1. Introduction. Bang [1] in 1895 found that the coefficients of the monic cyclotomic polynomial \( F_{pqr} \), where \( p < q < r \) are odd primes, are not greater than \( p - 1 \) in absolute value. No better upper bound has heretofore appeared. However, the author in [3] and Bloom in [4] simultaneously established \( (p + 1)/2 \) as the upper bound in the special case where \( q \) and/or \( r \) is congruent to \( \pm 1 \) modulo \( p \). Bloom also proved that, for a coefficient of value \( p - 1 \) to appear, a necessary condition is: \( mqr + hq + r \) is not divisible by \( p \), \( h = \pm 1 \), \( m \) an integer such that \( |m| \leq \min(3, (p - 3)/2) \). It is the purpose of this paper to show that \( p/c \) when \( p = 4k + 1 \) or \( p - (k + 1) \) when \( p = 4k + 3 \) is a better general bound on these coefficients.

2. Preliminary notions. Let

\[
F_{pqr}(x) = \sum_{n=0}^{\varphi(pqr)/2} c_n x^n.
\]

Then, from [2],

\[
c_n = \sum (-1)^{i_1 + i_2},
\]

where the summation (1) is over all partitions of \( n \) such that \( 0 \leq n \leq \varphi(pqr) \), \( \varphi(m) \) is the Euler \( \varphi \)-function and

\[
n = a + \alpha pq \rightarrow \beta pr + \gamma qr + \delta_1 q + \delta_2 r,
\]

\( \delta_1, \delta_2 = 0, 1; 0 \leq a < p; 0 \leq \alpha < r; 0 \leq \beta < q; 0 \leq \gamma < p - 1. \)

Then \( c_n = 0 \) when \( n \) has no partition of the form (2). Otherwise the value of \( c_n \) will be determined by the number of such partitions of \( n \) and by the values of \( \delta_1 \) and \( \delta_2 \) in these partitions. Since the cyclotomic polynomial is symmetric we examine \( c_n \) only for \( n \leq [\varphi(pqr)]/2 \). With this restriction on \( n \), \( \gamma \) in (2) is not greater than \( (p - 3)/2 \). The possible values of the \( \delta \)'s suggest the following notation for partitions of \( n \) in the form (2) [3]:

\[
\begin{align*}
\delta_1 = \delta_2 &= 0, & P_{1i} &= a_{1i} + a_{1i}pq + \beta_i pr + iqr \\
\delta_1 = \delta_2 &= 1, & P_{2i} &= a_{2i} + a_{2i}pq + \beta_2 pr + iqr + q + r \\
\delta_1 &= 0, \delta_2 &= 0, & P_{3i} &= a_{3i} + a_{3i}pq + \beta_3 pr + iqr + q \\
\delta_1 &= 0, \delta_2 &= 1, & P_{4i} &= a_{4i} + a_{4i}pq + \beta_4 pr + iqr + r
\end{align*}
\]

\( i = 0, 1, \cdots, (p - 3)/2. \)

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