```
Θ[K_] := Θ[K] = Module[{Cs, φ, n, A, Δ, G, ev, Θ},
  (* 01 *) {Cs, φ} = Rot[K]; n = Length[Cs];
  (* 02 *) A = IdentityMatrix[2 n + 1];
  (* 03 *) Cases[Cs, {s_, i_, j_} :> (A[[{i, j}, {i + 1, j + 1}]] += {{-T^s, T^s - 1}, {0, -1}})];
  (* 04 *) Δ = T^((-Total[φ] - Total[Cs[[All, 1]]])/2) Det[A];
  (* 05 *) G = Inverse[A];
  (* 06 *) ev[ℰ_] := Factor[ℰ /. g_ν_,α_,β_ :> (G[[α, β]] /. T -> T_ν)];
  (* 07 *) Θ = ev[∑_{k=1}^{n} F1[Cs[[k]]]];
  (* 08 *) Θ += ev[∑_{k1=1}^{n} ∑_{k2=1}^{n} F2[Cs[[k1]], Cs[[k2]]]];
  (* 09 *) Θ += ev[∑_{k=1}^{2 n} F3[φ[[k]], k]];
  (* 10 *) Factor@{Δ, (Δ /. T -> T1) (Δ /. T -> T2) (Δ /. T -> T3) Θ}
]
```