsilon$ 2	$-\varepsilon$ 5	$-\varepsilon$	$-\varepsilon$ 4	$\cdots$	-1	$-\varepsilon^{3}$	$-\varepsilon^{6}$	$-\varepsilon^{2}$	$-\varepsilon^{5}$	$-\varepsilon$	$-\varepsilon^{4}$	-1	$-\varepsilon^{3}$	$-\varepsilon^{6}$	$-\varepsilon^{2}$	$-\varepsilon^{5}$	$-\varepsilon$	$-\varepsilon^{4}$
$\lambda_{(4,5)}$	-1	$-\varepsilon^{4}$	$-\varepsilon$	$-\varepsilon^{5}$	$-\varepsilon^{2}$	$-\varepsilon^{6}$	$-\varepsilon^{3}$	-1	$-\varepsilon^{4}$	$-\varepsilon$	$-\varepsilon$ 5	$-\varepsilon$ 2	$-\varepsilon$ 6	$-\varepsilon$ 3	$\cdots$	-1	$-\varepsilon^{4}$	$-\varepsilon$	$-\varepsilon^{5}$	$-\varepsilon^{2}$	$-\varepsilon^{6}$	$-\varepsilon^{3}$	-1	$-\varepsilon^{4}$	$-\varepsilon$	$-\varepsilon^{5}$	$-\varepsilon^{2}$	$-\varepsilon^{6}$	$-\varepsilon^{3}$
$\lambda_{(4,6)}$	-1	$-\varepsilon^{5}$	$-\varepsilon^{3}$	$-\varepsilon$	$-\varepsilon^{6}$	$-\varepsilon^{4}$	$-\varepsilon^{2}$	-1	$-\varepsilon^{5}$	$-\varepsilon^{3}$	$-\varepsilon$	$-\varepsilon$ 6	$-\varepsilon$ 4	$-\varepsilon$ 2	$\cdots$	-1	$-\varepsilon^{5}$	$-\varepsilon^{3}$	$-\varepsilon$	$-\varepsilon^{6}$	$-\varepsilon^{4}$	$-\varepsilon^{2}$	-1	$-\varepsilon^{5}$	$-\varepsilon^{3}$	$-\varepsilon$	$-\varepsilon^{6}$	$-\varepsilon^{4}$	$-\varepsilon^{2}$
$\lambda_{(4,7)}$	-1	$-\varepsilon^{6}$	$-\varepsilon^{5}$	$-\varepsilon^{4}$	$-\varepsilon^{3}$	$-\varepsilon^{2}$	$-\varepsilon^{1}$	-1	$-\varepsilon^{6}$	$-\varepsilon^{5}$	$-\varepsilon$ 4	$-\varepsilon^{3}$	$-\varepsilon^{2}$	$-\varepsilon$ 1	$\cdots$	-1	$-\varepsilon^{6}$	$-\varepsilon^{5}$	$-\varepsilon^{4}$	$-\varepsilon^{3}$	$-\varepsilon^{2}$	$-\varepsilon^{1}$	-1	$-\varepsilon^{6}$	$-\varepsilon^{5}$	$-\varepsilon^{4}$	$-\varepsilon^{3}$	$-\varepsilon^{2}$	$-\varepsilon^{1}$

$\equiv(Q_{2n}\times C_7)$ =

υ	υ	υ	υ	υ	υ	υ	$\cdots$	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	υ^{n-1}	0	0	0	0	0	0	0	0	0	0	0	0	0	0
υ	$\varepsilon\upsilon$	$\varepsilon^{2}\upsilon$	$\varepsilon^{3}\upsilon$	$\varepsilon^{4}\upsilon$	$\varepsilon^{5}\upsilon$	$\varepsilon^{6}\upsilon$	$\cdots$	υ^{n-1}	$\varepsilon\upsilon^{n-1}$	$\varepsilon^{2}\upsilon^{n-1}$	$\varepsilon^{3}\upsilon^{n-1}$	$\varepsilon^{4}\upsilon^{n-1}$	$\varepsilon^{5}\upsilon^{n-1}$	$\varepsilon^{6}\upsilon^{n-1}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
υ	$\varepsilon^{2}\upsilon$	$\varepsilon^{4}\upsilon$	$\varepsilon^{6}\upsilon$	$\varepsilon\upsilon$	$\varepsilon^{3}\upsilon$	$\varepsilon^{5}\upsilon$	$\cdots$	υ^{n-1}	$\varepsilon^{2}\upsilon^{n-1}$	$\varepsilon^{4}\upsilon^{n-1}$	$\varepsilon^{6}\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^{3}\upsilon^{n-1}$	$\varepsilon^{5}\upsilon^{n-1}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
υ	$\varepsilon^{3}\upsilon$	$\varepsilon^{6}\upsilon$	$\varepsilon^{2}\upsilon$	$\varepsilon^{5}\upsilon$	$\varepsilon\upsilon$	$\varepsilon^{4}\upsilon$	$\cdots$	υ^{n-1}	$\varepsilon^{3}\upsilon^{n-1}$	$\varepsilon^{6}\upsilon^{n-1}$	$\varepsilon^{2}\upsilon^{n-1}$	$\varepsilon^{5}\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^{4}\upsilon^{n-1}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
υ	$\varepsilon^{4}\upsilon$	$\varepsilon\upsilon$	$\varepsilon^{5}\upsilon$	$\varepsilon^{2}\upsilon$	$\varepsilon^{6}\upsilon$	$\varepsilon^{3}\upsilon$	$\cdots$	υ^{n-1}	$\varepsilon^{4}\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^{5}\upsilon^{n-1}$	$\varepsilon^{2}\upsilon^{n-1}$	$\varepsilon^{6}\upsilon^{n-1}$	$\varepsilon^{3}\upsilon^{n-1}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
υ	$\varepsilon^{5}\upsilon$	$\varepsilon^{3}\upsilon$	$\varepsilon\upsilon$	$\varepsilon^{6}\upsilon$	$\varepsilon^{4}\upsilon$	$\varepsilon^{2}\upsilon$	$\cdots$	υ^{n-1}	$\varepsilon^{5}\upsilon^{n-1}$	$\varepsilon^{3}\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	$\varepsilon^{6}\upsilon^{n-1}$	$\varepsilon^{4}\upsilon^{n-1}$	$\varepsilon^{2}\upsilon^{n-1}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
υ	$\varepsilon^{6}\upsilon$	$\varepsilon^{5}\upsilon$	$\varepsilon^{4}\upsilon$	$\varepsilon^{3}\upsilon$	$\varepsilon^{2}\upsilon$	$\varepsilon\upsilon$	$\cdots$	υ^{n-1}	$\varepsilon^{6}\upsilon^{n-1}$	$\varepsilon^{5}\upsilon^{n-1}$	$\varepsilon^{4}\upsilon^{n-1}$	$\varepsilon^{3}\upsilon^{n-1}$	$\varepsilon^{2}\upsilon^{n-1}$	$\varepsilon\upsilon^{n-1}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\ddots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$	$\vdots$
-1	-1	-1	-1	-1	-1	-1	$\cdots$	-1	-1	-1	-1	-1	-1	-1	i	i	i	i	i	i	i	-i	-i	-i	-i	-i	-i	-i
-1	$-\varepsilon$	$-\varepsilon^{2}$	$-\varepsilon^{3}$	$-\varepsilon^{4}$	$-\varepsilon^{5}$	$-\varepsilon^{6}$	$\cdots$	-1	$-\varepsilon$	$-\varepsilon^{2}$	$-\varepsilon^{3}$	$-\varepsilon^{4}$	$-\varepsilon^{5}$	$-\varepsilon^{6}$	i	εi	ε^{2}i	ε^{3}i	ε^{4}i	ε^{5}i	ε^{6}i	-i	$-\varepsilon$i	$-\varepsilon^{2}$i	$-\varepsilon^{3}$i	$-\varepsilon^{4}$i	$-\varepsilon^{5}$i	$-\varepsilon^{6}$i
-1	$-\varepsilon^{2}$	$-\varepsilon^{4}$	$-\varepsilon^{6}$	$-\varepsilon$	$-\varepsilon^{3}$	$-\varepsilon^{5}$	$\cdots$	-1	$-\varepsilon^{2}$	$-\varepsilon^{4}$	$-\varepsilon^{6}$	$-\varepsilon$	$-\varepsilon^{3}$	$-\varepsilon^{5}$	i	ε^{2}i	ε^{4}i	ε^{6}i	εi	ε^{3}i	ε^{5}i	-i	$-\varepsilon^{2}$i	$-\varepsilon^{4}$i	$-\varepsilon^{6}$i	$-\varepsilon$i	$-\varepsilon^{3}$i	$-\varepsilon^{5}$i
-1	$-\varepsilon^{3}$	$-\varepsilon^{6}$	$-\varepsilon^{2}$	$-\varepsilon^{5}$	$-\varepsilon$	$-\varepsilon^{4}$	$\cdots$	-1	$-\varepsilon^{3}$	$-\varepsilon^{6}$	$-\varepsilon^{2}$	$-\varepsilon^{5}$	$-\varepsilon$	$-\varepsilon^{4}$	i	ε^{3}i	ε^{6}i	ε^{2}i	ε^{5}i	εi	ε^{4}i	-i	$-\varepsilon^{3}$i	$-\varepsilon^{6}$i	$-\varepsilon^{2}$i	$-\varepsilon^{5}$i	$-\varepsilon$i	$-\varepsilon^{4}$i
-1	$-\varepsilon^{4}$	$-\varepsilon$	$-\varepsilon^{5}$	$-\varepsilon^{2}$	$-\varepsilon^{6}$	$-\varepsilon^{3}$	$\cdots$	-1	$-\varepsilon^{4}$	$-\varepsilon$	$-\varepsilon^{5}$	$-\varepsilon^{2}$	$-\varepsilon^{6}$	$-\varepsilon^{3}$	i	ε^{4}i	εi	ε^{5}i	ε^{2}i	ε^{6}i	ε^{3}i	-i	$-\varepsilon^{4}$i	$-\varepsilon i$	$-\varepsilon^{5}$i	$-\varepsilon^{2}$i	$-\varepsilon^{6}$i	$-\varepsilon^{3}$i
-1	$-\varepsilon^{5}$	$-\varepsilon^{3}$	$-\varepsilon$	$-\varepsilon^{6}$	$-\varepsilon^{4}$	$-\varepsilon^{2}$	$\cdots$	-1	$-\varepsilon^{5}$	$-\varepsilon^{3}$	$-\varepsilon$	$-\varepsilon^{6}$	$-\varepsilon^{4}$	$-\varepsilon^{2}$	i	ε^{5}i	ε^{3}i	εi	ε^{6}i	ε^{4}i	ε^{2}i	-i	$-\varepsilon^{5}$i	$-\varepsilon^{3}$i	$-\varepsilon$i	$-\varepsilon^{6}$i	$-\varepsilon^{4i}$	$-\varepsilon^{2}$i
-1	$-\varepsilon^{6}$	$-\varepsilon^{5}$	$-\varepsilon^{4}$	$-\varepsilon^{3}$	$-\varepsilon^{2}$	$-\varepsilon^{1}$	$\cdots$	-1	$-\varepsilon^{6}$	$-\varepsilon^{5}$	$-\varepsilon^{4}$	$-\varepsilon^{3}$	$-\varepsilon^{2}$	$-\varepsilon^{1}$	i	ε^{6}i	ε^{5}i	ε^{4}i	ε^{3}i	ε^{2}i	ε^{1}i	-i	$-\varepsilon^{6}$i	$-\varepsilon^{5}$i	$-\varepsilon^{4}$i	$-\varepsilon^{3}$i	$-\varepsilon^{2}$i	$-\varepsilon^{1}$i
-1	-1	-1	-1	-1	-1	-1	$\cdots$	-1	-1	-1	-1	-1	-1	-1	-i	-i	-i	-i	-i	-i	-i	i	i	i	i	i	i	i
-1	$-\varepsilon$	$-\varepsilon^{2}$	$-\varepsilon^{3}$	$-\varepsilon^{4}$	$-\varepsilon^{5}$	$-\varepsilon^{6}$	$\cdots$	-1	$-\varepsilon$	$-\varepsilon^{2}$	$-\varepsilon^{3}$	$-\varepsilon^{4}$	$-\varepsilon^{5}$	$-\varepsilon^{6}$	-i	$-\varepsilon$i	$-\varepsilon^{2}$i	$-\varepsilon^{3}$i	$-\varepsilon^{4}$i	$-\varepsilon^{5}$i	$-\varepsilon^{6}$i	i	εi	ε^{2}i	ε^{3}i	ε^{4}i	ε^{5}i	ε^{6}i
-1	$-\varepsilon^{2}$	$-\varepsilon^{4}$	$-\varepsilon^{6}$	$-\varepsilon$	$-\varepsilon^{3}$	$-\varepsilon^{5}$	$\cdots$	-1	$-\varepsilon^{2}$	$-\varepsilon^{4}$	$-\varepsilon^{6}$	$-\varepsilon$	$-\varepsilon^{3}$	$-\varepsilon^{5}$	-i	$-\varepsilon^{2}$i	$-\varepsilon^{4}$i	$-\varepsilon^{6}$i	$-\varepsilon$i	$-\varepsilon^{3}$i	$-\varepsilon^{5}$i	i	ε^{2}i	ε^{4}i	ε^{6}i	εi	ε^{3}i	ε^{5}i
-1	$-\varepsilon^{3}$	$-\varepsilon^{6}$	$-\varepsilon^{2}$	$-\varepsilon^{5}$	$-\varepsilon$	$-\varepsilon^{4}$	$\cdots$	-1	$-\varepsilon^{3}$	$-\varepsilon^{6}$	$-\varepsilon^{2}$	$-\varepsilon^{5}$	$-\varepsilon$	$-\varepsilon^{4}$	-i	$-\varepsilon^{3}$i	$-\varepsilon^{6}$i	$-\varepsilon^{2}$i	$-\varepsilon^{5}$i	$-\varepsilon$i	$-\varepsilon^{4}$i	i	ε^{3}i	ε^{6}i	ε^{2}i	ε^{5}i	εi	ε^{4}i
-1	$-\varepsilon^{4}$	$-\varepsilon$	$-\varepsilon^{5}$	$-\varepsilon^{2}$	$-\varepsilon^{6}$	$-\varepsilon^{3}$	$\cdots$	-1	$-\varepsilon^{4}$	$-\varepsilon$	$-\varepsilon^{5}$	$-\varepsilon^{2}$	$-\varepsilon^{6}$	$-\varepsilon^{3}$	-i	$-\varepsilon^{4}$i	$-\varepsilon$i	$-\varepsilon^{5}$i	$-\varepsilon^{2}$i	$-\varepsilon^{6}$i	$-\varepsilon^{3}$i	i	ε^{4}i	εi	ε^{5}i	ε^{2}i	ε^{6}i	ε^{3}i
-1	$-\varepsilon^{5}$	$-\varepsilon^{3}$	$-\varepsilon$	$-\varepsilon^{6}$	$-\varepsilon^{4}$	$-\varepsilon^{2}$	$\cdots$	-1	$-\varepsilon^{5}$	$-\varepsilon^{3}$	$-\varepsilon$	$-\varepsilon^{6}$	$-\varepsilon^{4}$	$-\varepsilon^{2}$	-i	$-\varepsilon^{5}$i	$-\varepsilon^{3}$i	$-\varepsilon$i	$-\varepsilon^{6}$i	$-\varepsilon^{4}$i	$-\varepsilon^{2}$i	i	ε^{5}i	ε^{3}i	εi	ε^{6}i	ε^{4}i	ε^{2}i
-1	$-\varepsilon^{6}$	$-\varepsilon^{5}$	$-\varepsilon^{4}$	$-\varepsilon^{3}$	$-\varepsilon^{2}$	$-\varepsilon^{1}$	$\cdots$	-1	$-\varepsilon^{6}$	$-\varepsilon^{5}$	$-\varepsilon^{4}$	$-\varepsilon^{3}$	$-\varepsilon^{2}$	$-\varepsilon^{1}$	-i	$-\varepsilon^{6}$i	$-\varepsilon^{5}$i	$-\varepsilon^{4}$i	$-\varepsilon^{3}$i	$-\varepsilon^{2}$i	$-\varepsilon^{1}$i	i	ε^{6}i	ε^{5}i	ε^{4}i	ε^{3}i	ε^{2}i	ε^{1}i

Table(7)

The characters table of matrix from degree 7(n+3) × 7(n+3) where $\varepsilon = e^{2\pi i/2n}$, $\varepsilon^{n} = -1$

4.2 Theorem:

The rational valued characters table of the group $Q_{2n}\times C_7$ when n is a prime number is given as follows:

$\equiv^*(Q_{2n}\times C_7) = \equiv^*(Q_{2n}) \otimes \equiv^*(C_7)$

Proof :

Since $C_7 = \{1,x,x^2, x^3, x^4, x^5, x^6\}$

Each element in $Q_{2n}\times C_7$ are $g_{qc} = g_q . g_c \ \forall g_c \in C_7$, $c \in \{1,x,x^2, x^3, x^4, x^5, x^6\}$

And each irreducible character $\lambda_{(i,j)}$ of $Q_{2n}\times C_7$ is can be written as follows

$$\lambda_{(i,j)} = \lambda_i . \lambda_j^{'}$$

Where λ_i is an irreducible character of Q_{2n} and $\lambda_j^{'}$ is the irreducible character of C_7 ,then

$$\lambda_{(i,j)}(q,c) = \lambda_i(g) . \lambda_j^{'}(c) = \begin{cases} \lambda i(g_q) & \text{if } j = 1 \text{ for all c} \\ 6\lambda i(g_q) & \text{if } j = 2,3,4,5,6,7 \text{and } c = 1 \\ -\lambda i(g_q) & \text{if } j = 2,3,4,5,6,7 \text{ and } c \neq 1 \end{cases}$$

From proposition (3.1.4)

$$\vartheta_{(i,j)} = \sum_{\sigma \epsilon Gal(Q(\lambda_{(i,j)})/Q)} \sigma(\lambda_{(i,j)})$$

Where $\vartheta_{(i,j)}$ is the rational valued character of $Q_{2n}\times C_7$

Then , $\vartheta_{(i,j)}(g_{qc}) = \sum_{\sigma \epsilon Gal(Q(\lambda_{(i,j)}(g_{qc}))/Q)} \sigma(\lambda_i (g_q). \lambda'_i (g_c))$

(I) If j=1 and $c \in C_7$

$\vartheta_{(i,j)}(g_{qc}) = \sum_{\sigma \epsilon Gal(Q(\lambda_i(g_q))/Q)} \sigma(\lambda_i (g_q)) . \lambda'_i (g_c)) = \vartheta_i(g_q).1 = \vartheta_i(g_q). \vartheta'_j(1)$

Where ϑ_i is the rational valued character of Q_{2n} .

(II) (a) if j = 2,3,4,5,6,7 and c = 1

$\vartheta_{(i,j)}(g_{qc}) = \sum_{\sigma \epsilon Gal(Q(\lambda_i(g_q))/Q)} \sigma(\lambda_i (g_q). \lambda'_j(1)) = \sum_{\sigma \epsilon Gal(Q(\lambda_i(g_q))/Q)} \sigma(\lambda_i(g_q). [\sum \sigma \lambda'_j(1)])$

$= \sum_{\sigma \epsilon Gal(Q(\lambda_i(g_q))/Q)} \sigma(\lambda_i(g_q). [1+1+1+1+1+1]) = \vartheta_i(g_q).6 = \vartheta_i(g_q). \vartheta'_j(1)$

(b) if j=2,3,4,5,6,7 and $c \neq 1$

$\vartheta_{(i,j)}(g_{qc}) = \sum_{\sigma \epsilon Gal(Q(\lambda_i(g_q))/Q)} \sigma(\lambda_i (g_q). [\sum \sigma \lambda'_j(c)])$

$= \sum_{\sigma \epsilon Gal(Q(\lambda_i(g_q))/Q)} \sigma(\lambda_i (g_q). [\epsilon + \epsilon^2 + \epsilon^3 + \epsilon^4 + \epsilon^5 + \epsilon^6])$

$= -\sum_{\sigma \epsilon Gal(Q(\lambda_i(g_q))/Q)} \sigma(\lambda_i (g_q). -1 = \vartheta_i(g_q). \vartheta_j(g_c)$

From [I],[II] we have

$$\vartheta_{(i,j)} = \vartheta_i . \vartheta_j^{'}$$

Then $\equiv^*(Q_{2n}\times C_7) = \equiv^*(Q_{2n}) \otimes \equiv^*(C_7)$.

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Example(4.3):

To find the rational valued characters table of $Q_{26}\times C7$, we can use theorem (4.2) .

By proposition(3.1.5) we have:

$\equiv^*(Q_{26})=$

Γ-classes	[1]	[x^2]	[x^{13}]	[x]	[y]
ϑ_1	1	1	1	1	1
ϑ_2	12	-1	12	-1	0
ϑ_3	1	1	1	1	-1
ϑ_4	12	-1	-12	1	0
ϑ_5	2	2	-2	-2	0

Table(8)

And by Proposition(3.1.7) we have :

$\equiv^*(C_7) =$

Γ-classes	[1]	[x]
ϑ_1	6	-1
ϑ_2	1	1

Table(9)

$\equiv^*(Q_{26}\times C_7) =$

Γ-classes	[1,I]	[1,s]	[x^2,I]	[x^2,s]	[x^{13},I]	[x^{13},s]	[x,I]	[x,s]	[y,I]	[y,s]
$\lvert CL_\alpha \rvert$	1	1	2	2	1	1	2	2	13	13
$\vartheta_{(1,1)}$	1	1	1	1	1	1	1	1	1	1
$\vartheta_{(1,2)}$	6	-1	6	-1	6	-1	6	-1	6	-1
$\vartheta_{(2,1)}$	12	12	-1	-1	12	12	-1	-1	0	0
$\vartheta_{(2,2)}$	72	-12	-6	1	72	-12	-6	1	0	0
$\vartheta_{(3,1)}$	1	1	1	1	1	1	1	1	-1	-1
$\vartheta_{(3,2)}$	6	-1	6	-1	6	-1	6	-1	-6	1
$\vartheta_{(4,1)}$	12	12	-1	-1	-12	-12	1	1	0	0
$\vartheta_{(4,2)}$	72	-12	-6	1	-72	12	6	-1	0	0
$\vartheta_{(5,1)}$	2	2	2	2	-2	-2	-2	-2	0	0
$\vartheta_{(5,2)}$	12	-2	12	-2	-12	2	-12	2	0	0

Table(10)

Conclusion:

In this paper we discussed the characters table of the group ($Q_{2n}\times C_7$) and the rational valued characters table of the group $Q_{2n}\times C_7$ when n is an odd number.

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