Module 8: Digital System Design
Class 36: ASM Chart, Shift-and-Add Multiplier
tRAT
(6 questions in total)

1. In an ASM chart, what is the shape of a state box?
   A. Circle
   B. Rectangle
   C. Diamond
   D. Oval

2. In an ASM chart, what is the shape of a decision box?
   A. Circle
   B. Rectangle
   C. Diamond
   D. Oval

3. In an ASM chart, what is the shape of a conditional output box?
   A. Circle
   B. Rectangle
   C. Diamond
   D. Oval

4. Which of the following statements is incorrect?
   A. For a Moore-type FSM, the outputs are specified inside the state boxes.
   B. For a Mealy-type FSM, the outputs are specified inside the conditional output boxes.
   C. An ASM chart is similar to a traditional flowchart, but an ASM chart includes timing information.
   D. ASM charts are more powerful than state diagrams. Some complicated FSMs can only be described by ASM charts. They cannot be described by state diagrams.

5. For the shift-and-add multiplier design in Chapter 7.4, which of the following statements is incorrect?
   A. Register A is a $2n$-bit left-shift register.
   B. Register B is a n-bit right-shift register.
   C. Register P is a $2n$-bit right-shift register.
   D. The value $P + A$ is computed in every iteration, but it may or may be written back to register P depending on the value of the LSB of register B.

6. For the shift-and-add multiplier design in Chapter 7.4, how does the circuit determine if the computation has been done/completed (i.e., the Done signal should be generated)? Note that n is the number of bits in the given operands.
   A. There is a counter in the datapath circuit to keep track of the loop index i. When i becomes n, the computation is done.
   B. There is a counter in the datapath circuit to keep track of the loop index i. When i becomes $n - 1$, the computation is done.
   C. There is a counter in the control circuit to keep track of the loop index i. When i becomes n, the computation is done.
   D. The computation is done when all the bits of 1 in the multiplier has been shifted out of the register B.