Task 2.

In this task the size (42) of the circuit is bigger than what can be simulated even on the BlueQubit GPUs (36). However, some of the qubits in this circuit can be measured earlier and can be reused. There are 6 such qubits. So, I split the circuit into 2 pieces first. The first piece is the position before the measurements of these 5 quibits and the second piece is the circuit after the measurement. Then the fist part of the circuit is split into two pieces again. One piece contains all the qubits coupled to 6-measured qubits. There are less than 30 qubits in that part. This part is independent of the second part containing the rest of qubits. Now we can solve the part with measured qubits and get 6 bits of the desired bitstring. Then we can reorganize the circuit so that now we need only 36 qubits. This circuit can be executed with BlueQubit GPU device. This gives the rest 36 qubits of the bitstring.