Quiz 4: Solutions

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Question 1: Reconfigurable Computing [10 Total]

#1 A reconfigurable computer is one that can change its hardware data paths and control flows by software control. These changes could be controlled at compile time, dynamically during runtime, or both.
[4]

#2 Reconfigurable computing is suited to high-speed stream-based processing where the pipeline processing stages are specialised and different from one another (e.g. one stage doing an FFT and the next implementing an array of comparators, etc.). A good example is MPEG decoding for multi-channel television (DSTV decoder, for instance).

GPU's are good at doing a lot of the same thing in parallel. It is difficult to fit a heterogeneous pipeline onto a GPU architecture.
[6]

Question 2: Portability [6 Total]

#1 (b) It can be compiled and run, with little or no alteration, on another computer system.

#2 Advantages:

- Less time spent doing code development.

- Less time spent adapting code to new platforms.

- Libraries are generally used by a large group of people, so they mature quickly into reliable versions.

Disadvantages:

- Dependency on the third party developer.

- Bugs in the library are outside the control of the developer.

- The library might not do exactly what the developer want, which leads to non-optimal code.

- Not all platforms are supported.

[4]

Question 3: Parallel and Distributed Systems [4 Total]

#1

$$P = \frac{1}{S + \frac{1-S}{N}} = \frac{1}{0.15 + \frac{1-0.15}{12}} = 4.528$$

[2]

#2 (b) RMI = Request Method Indirectly.

[1]

#3 The correct definition is "Remote Method Invocation".

[1]
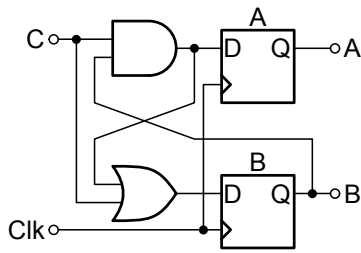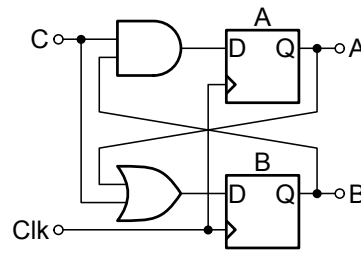
#4 (c) ORB

Question 4: Verilog   [10 Total]

#1

Option A   Option B   [4]

#2 With non-blocking assignments, all the right-hand-side expressions are evaluated independently. The order in which the assignments are specified does not matter. The assignments are executed, at the same time, at the time of the triggering event.

With blocking assignments, the assignments are still executed, at the same time, at the time of the triggering event, but the expressions are evaluated sequentially. The order in which the assignments are specified matters.   [2]
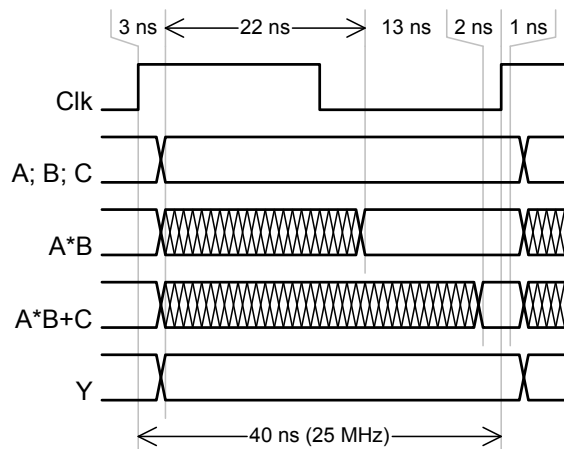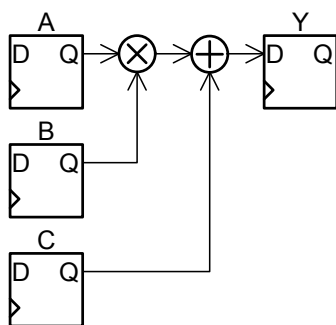
#3
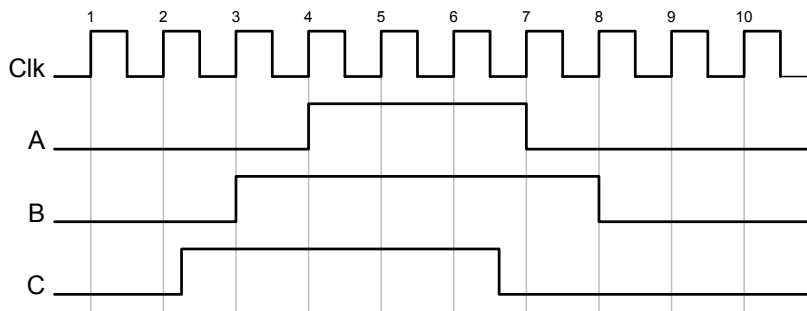
[4]

Question 5: Timing Calculations   [5 Total]

[5]