**HLS Assignment Part 2 - Exam Preparation**

**Student Name:**

**Student ID Number:**

**To prepare for the HLS Exam solve the following HLS questions and take with you the printed/paper version of this document including your solutions of the HLS questions to your HLS exam.**

**HLS\_1 – ASAP scheduling**

**Consider** the **unscheduled DFG** given below:

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**Make the Minimum-Latency ASAP (As Soon As Possible) Schedule** of this DFG. Assume that each operation is executed in a single cycle. In your solution show the ASAP scheduled DFG.

**HLS\_1 – ASAP scheduling solution:**

**HLS\_2 – ALAP scheduling**

**Consider** the **unscheduled DFG** from the previous assignment HLS\_1.

**Make the Minimum-Latency ALAP (As Late As Possible) Schedule** of this DFG. Assume that each operation is executed in a single cycle. In your solution show the ALAP scheduled DFG.

**HLS\_2 – ALAP scheduling solution:**

**HLS\_3 – List scheduling single-cycle**

**Consider** the **unscheduled DFG** from the assignment HLS\_1 and **Resource Constraints**: 2 ALU, 2 MULT.

ALU (arithmetic-logic unit) implements: +, - and < operations. MULT implements: \* operation. **Assume that each operation is executed in a single cycle**.

**Perform** **Minimum-Latency Resource-Constrained List Scheduling** of this DFG.

**In your solution show**:

1. This DFG with its nodes labeled with priorities

2. List of candidate nodes and scheduled nodes for each cycle

3. Scheduled DFG

**HLS\_3 – List scheduling single-cycle solution:**

**HLS4 – operation binding**

**Consider** **the scheduled DFG** **being the result of the previous assignment HLS\_3 – List scheduling single-cycle**.

For this scheduled DFG, **find all minimum-resource operation bindings with resource sharing** through **using the operation compatibility graphs or conflict graphs and clique partitioning or coloring, correspondingly**.

**In your solution show**:

1. Compatibility or conflict graphs for all operation kinds

2. All minimum-resource operation bindings

**HLS4 – operation binding solution:**

**HLS\_5 – List scheduling multi-cycle**

**Consider** the **unscheduled DFG** from the assignment HLS\_1 and **Resource Constraints**: 2 ALU, 2 MULT.

ALU (arithmetic-logic unit) implements: +, - and < operations. MULT implements: \* operation. **Assume that each of the +, - and < operations is executed in a single cycle, but \* operation requires 2 cycles**.

**Perform** **Minimum-Latency Resource-Constrained List Scheduling** of this DFG.

**In your solution show**:

1. This DFG with its nodes labeled with priorities

2. List of candidate nodes and scheduled nodes for each cycle

3. Scheduled DFG

**HLS\_5 – List scheduling multi-cycle solution:**

**End of questions**