Course outline

How does an NPTEL online course work?

Prerequisite: Week 0

Week1: Introduction to C-based VLSI Design

Week2: C-Based VLSI Design: Basic Scheduling

Week3: C-Based VLSI Design: List Based Scheduling

Week 4: C-Based VLSI Design: Advanced Scheduling

Week 5: C-Based VLSI Design: Allocation and Binding

- Lec 1: Allocation and Binding Problem Formulation
- Lecture Note for Lec1
- Lec 2: Left Edge Algorithm
- Lecture Note for Lec2
- Lec 3: ILP Based Formulation
- Lecture Note for Lec3
- Lec 4: Allocation and Binding of Hierarchical Graph
- Lecture Note for Lec4
- Quiz: Week 5: Assignment 5
- Week 5: Feedback Form
- Solution: Assignment 5

Week 6: C-Based VLSI Design: Allocation, Binding, Data-path and Controller Generation

Week 7: C-Based VLSI Design: Efficient Synthesis of C Code

Week 8: C-Based VLSI Design: Hardware Efficient C Coding

Week 9: C-Based VLSI Design: Impact of Compiler Optimizations in Hardware

Week 10: Verification of High-level Synthesis

Week 11: Securing Design with High-level Synthesis

Week 12: Introduction to EDA and Recent Advances in C-Based VLSI Design

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# Week 5: Assignment 5

**The due date for submitting this assignment has passed.**

**Due on 2021-09-01, 23:59 IST.**

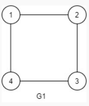
**As per our records you have not submitted this assignment.**

1) In allocation and binding which of the following option is correct? *1 point*

- Variables are mapped into FUs and operations are mapped into registers
- Both variables and operations are mapped into FUs
- Both variables and operations are mapped into registers
- Variables are mapped into registers and operations are mapped into FUs

No, the answer is incorrect.
Score: 0
Accepted Answers:
*Variables are mapped into registers and operations are mapped into FUs*

2) If G1 is a compatibility graph of operations 1, 2, 3 and 4. which of the following is false? *1 point*

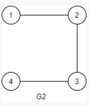


G1

- Operations 2 and 3 are scheduled in the same time stamp
- Operations 2 and 4 are scheduled in the same time stamp
- Operations 1 and 3 are scheduled in the same time stamp
- Operations 1 and 4 are not scheduled in the same time stamp

No, the answer is incorrect.
Score: 0
Accepted Answers:
*Operations 2 and 3 are scheduled in the same time stamp*

3) What is chromatic number for the conflict graph in G2? *1 point*

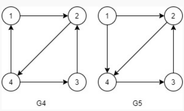


G2

- 1
- 2
- 3
- 4

No, the answer is incorrect.
Score: 0
Accepted Answers:
*2*

4) Which one of the following options is correct for the above graphs G4 and G5? *1 point*



G4 G5

- Both G4 and G5 are comparability graphs
- G4 is a comparability graph but G5 is not
- G5 is a comparability graph but G4 is not
- Neither G4 nor G5 is a comparability graph

No, the answer is incorrect.
Score: 0
Accepted Answers:
*Neither G4 nor G5 is a comparability graph*

5) What is the complexity of the left edge algorithm if 'n' is the number of nodes in the interval graph? *1 point*

- O(n)
- O(log n)
- O(n log n)
- $O(n^2 \log n)$

No, the answer is incorrect.
Score: 0
Accepted Answers:
*O(n log n)*

6) What is the minimum number of colours required for the interval graph in Figure 1 using left edge algorithm? *1 point*

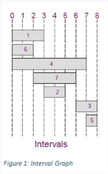


*Figure 1: Interval Graph*

- 2
- 3
- 4
- 5

No, the answer is incorrect.
Score: 0
Accepted Answers:
*3*

7) What is the sequence of ordering of operations in the interval graph in Figure 1? *1 point*

- 6, 1, 4, 2, 7, 5, 3
- 1, 6, 4, 7, 2, 3, 5
- 5, 3, 4, 7, 2, 1, 6
- 4, 6, 1, 7, 2, 5, 3

No, the answer is incorrect.
Score: 0
Accepted Answers:
*1, 6, 4, 7, 2, 3, 5*

8) Let function a () is called two times and is executing as in Figure 2. Which one of the following is correct? *1 point*

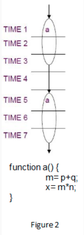


Figure 2

S1: both the multiplication operations of function a () in two function calls can be executed using one multiplier.

S2: both the addition operations of function a () in two function calls cannot be executed using one adder.

- Only S1 is correct
- Only S2 is correct
- Both S1 and S2 are correct
- Both are incorrect

No, the answer is incorrect.
Score: 0
Accepted Answers:
*Only S1 is correct*

9) Which one of the following is False for the scheduling in Figure 3? *1 point*

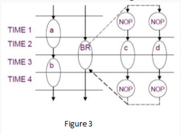


Figure 3

- The conflict graph of the scheduling has an edge from node a and c
- The conflict graph of the scheduling has an edge from node a and d
- The conflict graph of the scheduling has an edge from node c and d
- The conflict graph of the scheduling has an edge from node b and c

No, the answer is incorrect.
Score: 0
Accepted Answers:
*The conflict graph of the scheduling has an edge from node c and d*

10) Which of the following statements are correct in allocation and binding? *1 point*

S1: Functional unit binding problem can be mapped to graph colouring problem of conflict graph.

S2: Functional unit binding problem can be mapped to graph colouring problem of compatibility graph.

S3: Functional unit binding problem can be mapped to clique cover problem of compatibility graph.

S4: Functional unit binding problem can be mapped to clique cover problem of conflict graph.

- Both S1 and S3
- Both S1 and S4
- Both S2 and S3
- Both S2 and S4

No, the answer is incorrect.
Score: 0
Accepted Answers:
*Both S1 and S3*