now

$$E(q) = E(q^{25})\left[J_0(q^5) - q - \frac{q^2}{J_0(q^5)} \right]$$

~~$E(\zeta q) E(\zeta^2 q) E(\zeta^3 q) E(\zeta^4 q)$~~

$$= E(\zeta^j q) = E((q\zeta^j)^{25})\left[J_0((\zeta^j q)^5) - \zeta^j q - \frac{\zeta^{2j} q^2}{J((\zeta^j q)^5)} \right]$$

$$= E(q^{25})\left[J_0(q^5) - \zeta^j q - \frac{\zeta^{2j} q^2}{J_0(q^5)} \right]$$

since $\zeta^{5j} = (\zeta^5)^j = 1$.

$$E(\zeta q) E(\zeta^2 q) E(\zeta^3 q) E(\zeta^4 q)$$

$$= [E(q^{25})]^4 \left[J_0 - \zeta q - \frac{\zeta^2 q^2}{J_0} \right]$$

$$\times \left[J_0 - \zeta^2 q - \frac{\zeta^4 q^2}{J_0} \right] \times \left[J_0 - \zeta^3 q - \frac{\zeta^6 q^2}{J_0} \right]$$

$$\times \left[J_0 - \zeta^4 q - \frac{\zeta^8 q^2}{J_0} \right], \quad \text{where } J_0 = J_0(q^5)$$

$$= \Big[(J_0^4 - 3q^5 J_0^{-1}) + (6J_0^3 + 2q^6 J_0^{-2}) + (2q^2 J_0^2 - q^7 J_0^{-2}) + (3q^3 J_0 + q^8 J_0^{-4}) + 5q^4 \Big] [E(q^{25})]^4$$