

Diagram (a) illustrates a hexagonal lattice structure. A central hexagon is highlighted in red, with vertices labeled 1 through 6 and edges labeled  $x$ ,  $y$ , and  $z$ . The central hexagon is labeled  $W_p$ . The surrounding lattice is composed of black lines and vertices.

b)

$Q^{ss'}_{ijk} =$

Diagrammatic expansion of the operator  $Q^{ss'}_{ijk}$  in terms of Pauli matrices  $U^x$ ,  $U^y$ , and  $U^z$ .

The diagram illustrates the decomposition of the 3-qubit GHZ state into a sum of tensor products of 2-qubit states and a 3-qubit state. The first part shows the GHZ state as a black circle with three gray lines, labeled  $|111\rangle$ . The second part shows the decomposition: a black circle with three black lines is defined as the sum of a black circle with two black lines and one gray line, and a black circle with three black lines, labeled  $:=$ . The third part shows the decomposition of the 2-qubit states: a black circle with two black lines and one gray line is defined as the sum of a black circle with two black lines and one gray line, and a black circle with two black lines and one gray line, labeled  $:=$ . The fourth part shows the decomposition of the 2-qubit states: a black circle with two black lines and one gray line is defined as the sum of a black circle with two black lines and one gray line, and a black circle with two black lines and one gray line, labeled  $:=$ .