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On Artin cokernel of The Group(Q_{2m}×D_3) Where m= $2p_1p_2$ and p_1,p_2 are prime numbers

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Abstract:

The main purpose of This paper is to find Artin's character table ***Ar(Q_{2m}×D_3)****when m is even number such that m =2p,and p is a prime number; where Q_{2m} is denoted to Quaternion group of order 4m, time is said to have only one dimension and space to have three dimension, the mathematical quaternion partakes of both these elements; in technical language it may be said to be "time plus space", or "space plus time" and in this sense it has, or at least involves a reference to four dimensions, and how the one of time of space the three might in the chain of symbols girdled"- William Rowan Hamilton (Quoted in Robert Percival Graves "Life of sir William Rowan Hamilton" (3 vols., 1882, 1885, 1889)), and* ***D_3*** *is Dihedral group of order 6. In 1962, C.W.Curits & I. Reiner studied Representation Theory of finite groups.*

In 1976, I.M.Isaacs studied Characters Theory of finite groups, In 1982 , M.S.Kirdar studied The Factor Group of the Z-Valued class function modulo the group of the Generalized Characters. In 1994 H. H. Abass studies The Factor Group of class function over the group of Generalized Characters of D_n and found $\equiv^*(D_n)$. In 1995, N. R.

Mahmood studies The Cyclic Decomposition of the factor Group cf(Q_{2m},Z)/ $\bar{R}$(Q_{2m}). In 2002, K-Sekiguchi studies Extensions and the Irreducibilies of the Induced Characters of Cyclic P-Group. In 2006, A.S.Abid studies Characters Table of Dihedral Group for Odd number.

Key words: even number, prime number, Quaternion group, and Dihedral group.

1. INTRODUCTION:

Representation Theory is a branch of mathematics that studies abstract algebra structures by Representing their elements as linear transformations of vector spaces, a representation makes an abstract algebraic object more concrete by describing its elements by matrices and the algebraic operations in items of matrix addition and matrix multiplication ,In which elements of a group are represented by invertible matrices in such a way that the group operation is matrix multiplication, Moreover, representation and character theory provide applications, no only in other branches of mathematics but also in physics and chemistry.

For a finite group G, the factor group **$\bar{R}$(G)/T(G)** is called the Artin cokernel of **G** denoted **AC(G)**, **$\bar{R}$(G)**denoted the a belian group generated by Z-valued characters of G under the operation of pointwise addition**, T(G)** is a subgroup of **$\bar{R}$(G)** which is generated by Artin's characters.

2. PRELIMINARS:[1]:(3,1)

The Generalized Quaternion Group Q_{2m}:

For each positive integer m≥2 ,The generalized Quaternion Group **Q_{2m}** of order 4m with two generators x and y satisfies **Q_{2m}** $=\{x^h y^k, 0\leq h\leq 2m-1, k=0,1\}$

Which has the following properties $\{x^{2m}=y^4=I, yx^my^{-1}=x^{-m}\}$.

Definition :[2](3,2)

Let **G** be a finite group, all the characters of group **G** induced from a principal character of cyclic subgroup of **G** are called Artin characters of **G**.

Artin characters of the finite group can be displayed in a table called Artin characters table of **G** which is denoted by **Ar(G);** The first row is Γ-conjugate classes ; The second row is The number of elements in each conjugate class, The third row is the size of the centralized $|C_G(cl_a)|$ and other rows contains the values of Artin characters .

Theorem:[5]:(3,3)

The general form of Artin characters table of $\mathbf{Cp^s}$

When p is a prime number and s is a positive integer number is given by :-

$\mathbf{Ar(Cp^s)}$=

Γ-classes	[1]	$[x^{ps-1}]$	$[x^{ps-2}]$	…	[x]
$\|cl_a\|$	1	1	1	…	1
$\|cp^s(cl_a)\|$	p^s	ps	p^s	…	p^s
Φ_1	p^s	0	0	…	0
Φ_2	P^{s-1}	P^{s-1}	0	…	0
⋮	⋮	⋮	⋮	…	⋮
Φ_s	p	p	p	…	0
Φ_{s+1}	1	1	1	…	1

Table (1)

Corollary:[5]:(3,4)

Let $n=P_1^{a1}.P_2^{a2}\ldots P_n^{an}$ where $g.c.d(P_i,P_j)=1$ if $i\neq j$ and P_i are a prime numbers, and a_i any positive integer for all $1\le i\le n$ Then :

$\mathbf{Ar(C_m)=Ar(Cp_1^{a1})\otimes Ar(Cp_2^{a2})\ldots\otimes Ar(Cp_n^{an})}$ such that

$\mathbf{Ar(Cp^1)}$=

Γ-class	[1]	[x]
$\|cl_a\|$	1	1
$\|cp(cl_a)\|$	p	p
Φ_1	p	0
Φ_2	1	1

Table (2)

Where **$Ar(C_{2m})$,m=2.p is $Ar(C_{2.2p})$= $Ar(C_{2^2}p)$= $Ar(C_{2^2})\otimes Ar(p^1)$.**

Proposition:[4]:(3,5)

The number of all distinct Artin characters on group G is equal to the number of Γ-classes on **G** .Furthermore, Artin characters are constant on each Γ-classes .

3. THE MAIN RESULTS:

Theorem:(4,1):- *The Artin׳s character table of the group* ***($Q_{4p1p2}\times D_3$)*** *where $m=2p_1p_2$ such that p_1,p_2 are prime numbers is given as follows:*

$Ar(Q_{4p1p2}\times D_3)$=

The Artin׳s character table of matrix from degree 42×42 of group ***($Q_{4p1p2}\times D_3$)*** *:*

	Γ-classes of $Q_{2p1p2}\times\{1\}$													
Γ-classes	$[1,1]$	$[x^{2p1p2},1]$	$[x^{p1p2},1]$	$[x^{4p2},1]$	$[x^{2p2},1]$	$[x^{p2},1]$	$[x^{4p1},1]$	$[x^{2p1},1]$	$[x^{p1},1]$	$[x^4,1]$	$[x^2,1]$	$[x,1]$	$[y,1]$	$[xy,1]$
$\lvert CL_\alpha\rvert$	1	1	2	2	2	2	2	2	2	2	2	2	$4p_1p_2$	$4p_1p_2$
$\lvert CQ_{2p1p2\times D3}(CL_\alpha)\rvert$	$24.2p_1p_2$	$24.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	24	24
Φ(1,1) Φ(2,1) Φ(3,1) Φ(4,1) Φ(5,1) Φ(6,1) Φ(7,1) Φ(8,1) Φ(9,1) Φ(10,1) Φ(11,1) Φ(12,1) Φ(13,1) Φ(14,1)	$6Ar(Q_{2.2p1p2})$													

	Γ-classes of $Q_{2p1p2}\times\{r\}$													
Γ-classes	$[1,r]$	$[x^{2p1p2},r]$	$[x^{p1p2},r]$	$[x^{4p2},r]$	$[x^{2p2},r]$	$[x^{p2},r]$	$[x^{4p1},r]$	$[x^{2p1},r]$	$[x^{p1},r]$	$[x^4,r]$	$[x^2,r]$	$[x,r]$	$[y,r]$	$[xy,r]$
$\lvert CL_\alpha\rvert$	2	2	4	4	4	4	4	4	4	4	4	4	$8p_1p_2$	$8p_1p_2$
$\lvert CQ_{2p1p2\times D3}(CL_\alpha)\rvert$	$12.2p_1p_2$	$12.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.p_1p_2$	24	24
Φ(1,1) Φ(2,1) Φ(3,1) Φ(4,1) Φ(5,1) Φ(6,1) Φ(7,1) Φ(8,1) Φ(9,1) Φ(10,1) Φ(11,1) Φ(12,1) Φ(13,1) Φ(14,1)	0													

	Γ-classes of $Q_{2p1p2} \times \{s\}$													
Γ-classes	$[I,s]$	$[x^{2p1p2},s]$	$[x^{p1p2},s]$	$[x^{4p2},s]$	$[x^{2p2},s]$	$[x^{p2},s]$	$[x^{4p1},s]$	$[x^{2p1},s]$	$[x^{p1},s]$	$[x^{4},s]$	$[x^{2},s]$	$[x,s]$	$[y,s]$	$[xy,s]$
$\lvert CL_\alpha \rvert$	3	3	6	6	6	6	6	6	6	6	6	6	$8p_1p_2$	$8p_1p_2$
$\lvert CQ_{2p1p2\times D3}(CL_\alpha)\rvert$	$8.2p_1p_2$	$8.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	8	8
$\Phi(I,1)$ $\Phi(2,1)$ $\Phi(3,1)$ $\Phi(4,1)$ $\Phi(5,1)$ $\Phi(6,1)$ $\Phi(7,1)$ $\Phi(8,1)$ $\Phi(9,1)$ $\Phi(10,1)$ $\Phi(11,1)$ $\Phi(12,1)$ $\Phi(13,1)$ $\Phi(14,1)$	0													

	Γ-classes of $Q_{2p1p2} \times \{1\}$													
Γ-classes	$[I,1]$	$[x^{2p1p2},1]$	$[x^{p1p2},1]$	$[x^{4p2},1]$	$[x^{2p2},1]$	$[x^{p2},1]$	$[x^{4p1},1]$	$[x^{2p1},1]$	$[x^{p1},1]$	$[x^{4},1]$	$[x^{2},1]$	$[x,1]$	$[y,1]$	$[xy,]$
$\lvert CL_\alpha \rvert$	1	1	2	2	2	2	2	2	2	2	2	2	$4p_1p_2$	$4p_1p_2$
$\lvert CQ_{2p1p2\times D3}(CL_\alpha)\rvert$	$24.2p_1p_2$ 24	$24.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	24	
$\Phi(I,2)$ $\Phi(2,2)$ $\Phi(3,2)$ $\Phi(4,2)$ $\Phi(5,2)$ $\Phi(6,2)$ $\Phi(7,2)$ $\Phi(8,2)$ $\Phi(9,2)$ $\Phi(10,2)$ $\Phi(11,2)$ $\Phi(12,2)$ $\Phi(13,2)$ $\Phi(14,2)$	$2Ar(Q_{2.2p1p2})$													

	Γ-classes of $Q_{2p1p2} \times \{r\}$													
Γ-classes	$[I,1]$	$[x^{2p1p2},1]$	$[x^{p1p2},1]$	$[x^{4p2},1]$	$[x^{2p2},1]$	$[x^{p2},1]$	$[x^{4p1},1]$	$[x^{2p1},1]$	$[x^{p1},1]$	$[x^{4},1]$	$[x^{2},1]$	$[x,1]$	$[y,1]$	$[xy,1]$
$\lvert CL_\alpha \rvert$	2	2	4	4	4	4	4	4	4	4	4	4	$8p_1p_2$	$8p_1p_2$
$\lvert CQ_{2p1p2\times D3}(CL_\alpha)\rvert$	$12.2p_1p_2$ 24	$12.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.p_1p_2$	24
$\Phi(I,2)$ $\Phi(2,2)$ $\Phi(3,2)$ $\Phi(4,2)$ $\Phi(5,2)$ $\Phi(6,2)$ $\Phi(7,2)$ $\Phi(8,2)$ $\Phi(9,2)$ $\Phi(10,2)$ $\Phi(11,2)$ $\Phi(12,2)$ $\Phi(13,2)$ $\Phi(14,2)$	$2Ar(Q_{2.2p1p2})$													

	Γ-classes of $Q_{2p1p2} \times \{s\}$													
Γ-classes	$[I,s]$	$[x^{2p1p2},s]$	$[x^{p1p2},s]$	$[x^{4p2},s]$	$[x^{2p2},s]$	$[x^{p2},s]$	$[x^{4p1},s]$	$[x^{2p1},s]$	$[x^{p1},s]$	$[x^{4},s]$	$[x^{2},s]$	$[x,s]$	$[y,s]$	$[xy,s]$
$\lvert CL_\alpha \rvert$	3	3	6	6	6	6	6	6	6	6	6	6	$8p_1p_2$	$8p_1p_2$
$\lvert CQ_{2p1p2\times D3}(CL_\alpha)\rvert$	$8.2p_1p_2$	$8.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	8	8
$\Phi(I,2)$ $\Phi(2,2)$ $\Phi(3,2)$ $\Phi(4,2)$ $\Phi(5,2)$ $\Phi(6,2)$ $\Phi(7,2)$ $\Phi(8,2)$ $\Phi(9,2)$ $\Phi(10,2)$ $\Phi(11,2)$ $\Phi(12,2)$ $\Phi(13,2)$ $\Phi(14,2)$	0													

	Γ-classes of $Q_{2p1p2} \times \{1\}$													
Γ-classes	$[I,1]$	$[x^{2p1p2},1]$	$[x^{p1p2},1]$	$[x^{4p2},1]$	$[x^{2p2},1]$	$[x^{p2},1]$	$[x^{4p1},1]$	$[x^{2p1},1]$	$[x^{p1},1]$	$[x^{4},1]$	$[x^{2},1]$	$[x,1]$	$[y,1]$	$[xy,1]$
$\lvert CL_\alpha \rvert$	1	1	2	2	2	2	2	2	2	2	2	2	$4p_1p_2$	$4p_1p_2$
$\lvert CQ_{2p1p2\times D3}(CL_\alpha)\rvert$	$24.2p_1p_2$ 24	$24.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	$12.2p_1p_2$	24	
$\Phi(I,3)$ $\Phi(2,3)$ $\Phi(3,3)$ $\Phi(4,3)$ $\Phi(5,3)$ $\Phi(6,3)$ $\Phi(7,3)$ $\Phi(8,3)$ $\Phi(9,3)$ $\Phi(10,3)$ $\Phi(11,3)$ $\Phi(12,3)$ $\Phi(13,3)$ $\Phi(14,3)$	$3Ar(Q_{2.2p1p2})$													

	Γ-classes of $Q_{2p1p2}\times\{r\}$													
Γ-classes	$[I,1]$	$[x^{2p1p2},1]$	$[x^{p1p2},1]$	$[x^{4p2},1]$	$[x^{2p2},1]$	$[x^{p2},1]$	$[x^{4p1},1]$	$[x^{2p1},1]$	$[x^{p1},1]$	$[x^4,1]$	$[x^2,1]$	$[x,1]$	$[y,1]$	$[xy,1]$
$\|CL_\alpha\|$	2	2	4	4	4	4	4	4	4	4	4	4	$8p_1p_2$	$8p_1p_2$
$\|CQ_{2p1p2\times D3}(CL_\alpha)\|$	$12.2p_1p_2$	$12.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	$6.2p_1p_2$	24	24
Φ(1,3)														
Φ(2,3)														
Φ(3,3)														
Φ(4,3)														
Φ(5,3)														
Φ(6,3)														
Φ(7,3)														
Φ(8,3)														
Φ(9,3)								**0**						
Φ(10,3)														
Φ(11,3)														
Φ(12,3)														
Φ(13,3)														
Φ(14,3)														

	Γ-classes of $Q_{2p1p2}\times\{s\}$													
Γ-classes	$[I,s]$	$[x^{2p1p2},s]$	$[x^{p1p2},s]$	$[x^{4p2},s]$	$[x^{2p2},s]$	$[x^{p2},s]$	$[x^{4p1},s]$	$[x^{2p1},s]$	$[x^{p1},s]$	$[x^4,s]$	$[x^2,s]$	$[x,s]$	$[y,s]$	$[xy,]$
$\|CL_\alpha\|$	3	3	6	6	6	6	6	6	6	6	6	6	$8p_1p_2$	$8p_1p_2$
$\|CQ_{2p1p2\times D3}(CL_\alpha)\|$	$8.2p_1p_2$	$8.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	$4.2p_1p_2$	8	8
Φ(1,3)														
Φ(2,3)														
Φ(3,3)														
Φ(4,3)														
Φ(5,3)														
Φ(6,3)								$Ar(Q_{2.2p1p2})$						
Φ(7,3)														
Φ(8,3)														
Φ(9,3)														
Φ(10,3)														
Φ(11,3)														
Φ(12,3)														
Φ(13,3)														
Φ(14,3)														

Table 3

<u>Proof:</u>

Let $g_{ij}=(qi,dj)\ ;qi\in Q_{4p1p2}\ ,dj\in D_3$

Case (I):-

Consider the group $\boldsymbol{G=(Q_{4p1p2}\times D_3)}$ *and if H is a cyclic subgroup of* $\boldsymbol{(Q_{4p1p2}\times\{I\})}$ *then* $H=\langle(q,1)\rangle$ *and* Φ *the principle character of H and* Φ_j *Artin's characters of* $\boldsymbol{Q_{4p1p2}}$ *,* $1\leq j\leq i+2$ *,The cyclic subgroup of* $\boldsymbol{Q_{4p1p2}}$ *which are* $\{\langle I\rangle\},\{\langle x^{2p1p2}\rangle\},\{\langle x^{p1p2}\rangle\},\{\langle x^{4p2}\rangle\},\{\langle x^{2p2}\rangle\},\{\langle x^{p2}\rangle\}\{x^{4p1}\rangle\},\{\langle x^{2p1}\rangle\},$ $\{\langle x^{p1}\rangle\},\{\langle x^4\rangle\},\{\langle x^2\rangle\},\{\langle x\rangle\},\{\langle y\rangle\}\{\langle xy\rangle\}$ *and cyclic subgroup of* $\boldsymbol{D_3}$ *which are* $\{\langle I\rangle\},\{\langle r\rangle\},\{\langle s\rangle\}$*, by using theorem:*

$$\emptyset_j(g)=\begin{cases}\dfrac{|CG(g)|}{|CH(g)|}\sum_{i=1}^{n}\emptyset(hi) & if\ hi\in H\cap cl(g)\\ 0 & if\ H\cap cl(g)=\emptyset\end{cases}$$

H=<q,1>:-

1:- $H_{11}=\langle(I,1)\rangle$ *if* $g=(I,1)$ *then* $\emptyset_{11}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset\ (g)=\frac{24.2p1p2}{|CH(g)|}.1=\frac{6|CQ4p(1)|}{|C\langle x\rangle(1)|}.1=6.\emptyset_j(1)$

since $H\cap cl(I,1)=(I,1)$.

2:- $H_{21}=\langle(x^{2p1p2},1\rangle)$ *; (a)if* $g=(I,1)$*then*$\emptyset_{21}\ (g)=\frac{|CG(g)|}{|CH(g)|}\ \emptyset(g)=$ $=\frac{24.2p1p2}{|CH(g)|}.1=\frac{6|CQ4p1p2(1)}{|C\langle x\rangle(x2p1p2)|}\ .1$

$=6\emptyset_j(I)$.

(b)if $g=(x^{2p1p2},1)$ then $\emptyset_{21}(g)=\frac{|CG(g)|}{|CH(g)|}.\emptyset(g) = \frac{24.2p1p2}{|CH(g)|}$ $.1=\frac{24.2p1p2}{|C<x>(x^{2p1p2})|}.1=\frac{6|CQ4p(x^{2p1p2})|}{|C<x>(x^{2p1p2})|}.1=$
$=6.\emptyset_j(x^{2p1p2})$ since $H\cap cl(x^{2p1p2}) =(I,1),(x^{2p1p2},1)$ otherwise=0.

3:-H_{31} $=< (x^{p1p2},1) >$;(a) if g=(I,1) then $\emptyset_{31}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)$ $=\frac{24.2p1p2}{|CH(g)|}.1 =$
$=\frac{6|CQ4p1p2(g)|}{|C<x>(x^{p1p2})}.1=\frac{6|CQ4p1p2|}{|C<x>(x^{p1p2})|}.1=6\emptyset_j$ (I)

(b) if $g=(x^{2p1p2},1)$ then $\emptyset_{31}(g)=(x^{2p1p2},1) = \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{p1p2})|}.1=6\emptyset_j(x^{2p1p2})$

(c)if $g=(x^{p1p2},1)$ then $\emptyset_{31}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x^{p1p2})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{p1p2})|}.2=6.\emptyset j(x^{p1p2})$
Since $H\cap cl(x^{p1p2}) = \{(I,1),(x^{2p1p2},1),(x^{p1p2},1)\}$ otherwise=0.

4:-$H_{41}$$=< (x^{4p2},1) >$; (a) if g=(I,1) then $\emptyset_{41}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{4p2})|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^{4p2})|}.1 = 6\emptyset_j(I)$.

.(b) if $g=(x^{4p2},1)$ then $\emptyset_{41}(g)=$ $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x4p2)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{4p2})|}.2=$ 6 $\emptyset_j(x^{4p2})$
Since $H\cap cl(x^{4p2})=\{(I,1),(x^{4p2},1)\}$. Otherwise=0 and $\emptyset(g) = \emptyset(g^{-1})=1$.

5:-$H_{51}$$=< (x^{2p2},1) >$;(a) if g=(I,1) then $\emptyset_{51}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{2p2})|}.1=\frac{6|CQ4p(q)|}{|Cx>(x^{2p2})|}.1=6\emptyset_j(I)$

(b) if $g=(x^{2p1p2},1)$ then $\emptyset_{51}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{2p2})|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^{2p2})|}.1=6\ \emptyset_j(x^{2p1p2})$.

(c) if $g=(x^{4p2},1)$then $\emptyset_{51}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^{2p2})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{2p2})|}.2=6\ \emptyset_j(x^{4p2})$.

(d) if $g=(x^{2p2},1)$ then $\emptyset_{51}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+(g^{-1}))=\frac{12.p1p2}{|C<x>(x^{2p2})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{2p2})|}.2=6\ \emptyset_j(x^{2p2})$.

Since $H\cap cl(x^{2p2})=\{(I,1),(x^{2p1p2},1),(x^{4p2},1),,(x^{2p2},1)\}$. Otherwise=0.and$\emptyset(g)=\emptyset(g^{-1})$.

6:-$H_{61}=<(x^{p2},1)>$; (a)if $g=(I,1)$ then $\emptyset_{61}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{p2})|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^{p2})|}.1=6\ \emptyset_j(I)$

(b) if $g=(x^{2p1p2},1)$ then $\emptyset_{61}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{p2})|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^{p2})|}.1=6.\emptyset_j(x^{2p1p2})$.

(c) if $g=(x^{p1p2},1)$ then $\emptyset_{61}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{p2})|}.2=6\emptyset_j(x^{p1p2}\ )$

(d) if $g=(x^{4p2},1)$ then $\emptyset_{61}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{p2})|}.2=6.\emptyset_j(x^{4p2})$.

(e) if $g=(x^{2p2},1)$ then $\emptyset_{61}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4P(q)|}{|c<X>(x^{p2})|}.2=6\ \emptyset_j(x^{2p2})$.

(F) If $g=(x^{p2},1)$ then $\emptyset_{61}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{p2})|}.2=6\ \emptyset_j(x^{p2})$.

Since
$H\cap cl(x^{p2})=$
$\{(I.1),(x^{2p1p2},1),(x^{p1p2},1),(x^{4p2},1),(x^{2p2},1),(x^{p2},1)\}$ $\emptyset(g)=\emptyset(g^{-1})=1$ otherwise =0.

7:-$H_{71}=<(x^{4p1},1)>$; (a)if $g=(I,1)$ then $\emptyset_{71}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{4p1})|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^{4p1})|}.1=6\ \emptyset_j(I)$

(b) if $g=(x^{4p1},1)$ then $\emptyset_{71}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^{4p1})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{4p1})|}.2=6\emptyset_j(x^{4p1})$.

Since $H\cap cl(x^{4p1})=\{(I,1),(x^{4p1},1)\}$. Otherwise=0 and $\emptyset(g)=\emptyset(g^{-1})=1$.

8:- $H_{81}=\langle(x^{2p1},1)\rangle$; (a)if $g=(I,1)$ then $\emptyset_{81}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{2p1})|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^{2p1})|}.1=6\,\emptyset_j(I)$

b) if $g=(x^{2p1p2},1)$ then $\emptyset_{81}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{2p1})|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^{2p1})|}.1=6\emptyset_j(x^{2p1p2})$.

(c)) if $g=(x^{4p1},1)$ then $\emptyset_{81}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^{2p1})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{2p1})|}.2=6\emptyset_j(x^{4p1})$.

(d) If $g=(x^{2p1},1)$ then $\emptyset_{81}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^{2p1})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{2p1})|}.2=6\,\emptyset_j(x^{2p1})$.

Since

$H\cap cl(x^{2p1})=\{(I,1),(x^{2p1p2},1),(x^{4p1},1),,(x^{2p1},1)\}$.

Otherwise=0.and$\emptyset(g)=\emptyset(g^{-1})$

. 9:- $H_{91}=\langle(x^{p1},1)\rangle$; (a)if $g=(I,1)$ then $\emptyset_{91}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{p1})|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^{p1})|}.1=6\,\emptyset_j(I)$

b) if $g=(x^{2p1p2},1)$ then $\emptyset_{91}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{p2})|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^{p2})|}.1=6.\emptyset_j(x^{2p1p2})$.

(c) if $g=(x^{p1p2},1)$ then $\emptyset_{91}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{p1})|}.2=6.\emptyset j(x^{p1p2})$

(d) if $g=(x^{4p1},1)$ then $\emptyset_{91}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{p1})|}.2=6\emptyset_j(x^{4p1})$

(e) If $g=(x^{2p1},1)$ then $\emptyset_{91}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{p1})|}.2=6\,\emptyset_j(x^{2p1})$

(f)) If $g=(x^{p1},1)$ then $\emptyset_{91}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{p1})|}.2=6\emptyset_j\,(x^{p1})$.

Since
$H\cap cl(x^{p1}) =$
$\{(I.1),(x^{2p1p2},1),(x^{p1p2},1),(x^{4p1},1),(x^{2p1},1),(x^{p1},1)\}$ $\emptyset(g) = \emptyset(g^{-1}) = 1$ *otherwise =0.*

10:- H_{101}=<(x^4,1)> ; (a)if g=(I,1) then $\emptyset_{101}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^4)|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^4)|}.1=6\ \emptyset_j(I)$.

(b)) if g=(x^{4p2},1) then $\emptyset_{101}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^4)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^4)|}.2=6.\emptyset_j(x^{4p2})$.

(c)) if g=(x^{4p1},1) then $\emptyset_{101}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x^4)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^4)|}.2=6.\emptyset_j(x^{4p1})$.

(d) if g=(x^4,1)) then $\emptyset_{101}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x^4)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^4)|}.2=6.\emptyset_j(x^4)$.

. *Since* $H\cap cl(x^4)=\{(I,1),(x^{4p2},1),(x^{4p1},1),,(x^4,1)\}$. *Otherwise=0.and* $\emptyset(g) = \emptyset(g^{-1})$

11:- H_{111}=<(x^2,1)> ; (a)if g=(I,1) then $\emptyset_{111}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^2)|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^2)|}.1=6\ \emptyset_j(I)$.

(b) if g=(x^{2p1p2},1) then $\emptyset_{111}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^2)|}.1=\frac{6|CQ4p(q)|}{|C<x>(x^2)|}.1=6.\emptyset_j(x^{2p1p2})$.

(c)) if g=(x^{4p2},1) then $\emptyset_{111}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^2)|}.2=6.\emptyset_j(x^{4p2})$.

(d) If g=(x^{2p2},1) then $\emptyset_{111}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^2)|}.2=$
$6\ \emptyset_j(x^{2p2})$.

(e) if g=(x^{4p1},1) then $\emptyset_{111}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^2)|}.2=6.\emptyset_j(x^{4p1})$.

(f) If $g=(x^{2p1},1)$ then $\emptyset_{111}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^2)|}.2=6\ \emptyset_j(x^{2p1})$

(g) if $g=(x^4,1)$) then $\emptyset_{111}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^2)|}.2=6.\emptyset_j(x^4)$.

(h) if $g=(x^2,1)$ then $\emptyset_{111}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=$
$\frac{12.2p1p2}{|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^2)|}.2=6.\emptyset_j(x^2)$.

Since
$H\cap cl(x^2)=$
$\{(I,1),(x^{2p1p2},1),(x^{4p2},1),(x^{2p2},1),(x^{4p1},1),(x^{2p1},1),(x^4,1),(x^2,1)\}$

$$Otherwise=0.and\emptyset(g)=\emptyset(g^{-1}).$$

12:-$H_{121}=\langle(x,1)\rangle$; (a)if $g=(I,1)$ then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x)|}.1=\frac{6|CQ4p(q)|}{|C<x>(x)|}.1=6.\ \emptyset_j(I)$.

b) if $g=(x^{2p1p2},1)$ then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x)|}.1=\frac{6|CQ4p(q)|}{|C<x>(x)|}.1=6.\emptyset j(x^{2p1p2})$.

(c) if $g=(x^{p1p2},1)$ then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x)|}.2=6\emptyset_j(x^{p1p2})$

(d) if $g=(x^{4p2},1)$ then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x)|}.2=6.\emptyset_j(x^{4p2})$.

(e) if $g=(x^{2p2},1)$ then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x)|}(1+1)=\frac{3|CQ4P(q)|}{|c<X>(x)|}.2=6\ \emptyset_j(x^{2p2})$.

(F) If $g=(x^{p2},1)$ then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x)|}.2=6\ \emptyset_j(x^{p2})$.

(g) if $g=(x^{4p1},1)$ then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x)|}.2=6.\emptyset_j(x^{4p1})$.

(h) If $g=(x^{2p1},1)$ then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x)|}.2=$
$6\,\emptyset_j(x^{2p1})$

(i) If $g=(x^{p1},1)$ then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x^{p1})|}.2=$
$6\,\emptyset_j(x^{p1})$.

(j) if $g=(x^4,1)$) then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x)|}.2=6.\emptyset_j(x^4)$
.

(k) if $g=(x^2,1)$ then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x)|}.2=6.\emptyset_j(x^2)$
.

(l) if $g=(x,1)$) then $\emptyset_{121}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{|C<x>(x)|}.2=6.\emptyset_j(x)$.

Since
$H\cap cl(x)=$
$\left\{\begin{matrix}(I,1),(x^{2p1p2},1),(x^{p1p2},1),(x^{4p2},1),(x^{2p2},1),(x^{p2},1),(x^{4p1},1),(x^{2p1},1),(x^{p1},1),(x^4,1),\\(x^2,1),(x,1)\end{matrix}\right\}$
Otherwise=0.and$\emptyset(g)=\emptyset(g^{-1})$.

13:-H_{131}=<(y,1)> ;(a) if g=(I,1) then$\emptyset_{131}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{4}.1=6\,\emptyset_{i+1}(I)$.

(b) if $g=(y^2,1)=(x^{2p},1)$then$\emptyset_{131}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{4}.1=6$
$\emptyset_{i+1}(x^{2p1p2})$.

(c) if g=(y,1) or $(y^3,1)$ then $\emptyset_{131}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{24}{4}(1+1)=6.2=12.$

Since $H\cap cl(g)=\{(I,1),(y^2,1),(y,1)\}$ and $\emptyset(g)=\emptyset(g^{-1})$otherwise =0.

14:-H_{141}=<(xy,1)> ; (a) if g=(I,1) then $\emptyset_{141}(g)=\frac{|CG(G)|}{|cH(g)|}\emptyset(g)=\frac{24.2p1p2}{4}.1=$
$6\,\emptyset_{i+2}(I)$.

(b) if $g=((xy)^2,1)=(x^{2p},1)$ *then* $\emptyset_{141(g)}=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{4}.1=$ $6\ \emptyset_{i+2}(x^{2p1p2})$.

(c) if $g=(xy,1)$ *or* $((xy)^3,1)$ *then* $\emptyset_{141}(g)=|\ \frac{|CG(g)|}{|CH(g)|}\left(\emptyset(g)+\emptyset(g^{-1})\right)=$ $\frac{24}{4}(1+1)=6.2=12.$

Since $H\cap cl(xy)=\{(I,1),(xy^2,1),(xy,1)\}$ *and* $\emptyset(g)=\emptyset(g^{-1})=1$

Case (II):-

Consider the group $\boldsymbol{G=(Q_{4p1p2}\times D_3)}$ *and if H is a cyclic subgroup of* $\boldsymbol{(Q_{4p1p2}\times\{r\})}$ *then* $H=\langle(q,r)\rangle$ *and* $\emptyset$ *the principle character of H and* $\emptyset j$ *Artin's character of* $\boldsymbol{Q_{4p1p2}}$ *,* $1\leq j\leq i+2$ *,by using theorem:-*

$$\emptyset_j(g)=\begin{cases}\frac{|CG(g)|}{|CH(g)|}\sum_{i=1}^{n}\emptyset(hi) & if\ hi\in H\cap cl(g)\\ 0 & if\ H\cap cl(g)=\emptyset\end{cases}$$

$H=\langle(q,r)$

1:- $H_{12}=\langle(I,r)\rangle$ (a) if $g=(I,1)$ then $\emptyset_{12}=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=$ $\frac{24.2p1p2}{|c\langle x\rangle(1)|}.1=\frac{6|CQ4p(1)|}{3|C\langle x\rangle(1)|}.1=2.\emptyset_j(1)$

(b) If $g=(I,r)$ or $=(I,r^2)$ then $\emptyset_{12}(g)=$ $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C\langle x\rangle(1)|}(1+1)=\frac{3|CQ4p(1)|}{3|C\langle x\rangle(1)|}.2=2\emptyset_j(q)$

Since $H\cap cl(g)=\{(I,1),(I,r),(I,r^2)\}$ *and* $\emptyset(g)=\emptyset(g^{-1})=1$ *othrewise=0.*

2:- $H_{22}=\langle(x^{2p1p2},r)\rangle$ (a) if $g=(I,1)$ then $\emptyset_{22}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C\langle x\rangle(x^{2p1p2})|}(1)=\frac{6|CG4p(q)|}{3|C\langle x\rangle(x^{2p1p2})|}(1)=2.\emptyset_j(I)$

(b) if $g=(x^{2p1p2},1)$ then $\emptyset_{22}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C\langle x\rangle(x^{2p1p2})|}(1)=\frac{6|CQ4p(x^{2p1p2})|}{3|c\langle x\rangle(x^{2p1p2})|}(1)=2.\emptyset_j(x^{2p1p2})$.

(c) if $g=(I,r)$ then $\emptyset_{22}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C\langle x\rangle(q)|}(1+1)=\frac{3|CQ4p(q)|}{3|C\langle x\rangle(q)|}.2=2.\emptyset_j(q)$.

(d) if $g=(x^{2p1p2},r)$ then $\emptyset_{22}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C\langle x\rangle(q)|}(1+1)=\frac{3|CQ4p(q)|}{3|C\langle x\rangle(q)|}.2=2.\emptyset_j(q)$.

Since $H\cap cl(g)=\{(I,1),(x^{2p1p2},1),(I,r),(x^{2p1p2},r)\}.and \quad \emptyset(g)=\emptyset(g^{-1})=1.othrewise=0.$

3:-H₃₂ =<(x^{p1p2},r)> (a) if g=(I,1) then $\emptyset_{32}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{p1p2})|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x^{p1p2})|}.1=2.\emptyset_j(I).$

(b) if g=(x^{2p1p2},1) then $\emptyset_{32}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{p1p2})|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x^{p1p2})|}.1=2\emptyset_j(x^{2p1p2}).$

(c) if g=(x^{p1p2},1) then $\emptyset_{32}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p1p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p1p2})|}.2=2.\emptyset_j(x^{p1p2}).$

(d) if g=(I,r) then $\emptyset_{32}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p1p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p1p2})|}.2=2.\emptyset_j(q).$

(e) if g=(x^{2p1p2},r) then $\emptyset_{32}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{|C<x>(x^{p1p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p1p2})|}.2=2.\emptyset_j(q).$

(f) if g=(x^{p1p2},r) then $\emptyset_{32}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{p1p2})|}(1+1+1+1)=\frac{6.4(2p1p2)}{3|C<x>(x^{p1p2})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{p1p2})|}=2.\emptyset j(q).$ *since* $H\cap cl(g)=\{(I,1),(x^{2p1p2},1),(x^{p1p2},1),(I,r),(x^{2p1p2},r),(x^{p1p2},r)\}.and$ $\emptyset(g)=\emptyset((g^{-1})=1.othrewise=0.$

4:-H₄₂=<(x^{4p2},r)> (a) if g=(I,1) then $\emptyset_{42(g)}=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{4p2})|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x^{4p2})|}.1=2.\emptyset_j(I).$

(b) if g=(x^{4p2},1) then $\emptyset_{42(g)}=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{4p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{4p2})|}.2=2.\emptyset_j(x^{4p2}).$

(c) if g=(I,r) then $\emptyset_{42(g)}=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{4p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{4p2})|}.2=2.\emptyset_j(q).$

(d) if g=(x^{4p2},r) then $\emptyset_{42(g)}=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{4p2})|}(1+1+1+1)=\frac{6.4(2p)}{3|C<x>(x^{4p2})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{4p2})|}=2.\emptyset_j(q).$

since $H\cap$ *cl(g)*=$\{(I,1),(x^{4p2},1),(I,r),(x^{4p2},r)\}$*and* $\emptyset(g)=\emptyset((g^{-1})=1$.*othrewise=0.*

5:-$H_{52}=<(x^{2p2},r)>$ *(a) if g=(I,1) then* $\emptyset_{52}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{2p2})|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x^{2p2})|}.1=2.\emptyset_j(I)$.

(b) if g=$(x^{2p1p2},1)$ *then* $\emptyset_{52}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{2p2})|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x^{2p2})|}.1=2.\emptyset_j(x^{2p1p2})$.

(c) if g=$(x^{4p2},1)$ *then* $\emptyset_{52}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1})=\frac{12.2p1p2}{3|C<x>(x^{2p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{2p2})|}.2=2..\emptyset j(x^{4p2})$.

(d) if g=$(x^{2p2},1)$ *then* $\emptyset_{52}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{2p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{2p2})|}.2=2.\emptyset_j(x^{2p2})$.

(e) if g=(I,r) then $\emptyset_{52}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{2p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{2p2})|}.2=2..\emptyset_j(q)$.

(f) if g=(x^{2p1p2},r) *the*$\emptyset_{52}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{2p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{2p2})|}.2=2..\emptyset j(q)$.

(g) if g=(x^{4p2},r) *then* $\emptyset_{52}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{2p2})|}(1+1+1+1)=\frac{6.4(2p1p2)}{3|C<x>(x^{2p2})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{2p2})|}$
$=2.\emptyset_j(q)$.

(h) if g=(x^{2p2},r) *then*$\emptyset_{52}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{2p2})|}(1+1+1+1)=\frac{6.4(2p1p2)}{3|C<x>(x^{2p2})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{2p2})|}$
$=2.\emptyset_j(q)$. *since* $H\cap$ *cl(g)=*
$\{(I,1),(x^{2p1p2},1),(x^{4p2},1),(x^{2p2},1),(I,r),(x^{2p1p2},r),(x^{4p2},r),(x^{2p2},r)\}$
and $\emptyset(g)=\emptyset((g^{-1})=1$.*othrewise=0.*

6:-$H_{62}=<(x^{p2},r)>$ *(a) if g=(I,1) then* $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{p2})|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x^{p2})|}=2.\emptyset_j(I)$

(b) if g=$(x^{2p1p2},1)$*then* $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{p2})|}.1=\frac{6|CQ4p|}{3|C<x>(x^{p2})|}=2.\emptyset_j(x^{2p1p2})$.

(c) if $g=(x^{p1p2},1)$ then $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p2})|}.2=2.\emptyset_j(x^{p1p2})$

(d) if $g=(x^{4p2},1)$ then $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p2})|}.2=2.\emptyset_j(x^{4p2})$.

(e) if $g=(x^{2p2},1)$ then $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p2})|}.2=2\,\emptyset_j(x^{2p2})$.

(f) if $g=(x^{p2},1)$ then $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p2})|}.2=2.\emptyset_j(x^{p2})$.

(g) if $g=(I,r)$ then $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p2})|}.2=$
$2\,\emptyset_j(q)$.

(h) if $g=(x^{2p1p2},r)$ then $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p2})|}.2=2.\emptyset_j(q)$.

(i) if $g=(x^{p1p2},r)$ then $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{p2})|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^{p2})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{p2})|}$
$=2.\emptyset_j(q)$.

(j) if $g=(x^{4p2},r)$ then $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{p2})|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^{p2})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{p2})|}$
$=2.\emptyset_j(q)$.

(k) if $g=(x^{2p2},r)$ then $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{p2})|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^{p2})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{p2})|}$
$=2.\emptyset_j(q)$.

(l) *if* $g=(x^{p2},r)$ *then* $\emptyset_{62}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{p2})|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^{p2})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{p2})|}$ $=2.\ \emptyset_j(q)$.

Since

$H\cap cl(g)=\{(I,1),(x^{2p1p2},1),(x^{p1p2},1),(x^{4p2},1),(x^{2p2},1),(I,r),(x^{2p1p2},r),(x^{p1p2},r),(x^{4p2},r),(x^{2p2},r),\}$

And $\emptyset(g)=\emptyset(g^{-1})=1.othrewise=0.$

7:-H_{72}*=<(*x^{4p1}*,r)>,* *(a)* *if* $g=(I,1)$ *then* $\emptyset_{72}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{4p1})|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x^{4p1})|}=2\ .\emptyset_j(I)$

(b) *if* $g=(x^{4p1},1)$ *then* $\emptyset_{72}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{4p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{4p1})|}.2=\ 2\ .\emptyset_j(x^{4p1})$.

(c) *if* $g=(I,r)$ *then* $\emptyset_{72}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{4p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{4p1})|}.2=\ 2\ .\emptyset_j(q)$.

(d) *if* $g=(x^{4p1},r)$ *then* $\emptyset_{72}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{4p1})|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^{4p1})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{4p1})|}$

since $H\cap$ $cl(g)=\{(I,1),(x^{4p1},1),(I,r),(x^{4p1},r)\}$*and* $\emptyset(g)=\emptyset((g^{-1})=1.othrewise=0.$

8:-H_{82}*=<(*x^{2p1}*,r)>;* *(a)* *if* $g=(I,1)$ *then* $\emptyset_{82}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{2p1})|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x^{2p1})|}=2\ .\emptyset j(I)$

(b) *if* $g=(x^{2p1p2},1)$*then* $\emptyset_{82}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{2p1})|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x^{2p1})|}=2\ .\emptyset j(x^{2p1p2})$.

(c) *if* $g=(x^{4p1},1)$ *then* $\emptyset_{82}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{2p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{2p1})|}.2=2\ .\emptyset_j(x^{4p1})$

(d) *if* $g=(x^{2p1},1)$ *then* $\emptyset_{82}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{2p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{2p1})|}.2=2\ .\emptyset_j(x^{2p1})$.

(e) if g=(I,r) then $\emptyset_{82}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{2p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{2p1})|}.2=$ $2\,\emptyset_j(q)$.

(f) if g=(x^{2p1p2},r) then $\emptyset_{82}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{2p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{2p1})|}.2=$ $2\,.\emptyset_j(q)$.

(g) if g=(x^{4p1},r) then$\emptyset_{82}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{2p1})|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^{2p1})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{2p1})|}$ $.2=2\,.\emptyset_j(q)$

(h) if g=(x^{2p1},r) then$\emptyset_{82}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{2p1})|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^{2p1})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{2p1})|}$ $.2=2\,.\emptyset_j(q)$

Since

$H\cap cl(g)=$
$\{(I,1),(x^{2p1p2},1),(x^{4p1},1),(x^{2p1},1),(I,r),(x^{2p1p2},r),(x^{4p1},r),(x^{2p1},r)\}$

and

$\emptyset(g)=\emptyset((g^{-1})=1$.othrewise=0.

9:-H_{92}=<(x^{p1},r)> ; (a) if g=(I,1) then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{p1})|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x^{p1})|}=2\,.\emptyset_j(I)$

(b) if g=$(x^{2p1p2},1)$then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^{p1})|}.1=\frac{6|CQ4p|}{3|C<x>(x^{p1})|}=2\,.\emptyset j(x^{2p1p2})$.

(c) if g=$(x^{p1p2},1)$ then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p1})|}.2=2\,.\emptyset_j(x^{p1p2})$

$2\,.\emptyset j(x^{4p1})$ (d) if g=(x^{4p1},1) then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p1})|}.2=$

(e) if g=$(x^{2p1},1)$ then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p1})|}.2=2\,.\emptyset_j(x^{2p1})$.

(f) if $g=(x^{p1},1)$ then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p1})|}.2=2.\emptyset_j(x^{p1})$.

(g) if $g=(I,r)$ then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p1})|}.2=2.\emptyset_j(q)$.

(h) if $g=(x^{2p1p2},r)$ then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x^{p1})|}.2=2.\emptyset_j(q)$

(i) if $g=(x^{p1p2},r)$ then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{p1})|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^{p1})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{p1})|}$
$=2.\emptyset_j(q)$.

(j) if $g=(x^{4p1},r)$ then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{p1})|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^{p1})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{p1})|}$
$.2=2.\emptyset_j(q)$

(k) if $g=(x^{2p1},r)$ then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{p1})|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^{p1})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{p1})|}$
$.2=2.\emptyset_j(q)$

(l) if $g=(x^{p1},r)$ then then $\emptyset_{92}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^{p1})|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^{p1})|}=\frac{6|CQ4p(q)|}{3|C<x>(x^{p1})|}$
$.2=2.\emptyset_j(q)$

Since $H\cap cl(g)=$
$$\left\{\begin{matrix}(I,1),(x^{2p1p2},1),(x^{p1p2},1),(x^{4p1},1),(x^{2p1},1),(x^{p1},1),(I,r),(x^{2p1p2},r),(x^{p1p2},r),(x^{4p1},r),\\(x^{2p1},r),(x^{p1},r)\end{matrix}\right\}$$
And $\emptyset(g)=\emptyset(g^{-1})=1$.othrewise=0.

10:-H_{101}=<(x^4,r)>; (a) if $g=(I,1)$ then $\emptyset_{102}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x^4)|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x^4)|}=2.\emptyset_j(I)$

(b) *if* $g=(x^{4p2},1)$ *then* $\emptyset_{102}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C{<}x{>}(x^4)|}(1+1)=\frac{3|CQ4p(q)|}{3|C{<}x{>}(x^4)|}.2=2.\emptyset_j(x^{4p2})$ *(c)* *if* $g=(x^{4p1},1)$ *then* $\emptyset_{102}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C{<}x{>}(x^4)|}(1+1)=\frac{3|CQ4p(q)|}{3|C{<}x{>}(x^4)|}.2=2.\emptyset_j(x^{4p1})$

(d) *if* $g=(x^4,1)$ *then* $\emptyset_{102}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C{<}x{>}(x^4)|}(1+1)=\frac{3|CQ4p(q)|}{3|C{<}x{>}(x^4)|}.2=2.\emptyset_j(x^4)$

(e) *if* $g=(I,r)$ *then* $\emptyset_{102}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C{<}x{>}(x^4)|}(1+1)=\frac{3|CQ4p(q)|}{3|C{<}x{>}(x^4)|}.2=$
$2\,\emptyset_j(q)$.

(f) *if* $g=(x^{4p2},r)$ *then* $\emptyset_{102}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^4)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^4)|}=\frac{6|CQ4p(q)|}{3|C<x>(x^4)|}$
$.2=2\,.\emptyset_j(q)$.

(g) *if* $g=(x^{4p1},r)$ *then* $\emptyset_{102}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^4)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^4)|}=\frac{6|CQ4p(q)|}{3|C<x>(x^4)|}$
$.2=2\,.\emptyset_j(q)$.

(h) *if* $g=(x^4,r)$ *then* $\emptyset_{102}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^4)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^4)|}=\frac{6|CQ4p(q)|}{3|C<x>(x^4)|}$
$.2=2\,\emptyset_j(q)$.

Since
$H\cap cl(g)=$
$\{(I,1),(x^{4p2},1),(x^{4p1},1),(x^4,1),(I,r),(x^{4p2},r),(x^{4p1},r),(x^4,r)\}$
And $\emptyset(g)=\emptyset((g^{-1})=1$.*othrewise=0.*

11:- $H_{112}=<(x^2,r)>$; *(a)* *if* $g=(I,1)$ *then* $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C{<}x{>}(x^2)|}.1=\frac{6|CQ4p(q)|}{3|C{<}x{>}(x^2)|}=2\,.\emptyset_j(I)$

(b) *if* $g=(x^{2p1p2},1)$ *then* $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C{<}x{>}(x^2)|}.1=\frac{6|CQ4p(q)|}{3|C{<}x{>}(x^2)|}=2\,.\emptyset_j(x^{2p1p2})$.

(c) if $g=(x^{4p2},1)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C\langle x\rangle(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{3|C\langle x\rangle(x^2)|}.2=2.\emptyset_j(x^{4p2})$

(d) if $g=(x^{2p2},1)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C\langle x\rangle(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{3|C\langle x\rangle(x^2)|}.2=2.\emptyset_j(x^{2p2})$

(e) if $g=(x^{4p1},1)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C\langle x\rangle(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{3|C\langle x\rangle(x^2)|}.2=2.\emptyset_j(x^{4p1})$

(f) if $g=(x^{2p1},1)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C\langle x\rangle(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{3|C\langle x\rangle(x^2)|}.2=2.\emptyset_j(x^{2p1})$

(g) if $g=(x^4,1)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C\langle x\rangle(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{3|C\langle x\rangle(x^2)|}.2=2.\emptyset_j(x^4)$

(h) if $g=(x^2,1)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C\langle x\rangle(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{3|C\langle x\rangle(x^2)|}.2=2.\emptyset_j(x^2)$

(i) if $g=(I,r)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C\langle x\rangle(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{3|C\langle x\rangle(x^2)|}.2=2.\emptyset_j(q)$.

(k) if $g=(x^{2p1p2},r)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C\langle x\rangle(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{3|C\langle x\rangle(x^2)|}.2=2.\emptyset_j(q)$

(l) if $g=(x^{4p2},r)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^4)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^2)|}=\frac{6|CQ4p(q)|}{3|C<x>(x^2)|}.2=2.\emptyset_j(q)$.

(m) if $g=(x^{2p2},r)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^2)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^2)|}=\frac{6|CQ4p(q)|}{3|C<x>(x^2)|}.2=2.\emptyset_j(q)$.

(n) if $g=(x^{4p1},r)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^2)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^2)|}=\frac{6|CQ4p(q)|}{3|C<x>(x^2)|}.2=2.\emptyset_j(q)$.

(o) if $g=(x^{2p1},r)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^2)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^2)|}=\frac{6|CQ4p(q)|}{3|C<x>(x^2)|}.2=2.\emptyset_j(q)$.

(p) if $g=(x^4,r)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^2)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^2)|}=\frac{6|CQ4p(q)|}{3|C<x>(x^2)|}.2=2.\emptyset_j(q)$.

(q) if $g=(x^2,r)$ then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x^2)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x^2)|}=\frac{6|CQ4p(q)|}{3|C<x>(x^2)|}.2=2.\emptyset_j(q)$.

Since

$H\cap cl(g)=\{(I,1),(x^{2p1p2},1),(x^{4p2},1),(x^{2p2},1),(x^{4p2},1),(x^{2p1},1),(x^4,1),(x^2,1),(I,r),(x^{2p1p2},r),(x^{4p2},r),(x^{2p2},r),(x^{4p1},r),(x^{2p1},r),(x^4,r),(x^2,r)\}$ and $\emptyset(g)=\emptyset((g^{-1})=1$.othrewise=0.

12:-$H_{122}=<(x,r)>$; (a) if $g=(I,1)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x)|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x)|}=2.\emptyset j(I)$

if $g=(x^{2p1p2},1)$then $\emptyset_{112}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{|C<x>(x)|}.1=\frac{6|CQ4p(q)|}{3|C<x>(x)|}=2\ \emptyset_j(x^{2p1p2})$.)

c) if $g=(x^{p1p2},1)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x)|}.2=2.\emptyset_j(x^{p1p2})$

(d) if $g=(x^{4p2},1)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x)|}.2=2.\emptyset_j(x^{4p2})$

if $g=(x^{p2},1)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x)|}.2=2.\emptyset_j(x^{p2})$. (e)

(f) if $g=(x^{4p1},1)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x)|}.2=2.\emptyset_j(x^{4p1})$

(g) if $g=(x^{2p1},1)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x)|}.2=2.\emptyset_j(x^{2p1})$

(i) if $g=(x^{p1},1)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x)|}.2=2\,\emptyset_j(x^{p1})$.

(j) if $g=(x^4,1)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x)|}.2=2.\emptyset_j(x^4)$

(k) if $g=(x^2,1)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x)|}.2=2.\emptyset_j(x^2)$

(l) if $g=(x,1)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x)|}.2=2.\emptyset_j(x)$

(m) if $g=(I,r)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x)|}.2=2.\emptyset_j(q)$.

(n) if $g=(x^{2p1p2},r)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{3|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{3|C<x>(x)|}.2=2.\emptyset_j(q)$

(o) if $g=(x^{p1p2},r)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x)|}=\frac{6|CQ4p(q)|}{3|C<x>(x)|}$
$.2=2.\emptyset_j(q)$

(p) if $g=(x^{4p2},r)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{6.2p1p2}{3|C<x>(x)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x)|}=\frac{6|CQ4p(q)|}{3|C<x>(x)|}$

$.2= 2 .\emptyset_j(q)$

(q) if $g=(x^{2p2},r)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))= \frac{6.2p1p2}{3|C<x>(x)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x)|}=\frac{6|CQ4p(q)|}{3|C<x>(x)|}$

$.2= 2 .\emptyset_j(q)$

(r)if $g=(x^{p2},r)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))= \frac{6.2p1p2}{3|C<x>(x)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x)|}=\frac{6|CQ4p(q)|}{3|C<x>(x)|}$

$.2= 2 .\emptyset_j(q)$

(s) if $g=(x^{4p1},r)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))= \frac{6.2p1p2}{3|C<x>(x)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x)|}=\frac{6|CQ4p(q)|}{3|C<x>(x)|}.2= 2 .\emptyset_j(q)$

(t) if $g=(x^{2p1},r)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))= \frac{6.2p1p2}{3|C<x>(x)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x)|}=\frac{6|CQ4p(q)|}{3|C<x>(x)|}$

$.2= 2 .\emptyset_j(q)$

(u) if $g=(x^{p1},r)$ then then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))= \frac{6.2p1p2}{3|C<x>(x)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x)|}=\frac{6|CQ4p(q)|}{3|C<x>(x)|}$

$.2= 2 .\emptyset_j(q)$

(v) if $g=(x^4,r)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))= \frac{6.2p1p2}{3|C<x>(x)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x)|}=\frac{6|CQ4p(q)|}{3|C<x>(x)|}$

$.2= 2 .\emptyset_j(q)$

(w) if $g=(x^2,r)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))= \frac{6.2p1p2}{3|C<x>(x)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x)|}=\frac{6|CQ4p(q)|}{3|C<x>(x)|}$

$.2= 2 .\emptyset_j(q)$

(x) if $g=(x,r)$ then $\emptyset_{122}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))= \frac{6.2p1p2}{3|C<x>(x)|}(1+1+1+1)\frac{6.4(2p1p2)}{3|C<x>(x)|}=\frac{6|CQ4p(q)|}{3|C<x>(x)|}.2= 2 .\emptyset_j(q)$

Since $H\cap cl(g)=\{(I,1),(x^{2p1p2},1),(x^{p1p2},1),(x^{4p2},1),(x^{2p2},1),(x^{p2},1),(x^{4p1},1),(x^{2p1},1),(x^{p1},1),(x^4,1),(x^2,1),(x,1),(I,r),(x^{2p1p2},r),$
$(x^{p1p2},r),(x^{4p2},r),(x^{2p2},r),(x^{p2},r),(x^{4p1},r),(x^{2p1},r),(x^{p1},r),(x^4,r),(x^2,r),(x,r)\}$
And $\emptyset(g)=\emptyset((g^{-1}) = 1$.*othrewise=0.*

13:- $H_{132}=<(y,r)>$ (a) if $g=(I,1)$ then $\emptyset_{132}(g) = \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{12}.1=2.(2p)=2.\emptyset_{i+1}(I)$.

(b) if $g=(y^2,1)$ or $(x^{2p1p2},1)$ then $\emptyset_{132}(g) = \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{12}.1=2.(2p)=2.\emptyset_{i+1}(x^{2p1p2})$.

(c) if $g=(y,1)$ or $(y^3,1)$ then $\emptyset_{132}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))= \frac{24}{12}(1+1)=4$.

(d) if $g=(I,r)$ then $\emptyset_{132}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))= \frac{12.2p1p2}{12}(1+1)=2.(2p)=2.\ \emptyset_{i+1}(q)$.

(e) if $g=(y^2,r)$ or (x^{2p1p2},r) then $\emptyset_{132}(g) = \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12.2p1p2}{12}(1+1)=2.(2p)= 2.\ \emptyset_{i+1}(q)$.

(f) if $g=((y,r)$ or (y^3,r) then $\emptyset_{132}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12}{12}(1+1+1+1)=4$.

Since $H\cap cl(g)=\{(I,1),(y^2,1),(y,1),(I,r),(y^2,r),(y,r)\}$ *And* $\emptyset(g)=\emptyset((g^{-1}) = 1$.*othrewise=0.*

14:-$H_{142}=<(xy,r)>$ (a) if $g=(I,1)$ then$\emptyset_{142}(g) = \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{12}.1=2.(2p)=2.\emptyset_{i+2}(I)$.

(b) if $g=((xy)^2,1)=(x^{2p1p2},1)$ then$\emptyset_{142}(g) = \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{12}.1=2.(2p)=2.\emptyset_{i+2}(x^{2p1p2})$.

(c) if $g=(xy,1)$ or $((xy)^3,1)$ then $\emptyset_{142}(g) = \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{24}{12}(1+1)=4$.

(d) if $g=(I,r)$ then $\emptyset_{142}(g) = \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1})) =\frac{12.2p1p2}{12}(1+1)=2.(2p)= 2.\ \emptyset_{i+2}(q)$.

(e) if g=((xy)², r)=(x^{2p1p2}, r) then $\emptyset_{142}(g) = \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$ $=\frac{12.2p1p2}{12}(1+1)$*=2.(2p)= 2.* $\emptyset_{i+2}(q)$.

(f) if g=(xy,r) or((xy)³,r) then $\emptyset_{142}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12}{12}$*(1+1+1+1)=4.*

Since

H∩cl(g)=

$\{(I,1),((xy)^2,1)(xy,1),(I,r),((xy)^2,r),(xy,r)\} And\ \emptyset(g) = \emptyset((g^{-1}) = 1. othrewise = 0$

Case (III):-

*Consider the group **G=(Q_{4p1p2} ×D_3)** and if H is a cyclic subgroup of **(Q_{4p1p2}×{s })** then H=<(q,s)> and ∅ the principle character of H and ∅j Artin׳s character of **Q_{4p1p2}** , 1≤j≤i+2 ,by using theorem:-*

$$\emptyset_j(g) = \begin{cases} \frac{|CG(g)|}{|CH(g)|} \sum_{i=1}^{n} \emptyset(hi) & if\ hi \in H \cap cl(g) \\ 0 & if\ H \cap cl(g) = \emptyset \end{cases}$$

H=<(q,s)>

1:-H_{13}=<(I,s)> (a) if g=(I,1) then $\emptyset_{13}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g) = \frac{24.2p1p2}{2|C<x>(I)|}.1=\frac{6|CQ4p(q)|}{2|C<x>(I)|}.1=3.\emptyset_j(I)$.

(b) if g=(I,s) then $\emptyset_{13}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(I)|}.1=\frac{2|CQ4p(q)|}{2|C<x>(I)|}.1=\emptyset_j(q)$.

Since H∩cl(g)=$\{(I,1),(I,s)\}\ othrewise = 0$

2:-H_{23}=<(x^{2p1p2},s)> (a) if g=(I,1) then $\emptyset_{23}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{2|C<x>(x^{2p1p2})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{2p1p2})|}.1$ =3.∅j(I).

(b) if g=(x^{2p1p2},1) then $\emptyset_{23}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{2|C<x>(x^{2p1p2})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{2p1p2})|}.1 ==3.\emptyset j(x^{2p1p2})$.

(c) if g=(I,s) then $\emptyset_{23}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{2p1p2})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{2p1p2})|}.1=\emptyset_j(q)$.

(d) if g=(x^{2p1p2},s) then $\emptyset_{23}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{2p1p2})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{2p1p2})|}.1=\emptyset j(q)$.

Since H⌒cl(g)=$\{(I,1),(x^{2p1p2},1),(I,s),(x^{2p1p2},s)\}$ $And\ \emptyset(g)=\emptyset((g^{-1})=1\ othrewise=0$.

3:-H_{33}=<(x^{p1p2},s)> (a) if g=(I,1) then $\emptyset_{33}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{2|C<x>(x^{p1p2})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{p1p2})|}.1=3.\emptyset j(I)$.

(b) if g=(x^{2p1p2},1) then $\emptyset_{33}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{2|C<x>(x^{p1p2})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{p1p2})|}.1=3.\emptyset_j(x^{2p1p2})$.

(c) if g=(x^{p1p2},1) then $\emptyset_{33}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{p1p2})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{p1p2})|}.2=3.\emptyset_j(x^{p1p2})$.

(d) if g=(I,s) then $\emptyset_{33}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{p1p2})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{p1p2})|}.1=\emptyset_j(q)$.

(e) if g=(x^{2p1p2},s) then $\emptyset_{33}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{p1p2})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{p1p2})|}.1=\emptyset_j(q)$.

(f) if g=(x^{p1p2},s) then $\emptyset_{33}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{p1p2})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{p1p2})|}.2=\emptyset_j(q)$.

Since H⌒cl(g)=
$\{(I,1),(x^{2p1p2},1),(x^{p1p2},1),(I,s),(x^{2p1p2},s),(x^{p1p2},s)\}$ $And\ \emptyset(g)=\emptyset((g^{-1})=1\ othrewise=0$.

4:-H_{43}=<(x^{4p2},s)> (a) if g=(I,1) then $\emptyset_{43}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{2|C<x>(x^{4p2})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{4p2})|}.1=3.\emptyset j(I)$.

(b)if g=(x^{4p2},1) then $\emptyset_{43}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{4p2})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{4p2})|}.2=3\emptyset_j(x^{4p2})$.

(c) if g=(I,s) then $\emptyset_{43}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{4p2})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{4p2})|}.1=\emptyset j(q)$.

(d) if g=(x^{4p2},s) then $\emptyset_{43}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{4p2})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{4p2})|}.2=\emptyset j(q)$.

Since H∩cl(g)={$(I,1),(x^{4p2},1),(I,s),(x^{4p2},s)\}$ $And\ \emptyset(g)=\emptyset((g^{-1})=1\ othrewise=0$.

5:-H_{53}=<(x^{2p2},s)> (a) if g=(I,1) then $\emptyset_{53}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{2|C<x>(x^{2p2})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{2p2})|}.1=3.\emptyset j(I)$.

(b) if g=(x^{2p1p2},1) then $\emptyset_{53}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{2|C<x>(x^{2p2})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{2p2})|}.1=3.\emptyset_j(x^{2p1p2})$.

(c) if g=(x^{4p2},1) then $\emptyset_{53}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{4p2})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{4p2})|}.2=3.\emptyset_j(x^{4p2})$.

(d) if g=(x^{2p2},1) then $\emptyset_{53}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{2p2})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{2p2})|}.2=3.\emptyset_j(x^{2p2})$.

(e) if g=(I,s) then $\emptyset_{53}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{2p2})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{2p2})|}.1=\emptyset_j(q)$.

(f) if g=(x^{2p1p2},s) then$\emptyset_{53}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{2p2})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{2p2})|}.1=\emptyset_j(q)$.

(g) if g=(x^{4p2},s) then $\emptyset_{53}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{2p2})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{2p2})|}.2=\emptyset_j(q)$.

(h) if g=(x^{2p2},s) then $\emptyset_{53}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{2p2})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{2p2})|}.2=\emptyset_j(q)$.

Since

H∩cl(g)=

$\{(I,1),(x^{2p1p2},1),(x^{4p2},1),(x^{2p2},1),(I,s),(x^{2p1p2},s),(x^{4p2},s),(x^{2p2},s)\}And\ \emptyset(g)=\emptyset((g^{-1})=1\ othrewise=0$.

6:-H_{63}=<(x^{p2},s)> (a) if g=(I,1) then $\emptyset_{63}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{2|C<x>(x^{p2})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{p2})|}.1=3.\emptyset j(I)$.

(b) if g=(x^{2p1p2},1) then $\emptyset_{63}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{2|C<x>(x^{p2})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{p2})|}.1=3.\emptyset_j(x^{2p1p2})$.

(c) if g=(x^{p1p2},1) then $\emptyset_{63}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{p2})|}.2=3.\emptyset j(x^{p1p2})$.

(d)if g=(x^{4p2},1) then $\emptyset_{63}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{p2})|}.2=3.\emptyset_j(x^{4p2})$.

(e) if g=(x^{2p2},1) then $\emptyset_{63}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{p2})|}.2=3.\emptyset_j(x^{2p2})$.

(f) if g=(x^{p2},1) then $\emptyset_{63}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{p2})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{p2})|}.2=3.\emptyset_j(x^{2p})$.

(g) if g=(I,s) then $\emptyset_{63}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{p2})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{p2})|}.1=\emptyset_j(q)$.

(h) if g=(x^{2p1p2},s) then$\emptyset_{63}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{p2})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{p2})|}.1=\emptyset_j(q)$.

(i) if g=(x^{p1p2},s) then $\emptyset_{63}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{p2})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{p2})|}.2=\emptyset_j(q)$.

(j) if g=(x^{4p2},s) then $\emptyset_{63}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{p2})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{p2})|}.2=\emptyset_j(q)$.

(k) if g=(x^{2p2},s) then $\emptyset_{63}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{p2})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{p2})|}.2=\emptyset_j(q)$.

(l) if g=(x^{p2},s) then $\emptyset_{63}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{p2})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{p2})|}.2=\emptyset_j(q)$.

Since

H∩cl(g)={(I,1),(x^{2p1p2},1),(x^{p1p2},1),(x^{4p2},1),(x^{2p2},1),(x^{p2},1),(I,s),(x^{2p1p2}, s),(x^{p1p2},s),(x^{4p2},s),(x^{2p2},s),(x^{p2},s)}

$And\ \emptyset(g) = \emptyset((g^{-1}) = 1\ othrewise = 0.$

7:-H_{73}=<(x^{4p1},s)>; (a) if g=(I,1) then $\emptyset_{73}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g) = \frac{24.2p1p2}{2|C<x>(x^{4p1})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{4p1})|}.1=3.\emptyset j(I)$.

(b) if g=(x^{4p1},1) then $\emptyset_{73}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{4p1})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{4p1})|}.2=3.\emptyset_j(x^{4p1})$

(c) if g=(I,s) then $\emptyset_{73}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{4p1})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{4p1})|}.1=\emptyset_j q)$.

(d) if g=(x^{4p1},s) then $\emptyset_{73}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{4p1})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{4p1})|}.2=\emptyset_j(q)$.

Since H∩cl(g)={(I,1),(x^{4p1},1),(I,s),(x^{4p1},s)} and$\emptyset(g) = \emptyset((g^{-1}) = 1\ othrewise = 0$

8:-H_{83}=<(x^{2p1},s)>; (a) if g=(I,1) then $\emptyset_{83}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g) = \frac{24.2p1p2}{2|C<x>(x^{2p1})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{2p1})|}.1=3.\emptyset j(I)$.

(b) if g=(x^{2p1p2},1) then $\emptyset_{83}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g) = \frac{24.2p1p2}{2|C<x>(x^{2p1})|}.1=\frac{6|CQ4p|}{2|C<x>(x^{2p1})|}.1=3.\emptyset_j(x^{2p1p2})$.

(c) if g=(x^{4p1},1) then $\emptyset_{83}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{2p1})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{2p1})|}.2=3.\emptyset_j(x^{4p1})$

(d) if g=(x^{2p1},1) then $\emptyset_{83}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{2p1})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{2p1})|}.2=3.\emptyset_j(x^{2p1})$

(e) if g=(I,s) then $\emptyset_{83}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{2p1})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{2p1})|}.1=\emptyset_j(q)$.

(f) if g=(x^{2p1p2},s) then$\emptyset_{83}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{2p1})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{2p1})|}.1=\emptyset_j(q)$.

(g) if g=(x^{4p1},s) then $\emptyset_{83}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{2p1})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{2p1})|}.2=\emptyset_j(q)$.

(h) if g=(x^{2p1},s) then $\emptyset_{83}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{2p1})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{2p1})|}.2=\emptyset_j(q)$.

Since

H∩cl(g)={(I,1),(x^{2p1p2},1),(x^{4p1},1),(x^{2p1},1),(I,s),(x^{2p1p2},s),(x^{4p1},s),(x^{2p1}, s)} And$\emptyset(g)=\emptyset((g^{-1})=1\ othrewise=0$

9:-H_{93}=<(x^{p1},s)>; (a) if g=(I,1) then $\emptyset_{93}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{2|C<x>(x^{p1})|}.1=\frac{6|CQ4p|}{2|C<x>(x^{p1})|}.1=3.\emptyset j(I)$.

(b) if g=(x^{2p1p2},1) then $\emptyset_{93}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{2|C<x>(x^{p1})|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^{p1})|}.1=3.\emptyset_j(x^{2p1p2})$.

(c) if g=(x^{p1p2},1) then $\emptyset_{93}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{p1})|}.2=3.\emptyset j(x^{p1p2})$.

(d) if g=(x^{4p1},1) then $\emptyset_{93}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{p1})|}.2=3.\emptyset_j(x^{4p1})$

(e) if g=(x^{2p1},1) then $\emptyset_{93}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{p1})|}.2=3.\emptyset_j(x^{2p1})$

(f) if g=(x^{p1},1) then $\emptyset_{93}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^{p1})|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^{p1})|}.2=3.\emptyset_j(x^{p1})$

(g) if g=(I,s) then $\emptyset_{93}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{2p1})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{p1})|}.1=\emptyset_j(q)$.

(h) if g=(x^{2p1p2},s) then$\emptyset_{93}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^{p1})|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^{p1})|}.1=\emptyset_j(q)$.

(i) if g=(x^{4p1},s) then $\emptyset_{93}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{p1})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{p1})|}.2=\emptyset_j(q)$.

(j) if g=(x^{2p1},s) then $\emptyset_{93}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^{p1})|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^{p1})|}.2=\emptyset_j(q)$.

(k) if g=(x^{p1},s) then $\emptyset_{93}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{4.2p1p2}{2|C<x>(x^{p1})|}$(1+1)=$\frac{|CQ4p(q)|}{2|C<x>(x^{p1})|}$.2=$\emptyset_j(q)$.

Since

H∩cl(g)={(I,1),(x^{2p1p2},1),(x^{4p1},1),(x^{2p1},1),(x^{p1},1),(I,s),(x^{2p1p2},s),(x^{4p1},s),(x^{2p1},s),(x^{p1},s)}

And$\emptyset(g) = \emptyset((g^{-1}) = 1\ othrewise = 0$.

10:-H_{103}=<(x^4,s)>; (a) if g=(I,1) then $\emptyset_{103}(g)$= $\frac{|CG(g)|}{|CH(g)|}\emptyset(g) = \frac{24.2p1p2}{2|C<x>(x^4)|}$.1=$\frac{6|CQ4p(q)|}{2|C<x>(x^4)|}$.1=3.$\emptyset_j$(I).

(b)if g=(x^{4p2},1) then $\emptyset_{103}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{12.2p1p2}{2|C<x>(x^4)|}$(1+1)=$\frac{3|CQ4p(q)|}{2|C<x>(x^4)|}$.2=3.$\emptyset_j(x^{4p2})$.

(c) if g=(x^{4p1},1) then $\emptyset_{103}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{12.2p1p2}{2|C<x>(x^4)|}$(1+1)=$\frac{3|CQ4p(q)|}{2|C<x>(x^4)|}$.2=3.$\emptyset_j(x^{4p1})$

(d) if g=(x^4,1) then $\emptyset_{103}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{12.2p1p2}{2|C<x>(x^4)|}$(1+1)=$\frac{3|CQ4(q)p|}{2|C<x>(x^4)|}$.2=3.$\emptyset j(x^4)$

(e) if g=(I,s) then $\emptyset_{103}(g)$= $\frac{|CG(g)|}{|CH(g)|}\emptyset(g)$=$\frac{8.2p1p2}{2|C<x>(x^4)|}$.1=$\frac{2|CQ4p(q)|}{2|C<x>(x^4)|}$.1=$\emptyset_j(q)$.

(f) if g=(x^{4p2},s) then $\emptyset_{103}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{4.2p1p2}{2|C<x>(x^4)|}$(1+1)=$\frac{|CQ4p(q)|}{2|C<x>(x^4)|}$.2=$\emptyset_j(q)$.

(g) if g=(x^{4p1},s) then $\emptyset_{103}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{4.2p1p2}{2|C<x>(x^4)|}$(1+1)=$\frac{|CQ4p(q)|}{2|C<x>(x^4)|}$.2=$\emptyset_j(q)$.

(h) if g=(x^4,s) then $\emptyset_{103}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{4.2p1p2}{2|C<x>(x^4)|}$(1+1)=$\frac{|CQ4p(q)|}{2|C<x>(x^4)|}$.2=$\emptyset_j(q)$.

Since

H∩cl(g)={(I,1),(x^{4p2},1),(x^{4p1},1),(x^4,1),(I,s),(x^{4p2},s),(x^{4p1},s),(x^4,s)}

and$\emptyset(g) = \emptyset((g^{-1}) = 1\ othrewise = 0$.

11:-H_{113}=<(x^2,s)>; (a) if g=(I,1) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g) = \frac{24.2p1p2}{2|C<x>(x^2)|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^2)|}.1=3.\emptyset_j(I)$.

(b) if g=(x^{2p1p2},1) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g) = \frac{24.2p1p2}{2|C<x>(x^2)|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x^2)|}.1=3.\emptyset_j(x^{2p1p2})$.

(c) if g=(x^{4p2},1) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^2)|}.2=3.\emptyset_j(x^{4p2})$.

(d) if g=(x^{2p2},1) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^2)|}.2=3.\emptyset_j(x^{2p2})$.

(e) if g=(x^{4p1},1) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^2)|}.2=3.\emptyset_j(x^{4p1})$

(f) if g=(x^{2p1},1) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^2)|}.2=3.\emptyset_j(x^{2p1})$

(g) if g=(x^4,1) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^2)|}.2=3.\emptyset_j(x^4)$

(h) if g=(x^2,1) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x^2)|}.2=3.\emptyset_j(x^2)$

(i) if g=(I,s) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^2)|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^2)|}.1=\emptyset_j(q)$.

(j) if g=(x^{2p1p2},s) then$\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x^2)|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x^2)|}.1=\emptyset_j(q)$.

(k) if g=(x^{4p2},s) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^2)|}.2=\emptyset_j(q)$.

(l) if g=(x^{2p2},s) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g) + \emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^2)|}.2=\emptyset_j(q)$.

(m) if g=(x^{4p1},s) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^2)|}.2=\emptyset_j(q).$

(n) if g=(x^{2p1},s) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^2)|}.2=\emptyset_j(q).$

(0) if g=(x^4,s) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^2)|}.2=\emptyset_j(q).$

(p) if g=(x^2,s) then $\emptyset_{113}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x^2)|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x^2)|}.2=\emptyset_j(q).$

Since
H∩cl(g)={(I,1),(x^{2p1p2},1),(x^{4p2},1),(x^{2p2},1),(x^{4p1},1),(x^{2p1},1),(x^4,1),(x^2,1) ,(I,s),(x^{2p1p2},s),
(x^{4p2},s),(x^{2p2},s),(x^{4p1},s),(x^{2p1},s),(x^4,s),(x^2,s)} and
$\emptyset(g) = \emptyset((g^{-1}) = 1\ othrewise = 0.$

12:-H_{123}=<(x,s)>; (a) if g=(I,1) then $\emptyset_{123}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g) = \frac{24.2p1p2}{2|C<x>(x)|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x)|}.1=3.\emptyset_j(I).$

(b) if g=(x^{2p1p2},1) then $\emptyset_{123}(g)= \frac{|CG(g)|}{|CH(g)|}\emptyset(g) = \frac{24.2p1p2}{2|C<x>(x)|}.1=\frac{6|CQ4p(q)|}{2|C<x>(x)|}.1=3.\emptyset_j(x^{2p1p2}).$

(c) if g=(x^{p1p2},1) then $\emptyset_{123}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x)|}.2=3.\emptyset_j(x^{p1p2}).$

(d) if g=(x^{4p2},1) then $\emptyset_{123}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x)|}.2=3.\emptyset_j(x^{4p2}).$

(e) if g=(x^{2p2},1) then $\emptyset_{123}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x)|}.2=3.\emptyset_j(x^{2p2}).$

(f) if g=(x^{p2},1) then $\emptyset_{123}(g)= \frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x)|}.2=3.\emptyset_j(x^{2p}).$

(g) if g=(x^{4p1},1) then $\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x)|}.2=3.\emptyset_j(x^{4p1})$

(h) if g=(x^{2p1},1) then $\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x)|}.2=3.\emptyset_j(x^{2p1})$

(i) if g=(x^{p1},1) then $\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x)|}.2=3.\emptyset j(x^{p1})$

(j) if g=(x^4,1) then $\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x)|}.2=3.\emptyset_j(x^4)$

(k) if g=(x^2,1) then $\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x)|}.2=3.\emptyset j(x^2)$

(l) if g=(x,1) then $\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{12.2p1p2}{2|C<x>(x)|}(1+1)=\frac{3|CQ4p(q)|}{2|C<x>(x)|}.2=3.\emptyset_j(x)$

(m) if g=(I,s) then $\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x)|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x)|}.1=\emptyset_j(q)$.

(n) if g=(x^{2p1p2},s) then$\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{8.2p1p2}{2|C<x>(x)|}.1=\frac{2|CQ4p(q)|}{2|C<x>(x)|}.1=\emptyset_j(q)$.

(o) if g=(x^{p1p2},s) then $\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x)|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x)|}.2=\emptyset_j(q)$.

(p) if g=(x^{4p2},s) then $\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x)|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x)|}.2=\emptyset_j(q)$.

(q) if g=(x^{2p2},s) then $\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x)|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x)|}.2=\emptyset_j(q)$.

(r) if g=(x^{p2},s) then $\emptyset_{123}(g)=\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))=\frac{4.2p1p2}{2|C<x>(x)|}(1+1)=\frac{|CQ4p(q)|}{2|C<x>(x)|}.2=\emptyset_j(q)$.

(s) if g=(x^{4p1},s) then $\emptyset_{123}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{4.2p1p2}{2|C<x>(x)|}$(1+1)=$\frac{|CQ4p(q)|}{2|C<x>(x)|}$.2=$\emptyset j(q)$.

(t) if g=(x^{2p1},s) then $\emptyset_{123}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{4.2p1p2}{2|C<x>(x)|}$(1+1)=$\frac{|CQ4p(q)|}{2|C<x>(x)|}$.2=$\emptyset_j(q)$.

(u) if g=(x^{p1},s) then $\emptyset_{123}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{4.2p1p2}{2|C<x>(x)|}$(1+1)=$\frac{|CQ4p(q)|}{2|C<x>(x)|}$.2=$\emptyset_j(q)$.

(v) if g=(x^4,s) then $\emptyset_{123}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{4.2p1p2}{2|C<x>(x)|}$(1+1)=$\frac{|CQ4p(q)|}{2|C<x>(x)|}$.2=$\emptyset_j(q)$.

(w) if g=(x^2,s) then $\emptyset_{123}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{4.2p1p2}{2|C<x>(x)|}$(1+1)=$\frac{|CQ4p(q)|}{2|C<x>(x)|}$.2=$\emptyset\ \ (q)$.

(x) if g=(x,s) then $\emptyset_{113}(g)$= $\frac{|CG(g)|}{|CH(g)|}(\emptyset(g)+\emptyset(g^{-1}))$=$\frac{4.2p1p2}{2|C<x>(x)|}$(1+1)=$\frac{|CQ4p(q)|}{2|C<x>(x)|}$.2$\emptyset_j(q)$.

Since
H∩cl(g)={(I,1),(x^{2p1p2},1),(x^{4p2},1),(x^{2p2},1),(x^{p2},1),(x^{4p1},1),(x^{2p1},1),(x^{p1}, 1),
(x^4,1),(x^2,1),(x,1),
(I,s),(x^{2p1p2},s),(x^{4p2},s),(x^{2p2},s),(x^{p2},s),(x^{4p1},s),(x^{2p1},s),(x^{p1},s),(x^4,s),(x^2, s),(x,s)} and $\emptyset(g)=\emptyset((g^{-1})=1\ othrewise=0$.(

13:-H_{133}=<(y,s)>; (a) if g=(I,1) then $\emptyset_{133}(g)$= $\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{8}$.1=3.$\emptyset_{i+1}$(I).

(b) if g=(y^2,1) =(x^{2p1p2},1) then $\emptyset_{133}(g)$= $\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{8}$.1=3.$\emptyset_{i+1}(x^{2p1p2})$.

(c) if g=(y,1) or (y^3,1) then $\emptyset_{133}(g)$= $\frac{|CG(g)|}{|CH(g)|}\left(\emptyset(g)+\emptyset(g^{-1})\right)=\frac{24}{8}$(1+1)=6.

(d) if g=(I,s) then $\emptyset_{133}(g)$= $\frac{|CG(g)|}{|CH(g)|}\emptyset(g)$=$\frac{8.2p1p2}{8}$.1=$\emptyset_{i+1}$(q).

(e) if g=(y^2,s)=(x^{2p1p2},s) then $\emptyset_{133}(g)$= $\frac{|CG(g)|}{|CH(g)|}\emptyset(g)$=$\frac{8.2p1p2}{8}$.1=$\emptyset_{i+1}$(q).

(f) if g=(y,s) or (y^3,s) then$\emptyset_{133}(g)$= $\frac{|CG(g)|}{|CH(g)|}\left(\emptyset(g)+\emptyset(g^{-1})\right)$ =$\frac{8}{8}$(1+1)=2.

Since H∩cl(g)={$(I,1),(y^2,1),(y,1),(I,s),(y^2,s),(y,s)\}$ $And\ \emptyset(g)=\emptyset((g^{-1})$ =1 $othrewise = 0$.

14:-H_{143}=<(xy,s)>; a) if g=(I,1) then $\emptyset_{143}(g)$= $\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{8}$.1=3.$\emptyset_{i+2}$(I).

(b) if g=($(xy)^2$,1) =(x^{2p1p2},1) then $\emptyset_{143}(g)$= $\frac{|CG(g)|}{|CH(g)|}\emptyset(g)=\frac{24.2p1p2}{8}$.1=3.$\emptyset_{i+2}(x^{2p1p2})$.

(c) if g=(xy,1) or ($(xy)^3$,1) then $\emptyset_{143}(g)$= $\frac{|CG(g)|}{|CH(g)|}\left(\emptyset(g)+\emptyset(g^{-1})\right)=\frac{24}{8}$(1+1)=6.

(d) if g=(I,s) then $\emptyset_{143}(g)$= $\frac{|CG(g)|}{|CH(g)|}\emptyset(g)$=$\frac{8.2p1p2}{8}$.1=$\emptyset_{i+2}$(q).

(e) if g=($(xy)^2$,s) =(x^{2p1p2},s) then $\emptyset_{143}(g)$= $\frac{|CG(g)|}{|CH(g)|}\emptyset(g)$=$\frac{8.2p1p2}{8}$.1=$\emptyset_{i+2}$(q).

(f) if g=(xy,s) or ($(xy)^3$,s) then $\emptyset_{143}(g)$= $\frac{|CG(g)|}{|CH(g)|}\left(\emptyset(g)+\emptyset(g^{-1})\right)$ =$\frac{8}{8}$(1+1)=2.

Since H∩cl(g) ={$(I,1),((xy)^2,1),(xy,1),(I,s),((xy)^2,s),(xy,s)\}$$And\ \emptyset(g)=\emptyset((g^{-1})$ =*1* $othrewise = 0$.

Note: $(xy)^2=y^2$ since $(xy)^2$=xyxy= xyxy.y^2y^2=$xyxy^3y^2$=$x(yxy^3)y^2$=$xx^{-1}y^2$=y^2.

<u>Example:-(4,2)</u>

*Let p_1=3 and p_2=7; m=$2p_1p_2$=2.3.7=42,such that p_1,p_2 are prime numbers, Q_{2m}=Q_{84}, To find Artin's character of the group **(Q_{84} × D_3)** the cyclic subgroup of **Q_{84}** which are {<I>,<x^{42}>,<x^{21}>,<x^{28}>,<x^{14}>,<x^7>,<x^{12}>,<x^6>,<x^3>,<x^4>,<x^2>,<x>,<y >,*

$\langle xy\rangle\}$ and subgroup of $\boldsymbol{D_3}$ which are $\{\langle 1\rangle,\langle r\rangle,\langle s\rangle\}$

The subgroup of $(\boldsymbol{Q_{84}} \times \boldsymbol{D_3})$ are
$\{\langle I,1\rangle,\langle x^{42},1\rangle,\langle x^{21},1\rangle,\langle x^{28},1\rangle,\langle x^{14},1\rangle,\langle x^{7},1\rangle,\langle x^{12},1\rangle,\langle x^{6},1\rangle,\langle x^{3},1\rangle,$
$\langle x^{4},1\rangle,\langle x^{2},1\rangle,\langle x,1\rangle,\langle y,1\rangle,\langle xy,1\rangle,$
$\langle I,r\rangle,\langle x^{42},r\rangle,\langle x^{21},r\rangle,\langle x^{28},r\rangle,\langle x^{14},r\rangle,\langle x^{7},r\rangle,\langle x^{12},r\rangle,\langle x^{6},r\rangle,$
$\langle x^{3},r\rangle,\langle x^{4},r\rangle,\langle x^{2},r\rangle,\langle x,r\rangle,\langle y,r\rangle,\langle xy,r\rangle,$
$\langle I,s\rangle,\langle x^{42},s\rangle,\langle x^{21},s\rangle,\langle x^{28},s\rangle,\langle x^{14},r\rangle,\langle x^{7},s\rangle,\langle x^{12},s\rangle,\langle x^{6},s\rangle,$
$\langle x^{3},s\rangle,\langle x^{4},s\rangle,\langle x^{2},s\rangle,\langle x,s\rangle,\langle y,s\rangle,\langle xy,s\rangle\}$

By using theorem:-

$$\emptyset_j(g) = \left\{\begin{matrix} \frac{|CG(g)|}{|CH(g)|} \sum_{i=1}^{n} \emptyset(hi) & if\ hi \in H \cap cl(g) \\ 0 & if\ H \cap cl(g) = \emptyset \end{matrix}\right\}$$

=Then $\boldsymbol{Ar(Q_{84}\times D_3)= Ar(Q_{2^2.3.7} \times D_3)= Ar(Q_{2^2.3.7}) \otimes Ar(D_3)}$

	Γ-classes of $Q_{84}\times\{1\}$													
	[I,1]	[x^{42},1]	[x^{21},1]	[x^{28},1]	[x^{14},1]	[x^{7},1]	[x^{12},1]	[x^{6},1]	[x^{3},1]	[x^{4},1]	[x^{2},1]	[x,1]	[y,1]	[xy,1]
Φ(I,1)	1008	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(2,1)	504	504	0	0	0	0	0	0	0	0	0	0	0	0
Φ(3,1)	252	252	252	0	0	0	0	0	0	0	0	0	0	0
Φ(4,1)	336	0	0	336	0	0	0	0	0	0	0	0	0	0
Φ(5,1)	168	168	0	168	168	0	0	0	0	0	0	0	0	0
Φ(6,1)	84	84	84	84	84	84	0	0	0	0	0	0	0	0
Φ(7,1)	144	0	0	0	0	0	144	0	0	0	0	0	0	0
Φ(8,1)	72	72	0	0	0	0	72	72	0	0	0	0	0	0
Φ(9,1)	36	36	36	0	0	0	36	36	36	0	0	0	0	0
Φ(10,1)	48	0	0	48	0	0	48	0	0	48	0	0	0	0
Φ(11,1)	24	24	0	24	24	o	24	24	0	24	24	0	0	0
Φ(12,1)	12	12	12	12	12	12	12	12	12	12	12	12	0	0
Φ(13,1)	252	252	0	0	0	0	0	0	0	0	0	0	12	0
Φ(14,1)	252	252	0	0	0	0	0	0	0	0	0	0	0	12

	Γ-classes of $Q_{84}\times\{r\}$													
	[I,r]	[x^{42},r]	[x^{21},r]	[x^{28},r]	[x^{14},r]	[x^{7},r]	[x^{12},r]	[x^{6},r]	[x^{3},r]	[x^{4},r]	[x^{2},r]	[x,r]	[y,r]	[xy,r]
Φ(I,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(2,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(3,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(4,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(5,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(6,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(7,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(8,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(9,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(10,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(11,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(12,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(13,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(14,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Γ-classes of $Q_{84}\times\{s\}$													
	[I,s]	[x^{42},s]	[x^{21},s]	[x^{28},s]	[x^{14},s]	[x^{7},s]	[x^{12},s]	[x^{6},s]	[x^{3},s]	[x^{4},s]	[x^{2},s]	[x,s]	[y,s]	[xy,s]
Φ(I,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(2,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(3,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(4,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(5,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(6,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(7,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(8,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(9,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(10,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(11,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(12,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(13,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(14,1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Γ-classes of $Q_{84}\times\{1\}$													
	[I,1]	[x^{42},1]	[x^{21},1]	[x^{28},1]	[x^{14},1]	[x^{7},1]	[x^{12},1]	[x^{6},1]	[x^{3},1]	[x^{4},1]	[x^{2},1]	[x,1]	[y,1]	[xy,1]
Φ(I,2)	336	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(2,2)	168	168	0	0	0	0	0	0	0	0	0	0	0	0
Φ(3,2)	84	84	84	0	0	0	0	0	0	0	0	0	0	0
Φ(4,2)	112	0	0	112	0	0	0	0	0	0	0	0	0	0
Φ(5,2)	56	56	0	56	56	0	0	0	0	0	0	0	0	0
Φ(6,2)	28	28	28	28	28	28	0	0	0	0	0	0	0	0
Φ(7,2)	48	0	0	0	0	0	48	0	0	0	0	0	0	0
Φ(8,2)	24	24	0	0	0	0	24	24	0	0	0	0	0	0
Φ(9,2)	12	12	12	0	0	0	12	12	12	0	0	0	0	0
Φ(10,2)	16	0	0	16	0	0	16	0	0	16	0	0	0	0
Φ(11,2)	8	8	0	8	8	0	8	8	0	8	8	0	0	0
Φ(12,2)	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Φ(13,2)	84	84	0	0	0	0	0	0	0	0	0	0	4	0
Φ(14,2)	84	84	0	0	0	0	0	0	0	0	0	0	0	4

	Γ-classes of $Q_{84}\times\{r\}$													
	[I,r]	[x^{42},r]	[x^{21},r]	[x^{28},r]	[x^{14},r]	[x^{7},r]	[x^{12},r]	[x^{6},r]	[x^{3},r]	[x^{4},r]	[x^{2},r]	[x,r]	[y,r]	[xy,r]
Φ(I,2)	336	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(2,2)	168	168	0	0	0	0	0	0	0	0	0	0	0	0
Φ(3,2)	84	84	84	0	0	0	0	0	0	0	0	0	0	0
Φ(4,2)	112	0	0	112	0	0	0	0	0	0	0	0	0	0
Φ(5,2)	56	56	0	56	56	0	0	0	0	0	0	0	0	0
Φ(6,2)	28	28	28	28	28	28	0	0	0	0	0	0	0	0
Φ(7,2)	48	0	0	0	0	0	48	0	0	0	0	0	0	0
Φ(8,2)	24	24	0	0	0	0	24	24	0	0	0	0	0	0
Φ(9,2)	12	12	12	0	0	0	12	12	12	0	0	0	0	0
Φ(10,2)	16	0	0	16	0	0	16	0	0	16	0	0	0	0
Φ(11,2)	8	8	0	8	8	0	8	8	0	8	8	0	0	0
Φ(12,2)	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Φ(13,2)	84	84	0	0	0	0	0	0	0	0	0	0	4	0
Φ(14,2)	84	84	0	0	0	0	0	0	0	0	0	0	0	4

	Γ-classes of Q_{84} × {1}													
	[I,1]	[x^{42},1]	[x^{21},1]	[x^{28},1]	[x^{14},1]	[x^7,1]	[x^{12},1]	[x^6,1]	[x^3,1]	[x^4,1]	[x^2, 1]	[x,1]	[y,1]	[xy,1]
Φ(I,3)	504	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(2,3)	252	252	0	0	0	0	0	0	0	0	0	0	0	0
Φ(3,3)	126	126	126	0	0	0	0	0	0	0	0	0	0	0
Φ(4,3)	168	0	0	168	0	0	0	0	0	0	0	0	0	0
Φ(5,3)	84	84	0	84	84	0	0	0	0	0	0	0	0	0
Φ(6,3)	42	42	42	42	42	42	0	0	0	0	0	0	0	0
Φ(7,3)	72	0	0	0	0	0	72	0	0	0	0	0	0	0
Φ(8,3)	36	36	0	0	0	0	36	36	0	0	0	0	0	0
Φ(9,3)	18	18	18	0	0	0	18	18	18	0	0	0	0	0
Φ(10,3)	24	0	0	24	0	0	24	0	0	24	0	0	0	0
Φ(11,3)	24	24	0	24	24	o	24	24	0	24	24	0	0	0
Φ(12,3)	12	12	12	12	12	12	12	12	12	12	12	12	0	0
Φ(13,3)	126	12 6	0	0	0	0	0	0	0	0	0	0	6	0
Φ(14,3)	126	126	0	0	0	0	0	0	0	0	0	0	0	6

	Γ-classes of Q_{84} × {s }													
	[I,s]	[x^{42},s]	[x^{21},s]	[x^{28},s]	[x^{14},s]	[x^7,s]	[x^{12},s]	[x^6,s]	[x^3,s]	[x^4,s]	[x^2,s]	[x,s]	[y,s]	[xy,s]
Φ(I,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(2,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(3,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(4,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(5,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(6,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(7,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(8,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(9,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(10,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(11,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(12,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(13,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(14,2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Γ-classes of Q_{84} × {r}													
	[I,r]	[x^{42},r]	[x^{21},r]	[x^{28},r]	[x^{14},r]	[x^7,r]	[x^{12},r]	[x^6,r]	[x^3,r]	[x^4,r]	[x^2,r]	[x,r]	[y,r]	[xy,r]
Φ(I,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(2,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(3,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(4,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(5,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(6,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(7,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(8,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(9,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(10,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(11,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(12,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(13,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(14,3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Γ-classes of $Q_{84}\times\{s\}$													
	[I,s]	$[x^{42},s]$	$[x^{21},s]$	$[x^{28},s]$	$[x^{14},s]$	$[x^{7},s]$	$[x^{12},s]$	$[x^{6},s]$	$[x^{3},s]$	$[x^{4},s]$	$[x^{2},s]$	[x,s]	[y,s]	[xy,s]
Φ(I,3)	168	0	0	0	0	0	0	0	0	0	0	0	0	0
Φ(2,3)	84	84	0	0	0	0	0	0	0	0	0	0	0	0
Φ(3,3)	42	42	42	0	0	0	0	0	0	0	0	0	0	0
Φ(4,3)	56	0	0	56	0	0	0	0	0	0	0	0	0	0
Φ(5,3)	28	28	0	28	28	0	0	0	0	0	0	0	0	0
Φ(6,3)	42	42	42	42	42	42	0	0	0	0	0	0	0	0
Φ(7,3)	24	0	0	0	0	0	24	0	0	0	0	0	0	0
Φ(8,3)	12	12	0	0	0	0	12	12	0	0	0	0	0	0
Φ(9,3)	6	6	6	0	0	0	6	6	6	0	0	0	0	0
Φ(10,3)	8	0	0	8	0	0	8	0	0	8	0	0	0	0
Φ(11,3)	4	4	0	4	4	0	4	4	0	4	4	0	0	0
Φ(12,3)	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Φ(13,3)	42	42	0	0	0	0	0	0	0	0	0	0	2	0
Φ(14,3)	42	42	0	0	0	0	0	0	0	0	0	0	0	2

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