We have

Theorem For $n \geq 1$,

$$(*) \qquad a_5(n-1) = \sum_{d \mid n} \left(\frac{d}{5}\right) \frac{n}{d}.$$

Corollary For $n \geq 1$,

$$a_5(n-1) = 5^c \prod_{i=1}^{s} \frac{p_i^{a_i+1} - 1}{p_i - 1} \prod_{j=1}^{t} \frac{q_j^{b_j+1} + (-1)^{b_j}}{q_j + 1}$$

where

$$n = 5^c p_1^{a_1} p_2^{a_2} \cdots p_s^{a_s} q_1^{b_1} q_2^{b_2} \cdots q_t^{b_t}$$

is prime factorization of n where
the p_i are primes $\equiv 1, 4 \pmod 5$ &
q_j are primes $\equiv 2, 3 \pmod 5$.

Proof This follows from the fact that the function on the rhs $(*)$ is a multiplicative function of n.

Corollary For $n \geq 0$,

$$a_5(5n+4) = a_5(n).$$

Proof $a_5(5n-1) = 5\, a_5(n-1)$ for $n \geq 1$.

So $a_5(5(n+1)-1) = 5a_5(n)$

& $a_5(5n+4) = 5a_5(n)$. □